Motor Insurance: A Comparative Analysis : Asia-North America

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Mr. Germain Denoncourt, FCAS, FCIA

Montreal, Canada

www.coefficient-act.com

coefficient
actuarial+consulting

Before the Introduction

☐ North America - «Automobile Insurance» … wrong name ?
   (includes motocycle, truck, bus, ATV, snowmobile …)

☐ UK and outside - «Motor Insurance» : … wrong name ?
   (does not include motorized boat, tram, submarine …)

Let's say we are talking here about cars, trucks, motocycles …
2-3-4 wheels, on the ground, not amphibian !

Introduction

☐ Choice 1 : could include plenty of data tables, discuss less

☐ Choice 2 : could include less data tables, discuss and interpret more …

Δ *Have to consider comparability of available data and time for presentation*

→ Choice number 2, with main ones only, see how to get more comparable stats in the future, go from known to unkown (or «less unknown»)

Main Content

- Part 1 Vehicle fleets, death rates … «maturity» per country (slides 5-18)

- Part 2 Market share/evolution/quick cases per country (slides 18-28)

- Part 3 Data, actuarial techniques evolution … «usage based insurance» (slides 28 +)

Part 1
Overview of vehicles quantity-density and maturity of fleet

Tables : Motor vehicles per capita, death rates, «maturity»

- ☐ «Mature market 1» tables : Province of Ontario, Canada

- ☐ «Mature market 2» tables : Province of Quebec, Canada

- ☐ «Mature market 3» : a quick look at USA

- ☐ Comparative table for main Asian countries

- ☐ Comparative table for other countries

Province of Ontario,Canada

(Mature market example 1)

- Population (July 2008): 12,929,000

- Private insurers only, 10 billions CAD$ premiums a year

- Mandatory coverages for injuries : no-fault, but can sue at fault driver if over given treshold

- Mandatory coverage : first party physical damage to cars not-at-fault: Direct Compensation Property Damage (DCPD) since 1994

- Optional coverages : Collision (own car at-fault damage) Comprehensive (theft, vandalisme, hail, …)(UM and UDM exist too)

Province of Ontario,Canada

(Mature market example 1)

Actuarial and ratemaking aspects :

□ Prior approval about rates

□ Actuarial support needed : very detailed «rate filings» for Private Passenger Automobiles (PPA), less restrictive for other type of vehicles

□ Rating restrictive or prohibited for many risk factors for PPA

Next slide : PPA = no motorcycles, no ATV's, … only 4 wheels vehicles for personal use and/or limited business

Province of Ontario,Canada

(Mature market example 1)

Year	Population		Written		Written		Loss
	July	%	PPA vehicles	%	PPA Vehi	%	ratios
	('000)	Var	PPA ~ 80% of all vehi	Var	per capita	Var	GISA
2008	12,929	1.1%	6,484	1.5%	0.502	0.4%	80%
2007	12,794	1.0%	6,390	1.9%	0.499	0.9%	80%
2006	12,665	1.1%	6,271	2.3%	0.495	1.2%	72%
2005	12,529	1.1%	6,132	2.6%	0.489	1.5%	67%
2004	12,391		5,974		0.482		62%
5 years			31,251				72%

Province of Quebec, Canada
(Mature market example 2)

- Population (July 2008): 7,751,000

- "Gauvin Report" 1974: high premiums, accessibility problems, uninsured motorists, slow payments …

- 1978 Creation of «Société de l'Assurance Automobile du Québec» (SAAQ) - Injuries covered by No-Fault government insurer

- Private Insurers: No-Fault Physical Damage to cars if not-at-fault – DCPD ; very few lawsuits remain

- Private Insurers: Optional coverages «own damage» as Ontario

- «Different» regime, stable since 1978, mature data for actuaries

- «Free rating» : open competition on rates, no regulation as such, *encouraging* very creative P&C actuaries since 1978

Quebec - Private Insurers

Year	Population July ('000)	% Var 5 years	Written Vehicles PPA ~ 80% of all vehi	% Var 5 years	Written Vehicles per capita	% Var 5 years	Loss ratios GAA
2007	7,686	0.7%	4,352	2.4%	0.566	1.7%	63%
2002	7,441	0.5%	3,864	2.4%	0.519	2.0%	62%
1997	7,275	0.5%	3,430	1.6%	0.471	1.1%	81%
1992	7,110	1.0%	3,175	2.9%	0.447	2.0%	69%
1987	6,781	0.6%	2,749	5.0%	0.405	4.4%	84%
1982	6,581		2,153		0.327		56%

