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**SUSTAINABILITY OF ISLAMIC BANKS: A COMPARATIVE
ANALYSIS BETWEEN GCC AND NON-GCC COUNTRIES**

SIRAJU ALIYU



**DOCTOR OF PHILOSOPHY
UNIVERSITI UTARA MALAYSIA**

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**SUSTAINABILITY OF ISLAMIC BANKS: A COMPARATIVE
ANALYSIS BETWEEN GCC AND NON-GCC COUNTRIES**

**By
SIRAJO ALIYU**



UUM
Universiti Utara Malaysia

**Thesis Submitted to
Othman Yeop Abdullah Graduate School of Business,
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in Fulfillment of the Requirement for the Degree of Doctor of Philosophy**



Pusat Pengajian Perniagaan Islam
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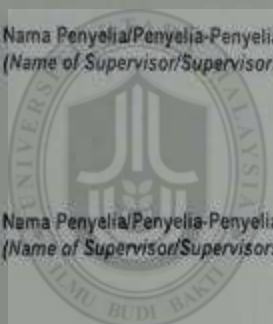
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Abstrak

Kajian ini bertujuan untuk mengkaji kelestarian perbankan Islam daripada perspektif institusi dan kebajikan di negara-negara *Gulf Cooperation Council* (GCC) dan negara-negara bukan GCC. Melalui pendekatan institusi, kajian ini mengkaji tahap dan darjah kelangsungan perbankan Islam serta menilai hubungan dinamik jangka pendek dan jangka panjang kesolvenan (kemampuan membayar hutang) perbankan dan operasi sendiri. Pendekatan kebajikan mengkaji kesan dinamik peruntukan modal bank-bank Islam dan keputusan kewangan terhadap kesejahteraan masyarakat melalui indeks jangkauan dan *maqasid* syariah. Analisis bukan parametrik, separa parametrik, parametrik, dan kelangsungan panel telah digunakan untuk meramalkemandirian bank-bank Islam di negara-negara GCC dan negara-negara bukan GCC. Analisis panel integrasi bersama agregat dan analisis data banknegara juga telah digunakan untuk menganggarkan jangka masa panjang pergerakan bersama dan hubungan dinamik antara komponen kelestarian. Kajian ini menggunakan data ketidakseimbangan kewangan dan ekonomi makro antara tahun 1987 dan 2014. Secara umumnya, analisis bukan parametrik mendedahkan bahawa bank-bank Islam mempunyai daya kelangsungan yang tinggi, manakala bank-bank Islam di negara-negara bukan GCC mencatatkan kadar kelangsungan yang lebih rendah daripada bank-bank di negara-negara GCC. Tambahan lagi, analisis masa pemisah meramalkan 3.6 peratus kemungkinan kegagalan berulang bagi sampel keseluruhan bank. Analisis kelangsungan menunjukkan hasil yang sama tentang kelangsungan bank-bank Islam. Walau bagaimanapun, analisis negara agregat mendapati bahawa komponen kelestarian telah berkointegrasi di kedua-dua rantau kecuali jangkauan di negara-negara bukan GCC. Sebaliknya, analisis khusus banknegara mendedahkan pergerakan bersama komponen kelestarian kecuali operasi sendiri di negara-negara bukan GCC. Akhir sekali, keputusan analisis dinamik mendedahkan bahawa komponen institusi mempengaruhi *maqasid* syariah di negara-negara GCC dan tidak di negara-negara bukan GCC. Penemuan ini menyarankan agar bank-bank Islam di GCC lebih lestari daripada bank-bank di negara bukan GCC. Bank-bank di negara-negara bukan GCC perlu memberi fokus kepada operasi keperluan sendiri dan jangkauan untuk meningkatkan kelestarian mereka.

Kata kunci: kelestarian, bank-bank Islam, analisis kelangsungan, panel kointegrasi, analisis dinamik

Abstract

This study aimed to examine Islamic banking sustainability from institutional and welfarist perspectives within the Gulf Cooperation Council (GCC) and the Non-Gulf Cooperation Council (Non-GCC) countries. From the institutional approach, the study investigated the levels and extent of Islamic banking survival and assessed the short- and long-run dynamic relationships of banking solvency and operational self-sufficiency. The welfarist approach explores the dynamic impacts of the Islamic banks' capital allocation and financial decisions on societal well-being through the outreach and *maqasid* sharia indexes. Non-parametric, semi-parametric, parametric, and panel survival analyses were employed to predict the survivability of Islamic banks in the GCC and Non-GCC countries. Panel cointegration analyses of the aggregate and bank-country data were also used to estimate the long-run co-movement and dynamic relationships among the sustainability components. It utilized unbalanced financial and macroeconomic data between 1987 and 2014. In general, the non-parametric analysis revealed that Islamic banks had a higher survival rate, whereas Islamic banks in the Non-GCC countries recorded a lower survival rate than the banks in the GCC countries. Additionally, the split time analysis predicted 3.6 percent failure recurrence possibilities of the sample of all the banks. The survival analyses presented similar outcomes of the Islamic banks' survivability. However, the country aggregate analysis found that the sustainability components were cointegrated in the two regions except for outreach in Non-GCC countries. On the other hand, the bank-country specific analysis revealed the co-movement of the sustainability components except for operational self-sufficiency in the Non-GCC countries. Finally, the results of the dynamic analyses revealed that institutional components influenced *maqasid* sharia in the GCC countries and not in the Non-GCC countries. These findings suggest that Islamic banks in GCC are more sustainable than those in Non-GCC countries. Banks in Non-GCC countries should focus on operational self-sufficiency and outreach to enhance their sustainability.

Keywords: Sustainability, Islamic banks, survival analysis, panel cointegration, dynamic analysis

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List of papers

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Confereneces

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Aliyu, Sirajo, and Rosylin Mohd Yusof. "*Profitability and Cost-Efficiency of Islamic Banks: New Evidence from Efficiency Experiment.*" A paper presented at the 1st International Conference on Management and Communication. August 20-21, 2016, Malaysia.

Aliyu, Sirajo, Rosylin Mohd Yusof, and Nasri Naiimi. "*The role of Moral Transaction Mode for Sustainability of Banking Business.*" A paper presented at the International Conference on Governance and Public Affairs-UUM. October 5-6, 2016, Malaysia.

