

School of Economics and Finance
MMAF 522 RISK AND INSURANCE

Trimester 2, 2016

COURSE OUTLINE

Lecturer Leigh Roberts, RWW 214, phone 463-5937 (coordinator)
 office hour: 9.30 - 10.20 Tuesdays in RWW 214
 email: leigh.roberts@vuw.ac.nz

Administrator Rachel Zhang, RWW 120, phone 463-6148
 email: viaf.programme@vuw.ac.nz

Lecture times Monday 9.30 - 11.20, RWW 129

Trimester dates

Teaching Period: Monday 11 July to Friday 14 October 2016

Study Period: Monday 17 October to Thursday 20 October 2016

Examination Period: Friday 21 October to Saturday 12 November 2016 (inclusive)

Withdrawal from the course

Your fees will be refunded if you withdraw from this course on or before Friday 22 July 2016.

The standard last date for withdrawal from this course is Friday 23 September 2016. After this date, students forced to withdraw by circumstances beyond their control must apply for permission on the form 'Application for Associate Dean's permission to Withdraw Late', and include supporting documentation. This form is available from either of the Faculty's Student Customer Service Desks or online.

Prescription

Selected topics in financial risk management and insurance, from traditional approaches to risk management to recent broader interpretations. Topics include the global financial crisis; credit derivative securities; insurance markets, reinsurance and alternative means of transferring risk; the inter-relationship between banks, insurance companies and other institutions in the finance sector; and regulation of the finance sector.

Course Learning Objectives

By the end of this course, students should be able

1. To explain the extent and scope of risk management, and its manifold interpretations.
2. To establish a clear framework and methodology for dealing with risk.
3. To summarise elementary aspects of theories of risk and uncertainty, with special emphasis on risk management in the finance sector.
4. To investigate insurance theory and practice; and in particular to explore the use of insurance, both as a means of transferring risk, and more generally as providing a framework for the consideration of risk.
5. To interpret recent developments in risk management, in particular the use of the capital markets, and the inter-relationship between institutions active in the finance sector.
6. To recognise the potential of, as well as the limitations of, quantitative models and methodologies in dealing with risk.

Course Content

The content and timing of the course, and the order of presentation, may differ slightly from the information given in the following table.

Date, 2016	Week	Theme	Essay	Ass set due	Tut
11 - 15 July	1	Introduction, overview of RM		1	
18 - 22 July	2	Value at risk; Insurance			T
25 - 29 July	3	Savings & Loan, GFC		2 1	
1 - 5 Aug	4	Securitisation, shadow banks			T
8 - 12 Aug	5	GFC	A1		T
15 - 19 Aug	6	Case studies		2	
<i>Mid-trimester break, 2 weeks: Monday 22 August - Friday 2 September 2016</i>					
5 - 9 Sep	7	ART, cat bonds, ILS, captives			
12 - 16 Sep	8	Hedge Funds, LTCM	E1		
19 - 23 Sep	9	LTCM; Enron	A2		
26 - 30 Sep	10	Enron; Dark Pools, HFT			
3 - 7 Oct	11	Regulation: Basel 2/3, Solvency 2	E2		
10 - 14 Oct	12	Dodd Frank			

Under the Essay column, 'A1' denotes approval of the first essay topic by the coordinator; and 'E2' the due date of the second essay, etc. Further columns indicate the weeks in which assignments 1 and 2 are set and due; and the timings of tutorials for assistance with the computer suite R when students are working on assignment 2.

Assignments are set in the week indicated above, to be handed in to blackboard by the Friday (midnight) two or three (course) weeks later. The coordinator may give permission for mathematical assignments to be handed in to Box 29 on level 1, RWW.

Students may choose their own topics for their essays, provided the topics chosen are consonant with the broad aims of the course. Essay topics are subject to approval by the coordinator, by email, no later than the end of the weeks indicated above by A1 and A2. Students are however encouraged to think about essay topics from inception of the course, and to seek the coordinator's approval well before the deadlines.

The essays are due by the end of weeks 8 and 11, viz. Friday 16 September and Friday 7 October 2016, and are to be submitted electronically to Blackboard, by midnight on the due dates.

As well as names and student ID, submitted essays and assignments should list the approximate number of words, and have page numbers inserted. Penalties may be imposed if the length of work submitted does not lie within the recommended range, and for late submission: see the Penalties section below.

Further notes on the requirements for essays in this course are available on Blackboard: <http://www.blackboard.vuw.ac.nz/>.

Expected Workload

You should expect to spend about 12-14 hours per week reading, studying and completing essays and assignments. Overall it is expected that you will spend approximately 200 hours on completing this course.