Quebec – Government insurer

SAAQ – Death rates

Year	Registered Vehicles (all)	Deaths	Death rate per 100 000 vehi	Ratio 1973 vs year
2008	5,665,272	557	9.80	9.9
2007	5,539,013	608	10.98	8.9
2006	5,402,353	721	13.35	7.3
2005	5,306,534	707	13.32	7.3
2004	5,203,491	644	12.38	7.9
2003	5,063,449	623	12.30	7.9
2002	4,881,265	704	14.42	6.8
1973 Max	2,265,471	2 209	**97.50**	1.0

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A look at USA motor insurance

- Regulation, rate regulation, insurance policy coverages, benefits, actuarial involvement : all vary per US state (as in Canada – per province)

- Very few government insurers for motor insurance (more in worker's compensation insurance)

- Maturity of vehicle fleet, motor insurance market, deaths and other – similarity of patterns vs Canada exemplified by Ontario and Quebec

Part 1
Overview of vehicles quantity-density and maturity of fleet

Keep in mind previous tables on mature Canadian data and USA observations

Let's compare (and discuss) several major points with Asia and other countries - next 2 slides

Part 1
Overview of vehicle fleet, densities, death rates, maturity evaluation

Comparative Table 1 (main source : WHO 2009 report)

Country/ Region	Pop. 2007 ('000)	Registered vehicles ('000)	Vehicles per capita	% 2 or 3 wheels	Deaths*	Death rate per capita (per 100 000)	Death rate per vehi (per 100 000)	1973 Death rate per vehi (per 100 000)
Canada	33	20,0	0,61	3%	2,889	8,8	14,4	
Quebec	8	4,4	0,57	3%	608	7,9	14,0	94,5**
USA	306	251	0,82	3%	42,642	13,9	17,0	
UK	61	34,3	0,56	4%	3,298	5,4	9,6	
Singapore	4,4	0,9	0,19	17%	214	4,8	25,1	
Malaysia	27	16,8	0,63	47%	6,282	23,6	37,3	
Philippines	88	5,5	0,06	48%	1,185	1,3	21,5	
Indonesia	232	63,3	0,27	73%	16,548	7,1	26,1	
China	1,336	145	0,11	n/a	89,455	6,7	61,6	
India	1,169	72,7	0,06	71%	105,725	9,0	145,4	

Part 1
Overview of vehicle fleet, densities, death rates, maturity evaluation

Comparative Table 2 (source : WHO, 2009 report)

Country/ Region	Pop. 2007 ('000)	Registered Vehicles ('000)	Vehicles per capita	% 2 or 3 wheels	Deaths*	Death rate per capita (per 100 000)	Death rate per vehicle (per 100 000)
Canada	32,9	20,065	0.61	3%	2,889	8,8	14,4
Quebec	7,7	4,353	0.57	3%	608	7,9	14,0
France	61,6	39,9	0.65	6%	4,620	7,5	11,6
Russia	142,5	38,7	0.27	8%	33,308	23,4	86,1
Turkey	74,9	13,3	0.18	15%	4,633	6,2	34,8
Brazil	191,8	49,6	0.26	22%	35,155	18,3	70,8
Argentina	39,5	12,4	0.31	n/a	4,063	10,3	32,8
Mexico	106,5	25,0	0.23	3%**	17,003	16,0	68,1
South Africa	48,6	9,2	0.19	4%**	14,920	30,7	161,5
Egypt	75,5	4,3	0.06	19%	12,295	16,3	285,9
Cameroun	18,5	0,31	0.02	21%	990	5,3	317,0

Part 1 : Evolution China motor casualties

Table 3 : (source : China Ministry of transportation)

China Road Injuries and Death Data

Year	Population In billions	Injuries (000)	Deaths (000)	Injury rate (per 100 000)	Death rate (per 100 000)
2004	1,300	452	99	347,7	23,7
2005	1,308	470	99	359,4	19,8
2006	1,314	431	89	327,9	14,8
2007	1,321	380	82	287,6	11,3

Part 1 : Tables 1-3 interpretation

Mature markets :

☐ Much lower % of 2-3 wheelers (winter neutralized !)

☐ Lower death rates reasons: lower % of 2-3 wheelers, seat belt laws, drinking and driving control, air bags, other passive and active safety measures

☐ Higher car densities per capita (wealth/disposible income)

☐ Higher penetration of insurance per capita (wealth …)

☐ More reasonable insurance cost per insured car … both insurers and consumers are «winners» when motor insurance markets and safety measures mature ?

Part 1 : From table 1-3 some thoughts for discussion

For private insurers :

☐ Evolution of markets – bigger fleets and higher penetration to come, but so many other elements

☐ Use expertise from mature markets/insurers/executives ?