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List of Abbreviations

2LS	2 Least Square
ADF	Augmented Dickey Fuller
AFT	Accelerated Failure Time
AIC	Akaike Information Criterion
BE	Business Ethics
BIC	Bayesian Information Criterion
CAMEL	Capital Adequacy, Asset quality, Management efficiency, Earning power and Liquidity
CAR	Capital to Asset ratio
CBN	Central Bank of Nigeria
CBs	Conventional Banks
CCA	Caucasus and Central Asia
CDF	Cumulative Density Function
CEO	Chief Executive Officer
CFL	Capital Funds to Liabilities
CIR	Cost to Income Ratio,
CISL	Cambridge Institute of Sustainability Leadership
CSR	Corporate Social Responsibility
DEA	Data Envelopment Analysis
EAP	East Asia Pacific
ECA	Eastern Europe and Central Asia
ENL	Equity to Net Loans
EQTA	Equity to Total Asset
ES	Environmental Sustainability
FSS	Financial Self-sufficiency
GABV	Global Alliance for Banks of value
GCC	Gulf Cooperation Council
GDP	Gross Domestic Product
GDPPC	Per Capita GDP
GFD	Global Financial Development
GLM	Generalized Linear Model
GMM	Generalized Method of Moments
GNP	Gross National Product
IBIS	Islamic Banks Information System
IBs	Islamic Banks
IFSB	Islamic Financial Service Board
IIFS	Institutions offering Islamic financial services
IMF	International Monetary fund
IMFIs	Islamic Micro Finance Institutions

INF	Inflation
IPS	Im, Pesaran & Shin
IRF	Impulse Response Function
IRR	Investment Risk Reserve
IRTI	Islamic Research Training Institute
IsDB	Islamic Development Bank
ISRA	International Shari'ah Research Academy for Islamic Finance
IV	Instrumental Variable
LADSTF	Liquid Asset to Deposit and Short term Funding
LCR	Liquid Asset Ratio
LLC	Levin, Lin & Chu
LLI	Loans Loss Reserves to Impaired Loans
MAIC	Modified Akaike Information Criteria
MDGs	Millennium Development Goals
MENA	Middle East and North Africa
MFI	Microfinance Institutions
MI	Maqasid Index
MM	Modigliani & Miller
NGOs	Non-Governmental Organizations
NI	Net Income
NIEA	Non-interest Expenses to Average Assets
NLTA	Net Loans to Total Assets
Non-GCC	Non- Gulf Cooperation Council
OIC	Organization of Islamic Cooperation
OLS	Ordinary Least Squares
ONIL	Non-interest Bearing Liabilities
OOIA	Other Operating Income to Average Asset
OSS	Operational Self-Sufficiency
OUT	Outreach
PBS	Positive Behavioural Studies
PDF	Probability Density Function
PEN	Positive Ethical Theory
PER	Profit Equalization Reserve
POB	Positive Organizational Behaviour
POE	Positive Organizational Ethics
POS	Positive Organizational Scholarship
PP	Positive Psychology
PwC	Pricewaterhousecoopers
ROA	Return on Asset
ROAA	Return on Average Asset
SA	South Asia
SD	Sustainable Development

SDGs	Sustainable Development Goals
SDI	Subsidy Dependence Index
SOL	Solvency
SRI	Socially Responsible Investment
SSA	Sub-Saharan Africa
SVAR	Structural Vector Autoregressive
TCR	Total Capital Ratio
UAE	United Arab Emirates
UNEP FI	United Nations Environment Programs Finance Initiatives
UN-ESCAP	United Nations Economic and Social Commission for Asia and the Pacific
VAR	Vector Autoregressive
VDC	Variance Decomposition
WCED	World Commission on Environment and Development



CHAPTER ONE

INTRODUCTION

1.1 Introduction

This chapter discusses the broad introduction of the thesis, which begins with the background and motivation of the study. The background linked the concept of banking sustainability with Islamic banking models and highlighted its diffusion to the geographical regions of the study. Consequently, the entire motivation for this study emerged from the theoretical, methodological and practical gaps which are immensely elaborated and splitted into subsequent sections. Furthermore, the following sections stress on the statement of the problem, research question, and objectives, scope, and outline of the study.

1.2 Background of the Study

The uncompromising present and future generations' social, economic and environmental aspect of life is regarded as the Brundland (1987) concept of sustainability. The general concept of sustainability is latterly related to various segments of life such as energy, transitional development, fiscal balances, education, economy, and banking and finance among others. In a specific context, recent financial crisis necessitates banks and other financial institutions to envision for long-term sustainability rather than mere profitability attainment (Banerjee, & Velamuri, 2015). Scholars have divergently viewed sustainability in banking and finance from two perspectives; the institutional and welfarist approach (Robinson, 2001; Hermes, Lensink, & Meesters, 2011; Nurmakhanova, Kretzschmar, & Fedhila, 2015; Mia, & Chandran, 2015; Bhanot, & Bapat, 2015). The institutional approach

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Appendix A

Maqasid index

Year	Educating individual							Establishing Justice							Public Interest						MI						
	OW	EDTE	E1	RETE	E2	TRTE	E3	PETE	E4	M.Total	OW	PENIV	E5	FNTI	E6	IFTI	E7	M.Total	OW	NITA		E8	ZTA	E9	INETI	E10	M.Total
1993	0.3	X	0.24	X	0.27	X	0.26	X	0.23	#VALUE!	0.41	X	0.3	X	0.32	X	0.38	#VALUE!	0.29	X	0.33	X	0.3	X	0.37	#VALUE!	#VALUE!
1994	0.3	X	0.24	X	0.27	X	0.26	X	0.23	#VALUE!	0.41	X	0.3	X	0.32	X	0.38	#VALUE!	0.29	X	0.33	X	0.3	X	0.37	#VALUE!	#VALUE!
1995	0.3	X	0.24	X	0.27	X	0.26	X	0.23	#VALUE!	0.41	X	0.3	X	0.32	X	0.38	#VALUE!	0.29	X	0.33	X	0.3	X	0.37	#VALUE!	#VALUE!
1996	0.3	X	0.24	X	0.27	X	0.26	X	0.23	#VALUE!	0.41	X	0.3	X	0.32	X	0.38	#VALUE!	0.29	X	0.33	X	0.3	X	0.37	#VALUE!	#VALUE!
1997	0.3	X	0.24	X	0.27	X	0.26	X	0.23	#VALUE!	0.41	X	0.3	X	0.32	X	0.38	#VALUE!	0.29	X	0.33	X	0.3	X	0.37	#VALUE!	#VALUE!
1998	0.3	X	0.24	X	0.27	X	0.26	X	0.23	#VALUE!	0.41	X	0.3	X	0.32	X	0.38	#VALUE!	0.29	X	0.33	X	0.3	X	0.37	#VALUE!	#VALUE!
1999	0.3	X	0.24	X	0.27	X	0.26	X	0.23	#VALUE!	0.41	X	0.3	X	0.32	X	0.38	#VALUE!	0.29	X	0.33	X	0.3	X	0.37	#VALUE!	#VALUE!
2000	0.3	X	0.24	X	0.27	X	0.26	X	0.23	#VALUE!	0.41	X	0.3	X	0.32	X	0.38	#VALUE!	0.29	X	0.33	X	0.3	X	0.37	#VALUE!	#VALUE!
2001	0.3	X	0.24	X	0.27	X	0.26	X	0.23	#VALUE!	0.41	X	0.3	X	0.32	X	0.38	#VALUE!	0.29	X	0.33	X	0.3	X	0.37	#VALUE!	#VALUE!
2002	0.3	X	0.24	X	0.27	X	0.26	X	0.23	#VALUE!	0.41	X	0.3	X	0.32	X	0.38	#VALUE!	0.29	X	0.33	X	0.3	X	0.37	#VALUE!	#VALUE!
2003	0.3	X	0.24	X	0.27	X	0.26	X	0.23	#VALUE!	0.41	X	0.3	X	0.32	X	0.38	#VALUE!	0.29	X	0.33	X	0.3	X	0.37	#VALUE!	#VALUE!
2004	0.3	X	0.24	X	0.27	X	0.26	X	0.23	#VALUE!	0.41	X	0.3	X	0.32	X	0.38	#VALUE!	0.29	X	0.33	X	0.3	X	0.37	#VALUE!	#VALUE!
2005	0.3	X	0.24	X	0.27	X	0.26	X	0.23	#VALUE!	0.41	X	0.3	X	0.32	X	0.38	#VALUE!	0.29	X	0.33	X	0.3	X	0.37	#VALUE!	#VALUE!
2006	0.3	X	0.24	X	0.27	X	0.26	X	0.23	#VALUE!	0.41	X	0.3	X	0.32	X	0.38	#VALUE!	0.29	X	0.33	X	0.3	X	0.37	#VALUE!	#VALUE!
2007	0.3	X	0.24	X	0.27	X	0.26	X	0.23	#VALUE!	0.41	X	0.3	X	0.32	X	0.38	#VALUE!	0.29	X	0.33	X	0.3	X	0.37	#VALUE!	#VALUE!
2008	0.3	X	0.24	X	0.27	X	0.26	X	0.23	#VALUE!	0.41	X	0.3	X	0.32	X	0.38	#VALUE!	0.29	X	0.33	X	0.3	X	0.37	#VALUE!	#VALUE!
2009	0.3	X	0.24	X	0.27	X	0.26	X	0.23	#VALUE!	0.41	X	0.3	X	0.32	X	0.38	#VALUE!	0.29	X	0.33	X	0.3	X	0.37	#VALUE!	#VALUE!
2010	0.3	X	0.24	X	0.27	X	0.26	X	0.23	#VALUE!	0.41	X	0.3	X	0.32	X	0.38	#VALUE!	0.29	X	0.33	X	0.3	X	0.37	#VALUE!	#VALUE!
2011	0.3	X	0.24	X	0.27	X	0.26	X	0.23	#VALUE!	0.41	X	0.3	X	0.32	X	0.38	#VALUE!	0.29	X	0.33	X	0.3	X	0.37	#VALUE!	#VALUE!
2012	0.3	X	0.24	X	0.27	X	0.26	X	0.23	#VALUE!	0.41	X	0.3	X	0.32	X	0.38	#VALUE!	0.29	X	0.33	X	0.3	X	0.37	#VALUE!	#VALUE!