Readings

Lecture notes and readings will be made available on Blackboard.

It is *not* recommended that you purchase any text books for this course.

Parts of the course will be based on Hull (2012).

- J C Hull (2012), *Risk Management and Financial Institutions*. Third edn, Pearson.

This book is available as an e-book in the VUW library.

Further books which may provide useful background for the course include:

- C L Culp (2002), *The ART of Risk Management*. Wiley.
- F X Diebold, N A Doherty and R J Herring (2010), *The Known, the Unknown and the Unknowable in Financial Risk Management*. Princeton.
- M Naylor (2005), *Risk Management and Insurance in New Zealand*. Thomson.
- J Teale (2008), *Insurance and Risk Management*. Wiley.
- B Tuckman and A Serrat (2012), *Fixed Income Securities: Tools for Today's Markets*. Third edn, Wiley. Also available as an e-book in the VUW library.
- E J Vaughan and T M Vaughan (2014), *Fundamentals of Risk and Insurance*. 11th edn, Wiley.

The first and second editions of Hull's book (2007, 2009) are less suitable for the course, inasmuch as the third edition contains some new material which is incorporated into the course.

Materials and Equipment

The second assignment may involve the use of the computer suite R, available to students in RWW 202. If they wish, students may download R onto their own computers: it is open-source software, available free from <http://www.r-project.org/>. No previous knowledge of R is assumed, and notes for the downloading and use of R are available on blackboard. Assistance with R is available through tutorials in weeks 2, 4 and 5, with timing and venue of the tutorials to be decided after consultation with the class.

Assessment

- 20% Two assignments, each worth 10%;
the first submitted to blackboard at the end of week 3, Friday 29 July; and
the second to Box 29 by the end of week 6, Friday 19 August 2016.
- 50% Two essays, each of length 3500-4500 words, each worth 25%;
to be submitted electronically to blackboard at the end of weeks 8 and 11,
Friday 16 September and Friday 7 October 2016.
- 30% Two hour final examination; during the examination period,
Friday 21 October - Saturday 12 November 2016 (inclusive).

All CLOs are addressed by the exam; essays will typically address CLOs 3, 4 and 6; and assignments will address CLOs 1, 2 and 5.

The assessment handbook will apply to all VUW courses: see
<http://www.victoria.ac.nz/documents/policy/staff-policy/assessment-handbook.pdf>

Penalties

Except in the matter of illness (for which a doctor's certificate is required), or other highly exceptional circumstances, marks for essays and assignments are reduced by 5% for each day late.

Failure to obtain approval by email of the essay topic by the due date may cause the mark for the essay to be reduced by 5% for each week late.

Essays and assignments appearing to be copied will be marked as zero. Appeals on marking may be made to the coordinator in the first instance, and to the Head of School if there is still disagreement.

Use of Turnitin

Student work provided for assessment in this course may be checked for academic integrity by the electronic search engine <http://www.turnitin.com>. Turnitin is an on-line plagiarism prevention tool which compares submitted work with a very large database of existing material. At the discretion of the Head of School, handwritten work may be copy-typed by the School and subject to checking by Turnitin. Turnitin will retain a copy of submitted materials on behalf of the University for detection of future plagiarism, but access to the full text of submissions will not be made available to any other party.

Examinations

Students who enrol in courses with examinations are obliged to attend an examination at the university at any time during the formal examination period. The final examination for this course will be scheduled at some time during the following period:

Friday 21 October - Saturday 12 November 2016 (inclusive)

Mandatory course requirements

Submission of both essays and attendance at the exam are compulsory.

If you cannot complete an assignment or sit a test or examination, refer to www.victoria.ac.nz/home/study/exams-and-assessments/aegrotat

Class representative

A class representative will be elected in the first class, whose name and contact details will be made available to VUWSA, the Course Coordinator and the class. The class representative provides a communication channel to liaise with the Course Coordinator on behalf of students.

Communication of additional information

Additional information will be conveyed to students via Blackboard.

Student Feedback

Student feedback on University courses may be found at www.cad.vuw.ac.nz/feedback/feedback_display.php

Link to general information

For general information about course-related matters, go to <http://www.victoria.ac.nz/vbs/studenthelp/general-course-information>

Note to Students

Your assessed work may also be used for quality assurance purposes, such as to assess the level of achievement of learning objectives as required for accreditation and academic audit. The findings may be used to inform changes aimed at improving the quality of VBS programmes. All material used for such processes will be treated as confidential, and the outcome will not affect your grade for the course.