For governments, regulators :

☐ Consider effects of No-Fault/Government insurers bodies

☐ Consider costs to society

For both … and car owners/insurance consumers :

☐ Insurance cost per insured vehicle … all are «winners» when motor insurance markets and safety measures mature ?

Part 2 : Market analysis

Tables of market share, concentration per top X insurers, for some countries, selected years when comparable data possible

Part 2 : Market analysis

Analysis of market share per country – quick case studies

❑ Mature insurance markets : in what direction goes the concentration flow (towards a Gini equilibrium point ?)

❑ «Mid-state» markets : the example of South American countries – all lines

❑ Emerging insurance markets : the example of China in early years - in motor insurance

❑ Other examples

Note : Difficulties for finding comparable data from abroad : memberships needed or other restrictiions

Part 2 : Market share analysis –
a picture North America/Latin America

Comparative Table 4 (source : Latino Insurance 2008, Canada 2007)

Country/ Region	Market share – Gross Written Premiums					DWP $US
	Top 1	Top 2	Top 5	Top 10	Top 20	
Canada P&C	11%	19%	35%	55%	78%	$35B
USA,P&C,2004	10%	17%	33%	47%	62%	$482B
Brazil, all	24%	41%	62%	79%	90%+	$45B
Mexico, all	14%	26%	51%	72%	85%+	$19B
Venezuela, all	12%	22%	48%	70%	n/a	$10B
Argentina, all	8%	15%	33%	54%	73%	$8B
Chile, all	9%	17%	37%	61%	n/a	$7B
Colombia, all	22%	34%	59%	81%	n/a	$5B
Peru, all	34%	66%	90%	n/a	n/a	$1.4B
Ecuador, all	12%	24%	39%	58%	83%	$0.8B

Part 2 : Market share analysis –
a picture North America/China

Comparative Table 5
(sources : CAS, Canadian data, NAIC USA)

| Country / Region* | Motor (+other) insurers market share Gross Written Premiums – 2008 | | | | | $ DWP |
	Top 1	Top 2	Top 5	Top 10	Top 20	Billions USD
Canada, Motor	14%	24%	46%	72%	92%	$16B
USA,P&C	10%	17%	33%	47%	62%	$482B
USA,Motor PPA	19%	29%	46%	62%	76%	$163B
USA,HO	23%	34%	50%	64%	75%	$54B
China Motor	69%	77%	85%	89%	100%	All $53B

* All 2004 data

Part 2 : Market share analysis – evolution
Early years of China motor insurance market

Table 6 (Source : Casualty Actuarial Society Forum, 2007)

		Market Share for China Motor Insurance				
Year	No. of domestic insurers	Market share Number 1	Number 2	Number 3	Number 4	All others
2002	10	70.7%	13.5%	11.1%	1.1%	3.6%
2003	10	70.8%	11.8%	9.1%	3.0%	5.3%
2004	11	68.7%	8.5%	8.3%	4.0%	10.6%
2005	17	53.3%	14.5%	8.8%	6.0%	17.3%

Part 2 : Market share analysis – the Philippines, population 92 millions, 7 107 islands … a market as fragmented as the archipelago ?

Part 2 : Market share analysis – the Philippines example – fragmented, slowly concentrating

Table 7 ($840M USD in 2008 Source : Philippines Insurance Commission, March 2010)

Market Share for the Philippines Non-Life Insurance (% of GWP)						
Year	Number of active insurers	Top 1	Top 5	Top 10	Top 20	Gini Coefficient	**P**GWP
2005	93	13.5%	39.0%	58.1%	77.3%	0.707	33,1
2006	92	15.0%	41.2%	60.5%	77.7%	0.710	33,6
2007	88	15.0%	41.2%	60.3%	78.3%	0.701	35,7
2008	86	16.5%	43.2%	63.0%	79.5%	0.706	37,7

Note : GWP in billions of Philippinian pesos

Part 2 : Markets – Evolution in number of policies in India Non Life Insurance

Table 8 : POLICIES ISSUED : NON-LIFE INSURERS in INDIA

Insurer	2008-09	2007-08	2006-07	2005-06	2004-05	2003-04
Public Sector	45,137 181	38,547,040	33,972,092	42,193,079	44,634,047	38,427,204
	(17.09)	(13.47)	(-19.48)	(-5.47)	(16.15)	(-8.26)
Private Sector	21,922 906	18,703,219	12,692,053	8,947,516	5,144,755	3,298,827
	(17.21)	(47.36)	(41.85)	(73.92)	(55.96)	(96.72)
TOTAL	67,060 087	57,250,259	46,664,145	51,140,595	49,778,802	41,726,031
	(17.13)	(22.69)	(-8.75)	(2.74)	(19.30)	(-4.21)