Appendix B

Survival and Hazard function (GCC and Non-GCC)

Time	Beg. Total	Fail	Net lost	Survivor function	Std. Error	[95% Conf. Int.]	
NGCC							
1	113	1	0	0.9912	0.0088	0.9388	0.9987
2	112	1	0	0.9823	0.0124	0.9311	0.9955
4	111	0	1	0.9823	0.0124	0.9311	0.9955
5	110	3	5	0.9555	0.0194	0.8964	0.9812
6	102	1	0	0.9461	0.0214	0.884	0.9754
7	101	0	3	0.9461	0.0214	0.884	0.9754
8	98	0	3	0.9461	0.0214	0.884	0.9754
9	95	2	4	0.9262	0.0252	0.8577	0.9625
10	89	1	10	0.9158	0.0269	0.8442	0.9554
11	78	0	3	0.9158	0.0269	0.8442	0.9554
12	75	1	3	0.9036	0.0292	0.8274	0.9472
13	71	0	2	0.9036	0.0292	0.8274	0.9472
14	69	0	3	0.9036	0.0292	0.8274	0.9472
15	66	0	2	0.9036	0.0292	0.8274	0.9472
16	64	0	6	0.9036	0.0292	0.8274	0.9472
17	58	1	2	0.888	0.0326	0.8044	0.9373
18	55	0	3	0.888	0.0326	0.8044	0.9373
19	52	2	1	0.8539	0.0393	0.7561	0.9146
20	49	0	5	0.8539	0.0393	0.7561	0.9146
21	44	0	1	0.8539	0.0393	0.7561	0.9146
22	43	0	3	0.8539	0.0393	0.7561	0.9146
23	40	0	1	0.8539	0.0393	0.7561	0.9146
24	39	1	4	0.832	0.044	0.724	0.9005
25	34	0	1	0.832	0.044	0.724	0.9005
26	33	0	1	0.832	0.044	0.724	0.9005
28	32	0	2	0.832	0.044	0.724	0.9005
29	30	1	1	0.8042	0.0505	0.6817	0.8835
30	28	1	4	0.7755	0.0563	0.641	0.8648
31	23	0	2	0.7755	0.0563	0.641	0.8648
32	21	0	3	0.7755	0.0563	0.641	0.8648
33	18	0	1	0.7755	0.0563	0.641	0.8648
35	17	0	5	0.7755	0.0563	0.641	0.8648
37	12	0	1	0.7755	0.0563	0.641	0.8648
38	11	0	2	0.7755	0.0563	0.641	0.8648

40	9	0	2	0.7755	0.0563	0.641	0.8648
43	7	0	1	0.7755	0.0563	0.641	0.8648
50	6	1	0	0.6463	0.127	0.3483	0.8347
61	5	0	1	0.6463	0.127	0.3483	0.8347
62	4	0	1	0.6463	0.127	0.3483	0.8347
80	3	1	1	0.4308	0.1952	0.0892	0.7458
90	1	0	1	0.4308	0.1952	0.0892	0.7458
GCC							
5	57	0	1	1	.	.	.
6	56	0	1	1	.	.	.
7	55	1	4	0.9818	0.018	0.8779	0.9974
8	50	1	4	0.9622	0.0263	0.8569	0.9904
9	45	0	5	0.9622	0.0263	0.8569	0.9904
10	40	0	1	0.9622	0.0263	0.8569	0.9904
11	39	2	5	0.9128	0.0421	0.782	0.9668
12	32	1	1	0.8843	0.0495	0.7406	0.9509
13	30	0	1	0.8843	0.0495	0.7406	0.9509
15	29	1	0	0.8538	0.0564	0.6985	0.9328
16	28	1	2	0.8233	0.0621	0.6597	0.9132
18	25	0	3	0.8233	0.0621	0.6597	0.9132
19	22	2	1	0.7485	0.0757	0.563	0.8641
24	19	0	1	0.7485	0.0757	0.563	0.8641
28	18	1	1	0.7069	0.0822	0.5123	0.8354
31	16	1	1	0.6627	0.0881	0.4607	0.8038
32	14	0	1	0.6627	0.0881	0.4607	0.8038
33	13	0	1	0.6627	0.0881	0.4607	0.8038
35	12	0	1	0.6627	0.0881	0.4607	0.8038
36	11	0	1	0.6627	0.0881	0.4607	0.8038
38	10	0	2	0.6627	0.0881	0.4607	0.8038
39	8	0	1	0.6627	0.0881	0.4607	0.8038
40	7	0	4	0.6627	0.0881	0.4607	0.8038
42	3	0	1	0.6627	0.0881	0.4607	0.8038
43	2	0	1	0.6627	0.0881	0.4607	0.8038
57	1	0	1	0.6627	0.0881	0.4607	0.8038

Time	Beg. Total	Fail	Net lost	Nelson- Aalen Cum. Haz.	Std. Error	[95% Conf. Int.]	
NGCC							
1	113	1	0	0.0088	0.0088	0.0012	0.0628
2	112	1	0	0.0178	0.0126	0.0044	0.0711
4	111	0	1	0.0178	0.0126	0.0044	0.0711
5	110	3	5	0.0451	0.0201	0.0188	0.1082
6	102	1	0	0.0549	0.0224	0.0246	0.1222
7	101	0	3	0.0549	0.0224	0.0246	0.1222
8	98	0	3	0.0549	0.0224	0.0246	0.1222
9	95	2	4	0.0759	0.0269	0.0379	0.152
10	89	1	10	0.0871	0.0292	0.0452	0.1679
11	78	0	3	0.0871	0.0292	0.0452	0.1679
12	75	1	3	0.1005	0.0321	0.0538	0.1878
13	71	0	2	0.1005	0.0321	0.0538	0.1878
14	69	0	3	0.1005	0.0321	0.0538	0.1878
15	66	0	2	0.1005	0.0321	0.0538	0.1878
16	64	0	6	0.1005	0.0321	0.0538	0.1878
17	58	1	2	0.1177	0.0364	0.0642	0.2158
18	55	0	3	0.1177	0.0364	0.0642	0.2158
19	52	2	1	0.1562	0.0454	0.0883	0.2762
20	49	0	5	0.1562	0.0454	0.0883	0.2762
21	44	0	1	0.1562	0.0454	0.0883	0.2762
22	43	0	3	0.1562	0.0454	0.0883	0.2762
23	40	0	1	0.1562	0.0454	0.0883	0.2762
24	39	1	4	0.1818	0.0522	0.1036	0.3191
25	34	0	1	0.1818	0.0522	0.1036	0.3191
26	33	0	1	0.1818	0.0522	0.1036	0.3191
28	32	0	2	0.1818	0.0522	0.1036	0.3191
29	30	1	1	0.2152	0.0619	0.1224	0.3782
30	28	1	4	0.2509	0.0715	0.1435	0.4385
31	23	0	2	0.2509	0.0715	0.1435	0.4385
32	21	0	3	0.2509	0.0715	0.1435	0.4385
33	18	0	1	0.2509	0.0715	0.1435	0.4385
35	17	0	5	0.2509	0.0715	0.1435	0.4385
37	12	0	1	0.2509	0.0715	0.1435	0.4385
38	11	0	2	0.2509	0.0715	0.1435	0.4385
40	9	0	2	0.2509	0.0715	0.1435	0.4385

43	7	0	1	0.2509	0.0715	0.1435	0.4385
50	6	1	0	0.4175	0.1813	0.1782	0.9781
61	5	0	1	0.4175	0.1813	0.1782	0.9781
62	4	0	1	0.4175	0.1813	0.1782	0.9781
80	3	1	1	0.7509	0.3795	0.2789	2.0218
90	1	0	1	0.7509	0.3795	0.2789	2.0218
GCC							
5	57	0	1	0	0	.	.
6	56	0	1	0	0	.	.
7	55	1	4	0.0182	0.0182	0.0026	0.1291
8	50	1	4	0.0382	0.027	0.0095	0.1529
9	45	0	5	0.0382	0.027	0.0095	0.1529
10	40	0	1	0.0382	0.027	0.0095	0.1529
11	39	2	5	0.0895	0.0452	0.0332	0.241
12	32	1	1	0.1207	0.055	0.0494	0.2947
13	30	0	1	0.1207	0.055	0.0494	0.2947
15	29	1	0	0.1552	0.0649	0.0684	0.3522
16	28	1	2	0.1909	0.0741	0.0892	0.4084
18	25	0	3	0.1909	0.0741	0.0892	0.4084
19	22	2	1	0.2818	0.0981	0.1425	0.5574
24	19	0	1	0.2818	0.0981	0.1425	0.5574
28	18	1	1	0.3374	0.1127	0.1753	0.6494
31	16	1	1	0.3999	0.1289	0.2126	0.7521
32	14	0	1	0.3999	0.1289	0.2126	0.7521
33	13	0	1	0.3999	0.1289	0.2126	0.7521
35	12	0	1	0.3999	0.1289	0.2126	0.7521
36	11	0	1	0.3999	0.1289	0.2126	0.7521
38	10	0	2	0.3999	0.1289	0.2126	0.7521
39	8	0	1	0.3999	0.1289	0.2126	0.7521
40	7	0	4	0.3999	0.1289	0.2126	0.7521
42	3	0	1	0.3999	0.1289	0.2126	0.7521
43	2	0	1	0.3999	0.1289	0.2126	0.7521
57	1	0	1	0.3999	0.1289	0.2126	0.7521

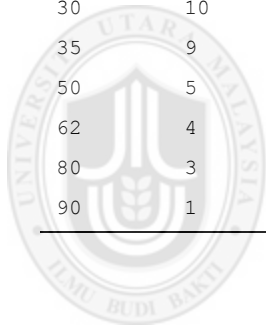
Appendix C

Survival and Hazard function (Four regions)

Time	Beg. Total	Fail	Net lost	Survivor function	Std. Error	[95% Conf. Int.]	
GCC							
5	57	0	1	1	.	.	.
6	56	0	1	1	.	.	.
7	55	1	4	0.9818	0.018	0.8779	0.9974
8	50	1	4	0.9622	0.0263	0.8569	0.9904
9	45	0	5	0.9622	0.0263	0.8569	0.9904
10	40	0	1	0.9622	0.0263	0.8569	0.9904
11	39	2	5	0.9128	0.0421	0.782	0.9668
12	32	1	1	0.8843	0.0495	0.7406	0.9509
13	30	0	1	0.8843	0.0495	0.7406	0.9509
15	29	1	0	0.8538	0.0564	0.6985	0.9328
16	28	1	2	0.8233	0.0621	0.6597	0.9132
18	25	0	3	0.8233	0.0621	0.6597	0.9132
19	22	2	1	0.7485	0.0757	0.563	0.8641
24	19	0	1	0.7485	0.0757	0.563	0.8641
28	18	1	1	0.7069	0.0822	0.5123	0.8354
31	16	1	1	0.6627	0.0881	0.4607	0.8038
32	14	0	1	0.6627	0.0881	0.4607	0.8038
33	13	0	1	0.6627	0.0881	0.4607	0.8038
35	12	0	1	0.6627	0.0881	0.4607	0.8038
36	11	0	1	0.6627	0.0881	0.4607	0.8038
38	10	0	2	0.6627	0.0881	0.4607	0.8038
39	8	0	1	0.6627	0.0881	0.4607	0.8038
40	7	0	4	0.6627	0.0881	0.4607	0.8038
42	3	0	1	0.6627	0.0881	0.4607	0.8038
43	2	0	1	0.6627	0.0881	0.4607	0.8038
57	1	0	1	0.6627	0.0881	0.4607	0.8038
Asia							
4	50	0	1	1	.	.	.
5	49	1	4	0.9796	0.0202	0.8638	0.9971
7	44	0	2	0.9796	0.0202	0.8638	0.9971
8	42	0	3	0.9796	0.0202	0.8638	0.9971
9	39	0	1	0.9796	0.0202	0.8638	0.9971