Note: Figure in bracket indicates the growth over the previous year.
(Source : Annual report 2009, Insurance Regulatory and Development Authority of India)
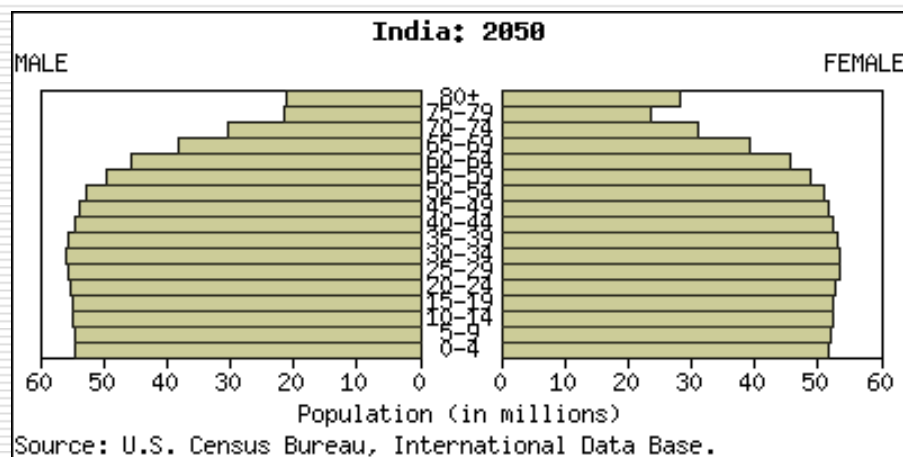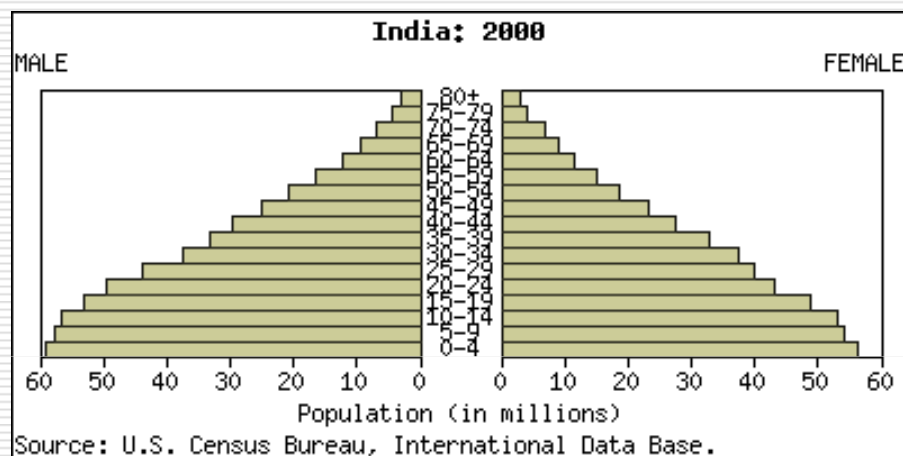
Parts 1-2 : China motor insurance market

Impacts on vehicles per capita, accidents, insurance premiums, market share … ?
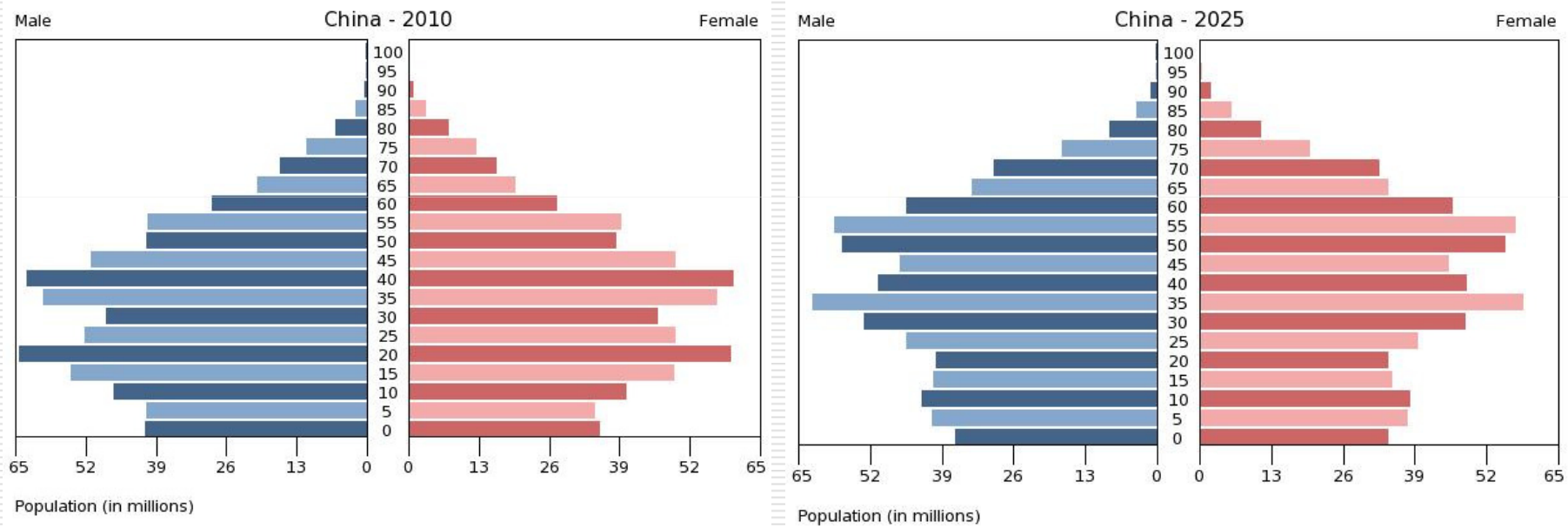
Parts 1-2 : India motor insurance market