10	38	0	7	0.9796	0.0202	0.8638	0.9971
12	31	1	2	0.948	0.0367	0.8015	0.9872
13	28	0	1	0.948	0.0367	0.8015	0.9872
14	27	0	2	0.948	0.0367	0.8015	0.9872
16	25	0	5	0.948	0.0367	0.8015	0.9872
18	20	0	1	0.948	0.0367	0.8015	0.9872
19	19	2	0	0.8482	0.0744	0.6264	0.9437
20	17	0	3	0.8482	0.0744	0.6264	0.9437
21	14	0	1	0.8482	0.0744	0.6264	0.9437
22	13	0	2	0.8482	0.0744	0.6264	0.9437
24	11	0	2	0.8482	0.0744	0.6264	0.9437
25	9	0	1	0.8482	0.0744	0.6264	0.9437
28	8	0	2	0.8482	0.0744	0.6264	0.9437
30	6	0	1	0.8482	0.0744	0.6264	0.9437
32	5	0	2	0.8482	0.0744	0.6264	0.9437
40	3	0	1	0.8482	0.0744	0.6264	0.9437
43	2	0	1	0.8482	0.0744	0.6264	0.9437
61	1	0	1	0.8482	0.0744	0.6264	0.9437
MENA							
1	35	1	0	0.9714	0.0282	0.814	0.9959
2	34	1	0	0.9429	0.0392	0.7903	0.9854
5	33	2	1	0.8857	0.0538	0.7236	0.9555
9	30	1	2	0.8562	0.0595	0.6883	0.9375
10	27	0	1	0.8562	0.0595	0.6883	0.9375
11	26	0	1	0.8562	0.0595	0.6883	0.9375
12	25	0	1	0.8562	0.0595	0.6883	0.9375
15	24	0	1	0.8562	0.0595	0.6883	0.9375
17	23	0	2	0.8562	0.0595	0.6883	0.9375
18	21	0	2	0.8562	0.0595	0.6883	0.9375
20	19	0	2	0.8562	0.0595	0.6883	0.9375
22	17	0	1	0.8562	0.0595	0.6883	0.9375
24	16	1	1	0.8027	0.0762	0.5992	0.91
29	14	1	1	0.7453	0.0897	0.5189	0.8766
30	12	1	2	0.6832	0.1015	0.4413	0.8375
31	9	0	2	0.6832	0.1015	0.4413	0.8375
32	7	0	1	0.6832	0.1015	0.4413	0.8375
33	6	0	1	0.6832	0.1015	0.4413	0.8375
35	5	0	1	0.6832	0.1015	0.4413	0.8375
37	4	0	1	0.6832	0.1015	0.4413	0.8375
38	3	0	2	0.6832	0.1015	0.4413	0.8375

40	1	0	1	0.6832	0.1015	0.4413	0.8375
Others							
6	28	1	0	0.9643	0.0351	0.7724	0.9949
7	27	0	1	0.9643	0.0351	0.7724	0.9949
9	26	1	1	0.9272	0.0496	0.7389	0.9813
10	24	1	2	0.8886	0.0607	0.6927	0.9627
11	21	0	2	0.8886	0.0607	0.6927	0.9627
13	19	0	1	0.8886	0.0607	0.6927	0.9627
14	18	0	1	0.8886	0.0607	0.6927	0.9627
15	17	0	1	0.8886	0.0607	0.6927	0.9627
16	16	0	1	0.8886	0.0607	0.6927	0.9627
17	15	1	0	0.8293	0.0806	0.596	0.9346
19	14	0	1	0.8293	0.0806	0.596	0.9346
23	13	0	1	0.8293	0.0806	0.596	0.9346
24	12	0	1	0.8293	0.0806	0.596	0.9346
26	11	0	1	0.8293	0.0806	0.596	0.9346
30	10	0	1	0.8293	0.0806	0.596	0.9346
35	9	0	4	0.8293	0.0806	0.596	0.9346
50	5	1	0	0.6635	0.1617	0.2685	0.8798
62	4	0	1	0.6635	0.1617	0.2685	0.8798
80	3	1	1	0.4423	0.2103	0.0775	0.7709
90	1	0	1	0.4423	0.2103	0.0775	0.7709



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Time	Beg. Total	Fail	Net lost	Nelson-			
				Aalen Cum. Haz.	Std. Error	[95% Conf. Int.]	
GCC							
5	57	0	1	0	0	.	.
6	56	0	1	0	0	.	.
7	55	1	4	0.0182	0.0182	0.0026	0.1291
8	50	1	4	0.0382	0.027	0.0095	0.1529
9	45	0	5	0.0382	0.027	0.0095	0.1529
10	40	0	1	0.0382	0.027	0.0095	0.1529
11	39	2	5	0.0895	0.0452	0.0332	0.241
12	32	1	1	0.1207	0.055	0.0494	0.2947
13	30	0	1	0.1207	0.055	0.0494	0.2947
15	29	1	0	0.1552	0.0649	0.0684	0.3522

16	28	1	2	0.1909	0.0741	0.0892	0.4084
18	25	0	3	0.1909	0.0741	0.0892	0.4084
19	22	2	1	0.2818	0.0981	0.1425	0.5574
24	19	0	1	0.2818	0.0981	0.1425	0.5574
28	18	1	1	0.3374	0.1127	0.1753	0.6494
31	16	1	1	0.3999	0.1289	0.2126	0.7521
32	14	0	1	0.3999	0.1289	0.2126	0.7521
33	13	0	1	0.3999	0.1289	0.2126	0.7521
35	12	0	1	0.3999	0.1289	0.2126	0.7521
36	11	0	1	0.3999	0.1289	0.2126	0.7521
38	10	0	2	0.3999	0.1289	0.2126	0.7521
39	8	0	1	0.3999	0.1289	0.2126	0.7521
40	7	0	4	0.3999	0.1289	0.2126	0.7521
42	3	0	1	0.3999	0.1289	0.2126	0.7521
43	2	0	1	0.3999	0.1289	0.2126	0.7521
57	1	0	1	0.3999	0.1289	0.2126	0.7521

Asia

4	50	0	1	0	0	.	.
5	49	1	4	0.0204	0.0204	0.0029	0.1449
7	44	0	2	0.0204	0.0204	0.0029	0.1449
8	42	0	3	0.0204	0.0204	0.0029	0.1449
9	39	0	1	0.0204	0.0204	0.0029	0.1449
10	38	0	7	0.0204	0.0204	0.0029	0.1449
12	31	1	2	0.0527	0.0382	0.0127	0.218
13	28	0	1	0.0527	0.0382	0.0127	0.218
14	27	0	2	0.0527	0.0382	0.0127	0.218
16	25	0	5	0.0527	0.0382	0.0127	0.218
18	20	0	1	0.0527	0.0382	0.0127	0.218
19	19	2	0	0.1579	0.0836	0.0559	0.446
20	17	0	3	0.1579	0.0836	0.0559	0.446
21	14	0	1	0.1579	0.0836	0.0559	0.446
22	13	0	2	0.1579	0.0836	0.0559	0.446
24	11	0	2	0.1579	0.0836	0.0559	0.446
25	9	0	1	0.1579	0.0836	0.0559	0.446
28	8	0	2	0.1579	0.0836	0.0559	0.446
30	6	0	1	0.1579	0.0836	0.0559	0.446
32	5	0	2	0.1579	0.0836	0.0559	0.446
40	3	0	1	0.1579	0.0836	0.0559	0.446
43	2	0	1	0.1579	0.0836	0.0559	0.446
61	1	0	1	0.1579	0.0836	0.0559	0.446

MENA

1	35	1	0	0.0286	0.0286	0.004	0.2028
2	34	1	0	0.058	0.041	0.0145	0.2319
5	33	2	1	0.1186	0.0593	0.0445	0.3161
9	30	1	2	0.1519	0.068	0.0632	0.3654
10	27	0	1	0.1519	0.068	0.0632	0.3654
11	26	0	1	0.1519	0.068	0.0632	0.3654
12	25	0	1	0.1519	0.068	0.0632	0.3654
15	24	0	1	0.1519	0.068	0.0632	0.3654
17	23	0	2	0.1519	0.068	0.0632	0.3654
18	21	0	2	0.1519	0.068	0.0632	0.3654
20	19	0	2	0.1519	0.068	0.0632	0.3654
22	17	0	1	0.1519	0.068	0.0632	0.3654
24	16	1	1	0.2144	0.0924	0.0922	0.4989
29	14	1	1	0.2859	0.1168	0.1284	0.6366
30	12	1	2	0.3692	0.1435	0.1724	0.7907
31	9	0	2	0.3692	0.1435	0.1724	0.7907
32	7	0	1	0.3692	0.1435	0.1724	0.7907
33	6	0	1	0.3692	0.1435	0.1724	0.7907
35	5	0	1	0.3692	0.1435	0.1724	0.7907
37	4	0	1	0.3692	0.1435	0.1724	0.7907
38	3	0	2	0.3692	0.1435	0.1724	0.7907
40	1	0	1	0.3692	0.1435	0.1724	0.7907
Others							
6	28	1	0	0.0357	0.0357	0.005	0.2535
7	27	0	1	0.0357	0.0357	0.005	0.2535
9	26	1	1	0.0742	0.0525	0.0185	0.2969
10	24	1	2	0.1158	0.067	0.0373	0.36
11	21	0	2	0.1158	0.067	0.0373	0.36
13	19	0	1	0.1158	0.067	0.0373	0.36
14	18	0	1	0.1158	0.067	0.0373	0.36
15	17	0	1	0.1158	0.067	0.0373	0.36
16	16	0	1	0.1158	0.067	0.0373	0.36
17	15	1	0	0.1825	0.0945	0.0661	0.5037
19	14	0	1	0.1825	0.0945	0.0661	0.5037
23	13	0	1	0.1825	0.0945	0.0661	0.5037
24	12	0	1	0.1825	0.0945	0.0661	0.5037
26	11	0	1	0.1825	0.0945	0.0661	0.5037
30	10	0	1	0.1825	0.0945	0.0661	0.5037
35	9	0	4	0.1825	0.0945	0.0661	0.5037

50	5	1	0	0.3825	0.2212	0.1231	1.1883
62	4	0	1	0.3825	0.2212	0.1231	1.1883
80	3	1	1	0.7158	0.4001	0.2394	2.1405
90	1	0	1	0.7158	0.4001	0.2394	2.1405



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Appendix D

Split time (GLS and EXP)

VARIABLES	GLS	EXP
1bn.split_time	0.000618*** (0.000897)	0.000618*** (0.000897)
2.split_time	0.000176*** (0.000255)	0.000176*** (0.000256)
3.split_time	0 (6.52e-08)	0 (4.30e-08)
4.split_time	0 (5.47e-08)	0 (3.60e-08)
5.split_time	0.000366*** (0.000455)	0.000366*** (0.000455)
6.split_time	0.000147*** (0.000219)	0.000147*** (0.000219)
7.split_time	0.000101*** (0.000147)	0.000101*** (0.000147)
8.split_time	0.000107*** (0.000156)	0.000107*** (0.000156)
9.split_time	0.000255*** (0.000333)	0.000255*** (0.000333)
10.split_time	0.000161*** (0.000239)	0.000161*** (0.000239)
11.split_time	0.000341*** (0.000433)	0.000341*** (0.000433)
12.split_time	0.000443*** (0.000555)	0.000443*** (0.000555)
13.split_time	0 (6.13e-08)	0 (6.83e-08)
14.split_time	0 (7.68e-08)	0 (7.76e-08)
15.split_time	0.000218*** (0.000316)	0.000219*** (0.000316)
16.split_time	0.000199*** (0.000286)	0.000199*** (0.000286)
17.split_time	0.000259*** (0.000376)	0.000259*** (0.000376)
18.split_time	6.31e-11 (9.87e-08)	0 (9.80e-08)
19.split_time	0.00106*** (0.00110)	0.00106*** (0.00110)
20.split_time	7.00e-11 (1.13e-07)	0 (8.86e-08)
21.split_time	7.38e-11 (1.28e-07)	0 (7.30e-08)
22.split_time	6.70e-11 (1.11e-07)	0 (1.13e-07)
23.split_time	5.97e-11 (1.03e-07)	0 (7.84e-08)
24.split_time	0.000327*** (0.000478)	0.000327*** (0.000478)
25.split_time	5.84e-11 (1.08e-07)	0 (1.32e-07)
26.split_time	5.49e-11 (1.00e-07)	0 (1.24e-07)
27.split_time	5.17e-11 (9.28e-08)	0 (1.08e-07)
28.split_time	0.000289*** (0.000424)	0.000289*** (0.000424)
29.split_time	0.000296*** (0.000427)	0.000296*** (0.000427)

30.split_time	0.000272*** (0.000397)	0.000272*** (0.000397)
31.split_time	0.000307*** (0.000458)	0.000307*** (0.000458)
32.split_time	0 (7.60e-08)	0 (9.78e-08)
33.split_time	0 (7.75e-08)	0 (4.83e-08)
34.split_time	0 (7.81e-08)	0 (4.88e-08)
35.split_time	0 (7.14e-08)	0 (4.48e-08)
36.split_time	0 (8.95e-08)	0 (1.58e-07)
37.split_time	0 (8.48e-08)	0 (1.52e-07)
38.split_time	0 (8.24e-08)	0 (1.60e-07)
39.split_time	0 (1.08e-07)	0 (6.48e-08)
40.split_time	0 (1.20e-07)	1.19e-10 (3.03e-07)
41.split_time	0 (1.92e-07)	0 (1.12e-07)
42.split_time	0 (1.84e-07)	0 (1.08e-07)
43.split_time	0 (2.25e-07)	0 (1.31e-07)
44.split_time	9.03e-11 (9.03e-07)	0 (5.69e-07)
45.split_time	7.56e-11 (7.56e-07)	0 (4.76e-07)
46.split_time	8.70e-11 (6.15e-07)	4.25e-10 (1.90e-06)
47.split_time	1.03e-10 (5.96e-07)	3.36e-10 (1.42e-06)
48.split_time	7.44e-11 (4.30e-07)	0 (2.57e-07)
49.split_time	5.74e-11 (3.31e-07)	0 (1.96e-07)
50.split_time	0.00351*** (0.00517)	0.00351*** (0.00517)
51.split_time	6.12e-11 (4.33e-07)	0 (2.59e-07)
52.split_time	5.23e-11 (3.70e-07)	0 (2.23e-07)
53.split_time	0 (3.37e-07)	0 (2.05e-07)
54.split_time	0 (3.02e-07)	0 (1.84e-07)
55.split_time	0 (2.66e-07)	0 (1.65e-07)
56.split_time	0 (2.41e-07)	0 (1.50e-07)
57.split_time	0 (2.22e-07)	0 (1.39e-07)
58.split_time	5.01e-11 (3.55e-07)	3.59e-10 (1.34e-06)
59.split_time	0 (2.12e-07)	0 (1.33e-07)
60.split_time	0 (1.97e-07)	0 (1.24e-07)
61.split_time	0 (1.90e-07)	0 (1.20e-07)
62.split_time	0 (2.69e-07)	0 (1.70e-07)
64.split_time	6.14e-11	6.81e-10