Impacts on vehicles per capita, accidents, insurance premiums, market shares … ?

Part 3 : Data, actuarial techniques

- ☐ Actuarial techniques, databases and other aspects in automobile/motor insurance are becoming more and more sophisticated

- ☐ Exchange of information and comparison with what is done in other countries is useful for actuaries and insurance companies

Part 3 : Motor insurance ratemaking - a look into the past (North America)

- ☐ 1970's and before : no computers, limited data

- ☐ 1980's to ~ late 1990's : traditional loss ratio and pure premium ratemaknig methods, some early birds in advanced stats (as vehicle classification - Canada)

- ☐ 2000-2010 : sophistication, much more GLM's, NN, UBI …

Database sophistication, data granularity, in depth analysis and KOL rating by GLM's more and more frequent in auto (in homeowners, worker's compensation, and commercial insurance too)

Part 3 : Motor insurance ratemaking
Now and a look into the future (North America)

- ☐ Important increase in number of risk factors/rating criteria

- ☐ Include client reactions in rates : sensivity/elasticity studies vs insurance premium variations

- ☐ Optimization pricing techniques

- ☐ ↑ or ↓ of regulation and government presence ?

- ☐ Continuing trend vs ↑ of direct writers market share in personal lines insurance (PPA, HO) ?

- ☐ Threatening or promising «Usage Based Insurance» in auto (UBI – rates based on GPS data per car, per zone, time driven …) ?

Part 3 - Future evolution – a simple example - we need or we fear UBI ?

Estimated risk per season, frequency (Quebec SAAQ data)*

Season	Death	Serious injury	Minor injury	All categories
Spring	**1.00**	**1.00**	**1.00**	**1.00**
Summer	1.87	1.67	1.40	1.45
Fall	1.28	1.28	1.19	1.20
Winter	1.14	1.23	1.15	1.17

* For one given past year, whole Quebec province – over 700 deaths and 40 000 injuries, not controlled for factor effects other than season itself, No-Fault system

Part 3 - Future evolution – a simple example - we need or we fear UBI ?

Estimated risk per day of week, frequency (Quebec SAAQ data)*

Day of week	Death	Serious injury	Minor injury	All categories
Monday	1.18	1.04	0.96	0.98
Tuesday	1.25	0.95	1.01	1.01
Wednesday	**1.00**	**1.00**	**1.00**	**1.00**
Thursday	1.27	1.19	1.14	1.15
Friday	2.17	1.53	1.31	1.35
Saturday	1.78	1.41	1.15	1.19
Sunday	1.68	1.37	1.06	1.11

* For one given past year, whole Quebec province, not controlled for other factors …

So, what's next ?

Question period – open discussion, brainstorm, networking.

Thank you !

Contact information :

Mr. Germain Denoncourt, FCAS, FCIA

Consulting Actuary, Coefficient Actuarial Consulting

Mrs. Liliane Florence Woo (Université du Québec à Montréal)

Actuarial researcher, including for the websites from China

1200 McGill College Avenue, suite 1100

Montreal, Que. Canada

H3B 4G7

514 390-2347

gdenoncourt@coefficient-act.com; @info@coefficient-act.com

www.coefficient-act.com

coefficient
actuarial+consulting