	(6.14e-07)	(3.09e-06)
65.split_time	2.12e-10	0
	(2.12e-06)	(1.34e-06)
66.split_time	1.71e-10	0
	(1.71e-06)	(1.08e-06)
67.split_time	1.60e-10	0
	(1.60e-06)	(1.01e-06)
68.split_time	1.34e-10	0
	(1.34e-06)	(8.42e-07)
69.split_time	1.24e-10	0
	(1.24e-06)	(7.84e-07)
70.split_time	1.05e-10	5.76e-10
	(7.46e-07)	(2.26e-06)
71.split_time	1.57e-10	0
	(1.11e-06)	(6.49e-07)
72.split_time	1.27e-10	0
	(9.01e-07)	(5.33e-07)
73.split_time	1.22e-10	4.70e-10
	(7.06e-07)	(1.70e-06)
74.split_time	9.47e-11	0
	(5.47e-07)	(3.29e-07)
75.split_time	8.15e-11	0
	(4.71e-07)	(2.82e-07)
76.split_time	6.93e-11	0
	(4.00e-07)	(2.40e-07)
77.split_time	6.19e-11	0
	(3.57e-07)	(2.13e-07)
78.split_time	5.43e-11	0
	(3.13e-07)	(1.89e-07)
79.split_time	0	0
	(2.70e-07)	(1.63e-07)
80.split_time	0.00305***	0.00305***
	(0.00453)	(0.00453)
81.split_time	6.79e-11	0
	(6.79e-07)	(4.28e-07)
82.split_time	5.30e-11	0
	(5.30e-07)	(3.34e-07)
83.split_time	0	0
	(4.43e-07)	(2.79e-07)
84.split_time	0	0
	(3.84e-07)	(2.42e-07)
85.split_time	0	0
	(3.33e-07)	(2.10e-07)
86.split_time	0	0
	(3.22e-07)	(2.03e-07)
87.split_time	0	0
	(2.89e-07)	(1.82e-07)
88.split_time	0	0
	(2.79e-07)	(1.76e-07)
89.split_time	0	0
	(2.69e-07)	(1.70e-07)
90.split_time	0	0
	(2.60e-07)	(1.64e-07)
recently	1.036***	1.036***
	(0.00852)	(0.00852)
_t		
Observations	1,476	1,476

seEform in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Appendix E

Semi-parametric

Cox regression -- Breslow method for ties

```

No. of subjects =      1,455                Number of obs   =      1,455
No. of failures =         28
Time at risk    =      3454
LR chi2(10)     =      45.00
Log likelihood  =    -176.19469            Prob > chi2     =      0.0000
  
```

```

-----+-----
_t | Haz. Ratio   Std. Err.      z    P>|z|    [95% Conf. Interval]
-----+-----
recent |  1.047515   .0135904    3.58  0.000    1.021214   1.074493
onill1 |  1.001555   .0005655    2.75  0.006    1.000447   1.002664
enll1  |  .9987477   .0005145   -2.43  0.015    .9977398   .9997566
nlta1  |  .999433    .0005058   -1.12  0.262    .9984423   1.000425
llil1  |  1.005148   .0025357    2.04  0.042    1.000191   1.010131
tcr1   |  1.001664   .0014006    1.19  0.234    .9989226   1.004413
ooial  |  .9972033   .0012286   -2.27  0.023    .9947983   .9996142
nieal  |  1.001955   .0009934    1.97  0.049    1.00001    1.003903
gdpp3  |  .4670574   .1617789   -2.20  0.028    .2368819   .9208918
inf3   |  .9956917   .0035523   -1.21  0.226    .9887536   1.002678
  
```

Shared of 2

Stratified Cox regr. -- Breslow method for ties

```

No. of subjects =      1,455                Number of obs   =      1,455
No. of failures =         28
Time at risk    =      3454
LR chi2(10)     =      45.08
Log likelihood  =    -157.2026            Prob > chi2     =      0.0000
  
```

```

-----+-----
_t | Haz. Ratio   Std. Err.      z    P>|z|    [95% Conf. Interval]
-----+-----
recent |  1.048848   .0140347    3.56  0.000    1.021698   1.076719
onill1 |  1.00152    .0005635    2.70  0.007    1.000416   1.002625
enll1  |  .9988457   .000524    -2.20  0.028    .9978192   .9998732
nlta1  |  .999452    .0005224   -1.05  0.294    .9984288   1.000476
llil1  |  1.005104   .002548     2.01  0.045    1.000123   1.010111
  
```

tcr1	1.001588	.0014018	1.13	0.257	.9988446	1.00434
ooia1	.996942	.0012858	-2.37	0.018	.994425	.9994654
niea1	1.002021	.0010107	2.00	0.045	1.000042	1.004003
gdpp3	.4371716	.1653015	-2.19	0.029	.2083527	.9172858
inf3	.9954825	.0036137	-1.25	0.212	.9884249	1.002591

Stratified by groupy

Shared of 4

Stratified Cox regr. -- Breslow method for ties

No. of subjects =	1,455	Number of obs =	1,455
No. of failures =	28		
Time at risk =	3454		
LR chi2(10) =	49.44		
Log likelihood =	-136.62442	Prob > chi2 =	0.0000

_t	Haz. Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	
recent	1.047015	.0142055	3.39	0.001	1.01954	1.075231
onill	1.001609	.0005834	2.76	0.006	1.000467	1.002753
enl1	.9989276	.0005219	-2.05	0.040	.9979053	.999951
nltal	.9991644	.0005456	-1.53	0.126	.9980956	1.000234
lli1	1.004855	.0026007	1.87	0.061	.9997708	1.009965
tcr1	1.001337	.0013924	0.96	0.337	.9986115	1.00407
ooia1	.997058	.0013339	-2.20	0.028	.994447	.9996758
niea1	1.00212	.0010342	2.05	0.040	1.000095	1.00415
gdpp3	.0800754	.0868735	-2.33	0.020	.0095507	.6713737
inf3	.9980842	.0035078	-0.55	0.585	.9912326	1.004983

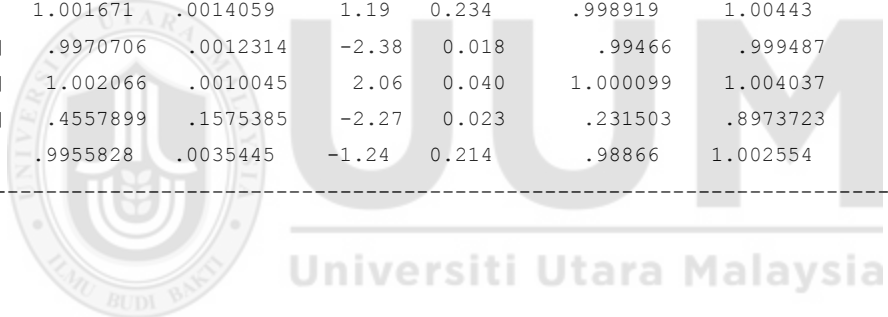
Stratified by group

Efron

Cox regression -- Efron method for ties

No. of subjects = 1,455 Number of obs = 1,455
No. of failures = 28
Time at risk = 3454
LR chi2(10) = 46.44
Log likelihood = -175.24895 Prob > chi2 = 0.0000

```
-----  
_t | Haz. Ratio    Std. Err.        z    P>|z|        [95% Conf. Interval]  
-----+-----  
recent | 1.048526    .0135997        3.65   0.000        1.022207    1.075522  
onil1 | 1.001634    .000573        2.85   0.004        1.000512    1.002758  
enl1 | .9987205    .0005145      -2.49   0.013        .9977126    .9997295  
nltal | .9993834    .0005073      -1.22   0.224        .9983896    1.000378  
lli1 | 1.005267    .0025459        2.07   0.038        1.000289    1.010269  
tcr1 | 1.001671    .0014059        1.19   0.234        .998919    1.00443  
ooia1 | .9970706    .0012314      -2.38   0.018        .99466    .999487  
nieal | 1.002066    .0010045        2.06   0.040        1.000099    1.004037  
gdpp3 | .4557899    .1575385      -2.27   0.023        .231503    .8973723  
inf3 | .9955828    .0035445      -1.24   0.214        .98866    1.002554  
-----
```



Appendix F

Parameterization

Weibull Distribution

_t	Haz. Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	
recent	1.048525	.0108676	4.57	0.000	1.027439	1.070043
onl1	1.001566	.0005597	2.80	0.005	1.000469	1.002663
enl1	.9987991	.0005213	-2.30	0.021	.9977779	.9998215
nlta1	.9993971	.0005133	-1.17	0.240	.9983915	1.000404
llil	1.005233	.0025463	2.06	0.039	1.000255	1.010236
tcr1	1.001729	.0013929	1.24	0.214	.9990024	1.004462
ooia1	.9970454	.001244	-2.37	0.018	.9946102	.9994865
niea1	1.00208	.0010085	2.06	0.039	1.000106	1.004059
gdpp3	.4518342	.1603631	-2.24	0.025	.2253586	.9059078
inf3	.995641	.0034173	-1.27	0.203	.9889657	1.002361
_cons	2.12e-06	4.30e-06	-6.45	0.000	4.00e-08	.0001124
/ln_p	.113253	.1678959	0.67	0.500	-.2158169	.4423228
p	1.119915	.1880291			.8058828	1.556318
1/p	.8929248	.1499184			.6425422	1.240875

Exponential Distribution

_t	Haz. Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	
recent	1.05001	.0108255	4.73	0.000	1.029005	1.071443
onl1	1.001566	.0005583	2.81	0.005	1.000472	1.002661
enl1	.9987709	.0005155	-2.38	0.017	.997761	.9997819
nlta1	.9993976	.000507	-1.19	0.235	.9984045	1.000392
llil	1.005324	.0025464	2.10	0.036	1.000345	1.010327
tcr1	1.001757	.0014014	1.25	0.209	.9990143	1.004508
ooia1	.9971489	.0012259	-2.32	0.020	.9947491	.9995546
niea1	1.00201	.0009948	2.02	0.043	1.000062	1.003962
gdpp3	.4577511	.1591532	-2.25	0.025	.2315684	.904856
inf3	.9956195	.003465	-1.26	0.207	.9888514	1.002434
_cons	2.55e-06	5.15e-06	-6.38	0.000	4.86e-08	.0001337

Gompertz Distribution

_t	Haz. Ratio	Std. Err.	z	P> z	[95% Conf. Interval]	
recent	1.04937	.0109302	4.63	0.000	1.028165	1.071013
onill	1.001573	.0005596	2.81	0.005	1.000477	1.002671
enll	.9987835	.0005185	-2.34	0.019	.9977678	.9998003
nlta1	.9993891	.0005115	-1.19	0.232	.9983872	1.000392
llil	1.005284	.0025458	2.08	0.037	1.000307	1.010286
tcr1	1.001714	.0014025	1.22	0.221	.9989694	1.004467
ooia1	.9970929	.0012422	-2.34	0.019	.9946613	.9995305
niea1	1.002047	.0010054	2.04	0.042	1.000078	1.00402
gdpp3	.4481827	.160789	-2.24	0.025	.2218605	.9053787
inf3	.9956808	.0034348	-1.25	0.210	.9889714	1.002436
_cons	2.61e-06	5.26e-06	-6.38	0.000	5.03e-08	.0001356
/gamma	.0048753	.0136206	0.36	0.720	-.0218207	.0315712



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Appendix G

Panel Survival

```

Random-effects Weibull regression
Group variable:      bankid
Number of obs      =      1,455
Number of groups   =      167
Obs per group:
    min =           1
    avg =           8.7
    max =           27
Integration method: mvaghermite
Integration pts.   =      12

Log likelihood = -52.320675
Wald chi2(10)     =      45.08
Prob > chi2       =      0.0000
  
```

_t	Haz. Ratio	Std. Err.	z	P> z	[95% Conf. Interval]
recent	1.048521	.0108672	4.57	0.000	1.027437 1.070038
onill	1.001566	.0005597	2.80	0.005	1.000469 1.002663
enll	.9987989	.0005213	-2.30	0.021	.9977776 .9998212
nltal	.9993971	.0005133	-1.17	0.240	.9983914 1.000404
llil	1.005233	.0025462	2.06	0.039	1.000255 1.010236
tcr1	1.001729	.001393	1.24	0.214	.9990024 1.004463
ooial	.9970428	.0012443	-2.37	0.018	.994607 .9994846
nieal	1.002084	.0010087	2.07	0.039	1.000109 1.004063
inf3	.9956416	.0034173	-1.27	0.203	.9889662 1.002362
gdpp3	.4522185	.1604133	-2.24	0.025	.2256346 .9063396
_cons	2.55e-06	5.15e-06	-6.45	0.000	3.99e-08 .0001123
/ln_p	.1133424	.1678811	0.68	0.500	-.2156985 .4423833
/sigma2_u	1.80e-30	3.05e-15			.

```

Mixed-effects Weibull regression
Group variable:      bankid
Number of obs      =      1,455
Number of groups   =      167
Obs per group:
    min =           1
    avg =           8.7
    max =           27
Integration method: mvaghermite
Integration pts.   =      7

Log likelihood = -52.320675
Wald chi2(10)     =      45.08
Prob > chi2       =      0.0000
  
```

_t	Haz. Ratio	Std. Err.	z	P> z	[95% Conf. Interval]
recent	1.048521	.0108672	4.57	0.000	1.027437 1.070038
onill	1.001566	.0005597	2.80	0.005	1.000469 1.002663
enll	.9987989	.0005213	-2.30	0.021	.9977776 .9998212
nltal	.9993971	.0005133	-1.17	0.240	.9983914 1.000404
llil	1.005233	.0025462	2.06	0.039	1.000255 1.010236
tcr1	1.001729	.001393	1.24	0.214	.9990024 1.004463
ooial	.9970428	.0012443	-2.37	0.018	.994607 .9994846
nieal	1.002084	.0010087	2.07	0.039	1.000109 1.004063
inf3	.9956416	.0034173	-1.27	0.203	.9889662 1.002362
gdpp3	.4522185	.1604133	-2.24	0.025	.2256346 .9063396
_cons	2.61e-06	5.26e-06	-6.45	0.000	3.99e-08 .0001123
/ln_p	.1133424	.1678811	0.68	0.500	-.2156985 .4423833
bankid					
var(_cons)	3.36e-32	7.25e-16			.