1. rm overview, template, Macnamee (oznz rm standard); Roberts and libuser. ex-post, ex ante. The role of rm in public service, corporations; IFRS; MG
2. insurance
 - (a) general insurance, frequency/severity; → risk quantification
 - i. big claim: within existing model? premium up or not?
 - ii. VaR, ES, economic capital, RAROC: B2/3 and S2
 - (b) life insurance, policy/surrender value; money purchase, defined benefit
 - (c) reinsurance, time and motion, Lloyds; captives
 - (d) ART, ILSs, cat bonds
 - (e) HIH
3. GFC, krugman, madrick, blinder, etc, friedman, packer etc
 - (a) BNZ/sandls
 - (b) shadow banks
 - i. recourse rule, 2000 act to say derivs unregulated
 - (c) securitisation, MBSs, CDOs, CDSs,
 - (d) QE, Fannie mae
 - (e) case studies from the GFC: Citi, JPM, AIG
4. derivatives
 - (a) repos, (asset) swaps, libor
 - (b) OTC - exchange traded: developments in light of Frank Dodd: Hull, Billio
 - (c) default
 - i. developments in credit risk/derivatives over time: rowe and day
 - ii. actuarial approach: risk metrics, risk of default: MFE
5. Enron, SARBOX, Partnoy, ISDA
6. HFs; LTCM
7. dark pools
8. regulation
 - (a) Basel, Dodd Frank, Solvency 2
 - (b) B2/3, S2: VaR; capital, liquidity constraints
 - i. larger players benefit, own models? validity thereof?
 - ii. large players co-operate with regulators
 - (c) rating agencies

9. 307: Exx: 1a general insurance, 1b life, 1c reinsurance; lognormal
413: Ex 2: historical VaR, for one company, before and including GFC; bonus for
2 companies, portfolio of two companies. lognormal

10.

11.

1. **2015 307** rm overview, template (vol=risk, VaR)
2. general insurance, exposure, VaR
3. life insurance, traditional policies, policy values, lognormal discounting
4. libor, swaps; CDOs, CDSs, cat Bonds
5. OTC, exchange traded derivatives: hull (liquidity/capital), billio
6. HIH now, MG later?

Easter

6. sandls, gfc
 7. gfc, hedge funds
 8. solvency, regulation
 9. dark pools
 10. Basel, Volcker, Dodd Frank, solvency 2
 11. revision
 12. revision
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1. **2014 307** intro, scope of rm; (losses, etr; content of rm courses)
 2. case studies: MG, HIH. (duration, vol, vol derivs??) (perilous/prudent: no)
 3. insurance, prems, losses, etr, VaR (economic capital, RAROC)
 4. duration; vol (implied, realised, conditional vol, (=GARCH))
 5. libor, swaps, CDOs, CDSs, cat bonds
 6. sandls, GFC
 7. case studies from the GFC (Citi, JPM, AIG)
 8. HFs (and LTCM)
 9. case studies of HFs
 10. Regulation, SARBOX, Basel, Volcker (compliance; Gramm Leach Bliley, S 2)
 11. case studies: HIH, OC (more recent, WCom, AIG??)
 12. revision

1. **2015 413** rm overview, template (vol=risk, VaR)
2. HIH now, MG later?

old

1. **2014 413** rm overview, template (vol=risk, VaR)
2. perilous and prudent, sandls (etr, loss distn)
3. repos, swaps, CDSs, CDOs, MBSs
4. sandls, GFC
5. GFC (possible egg = CITI, JPM, AIG)
6. ART, cat bonds, captives
7. LTCM, HFs
8. Enron
9. regulation, Basel, solvency 2
10. compliance, SARBOX, Volcker, (GLB)
11. WCom, AIG
12. revision

1. **2014 413** rm overview, template (vol=risk, VaR)
 2. perilous and prudent, sandls (etr, loss distn)
 3. repos, swaps, CDSs, CDOs, MBSs
 4. sandls, GFC
 5. GFC (possible egg = CITI, JPM, AIG)
 6. ART, cat bonds, captives
 7. LTCM, HFs
 8. Enron
 9. regulation, Basel, solvency 2
 10. compliance, SARBOX, Volcker, (GLB)
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1. **2014 307** intro, scope of rm; (losses, etr; content of rm courses)
 2. case studies: MG, HIH. (duration, vol, vol derivs??) (perilous/prudent: no)
 3. insurance, prems, losses, etr, VaR (economic capital, RAROC)
 4. duration; vol (implied, realised, conditional vol, (=GARCH))
 5. libor, swaps, CDOs, CDSs, cat bonds
 6. sandls, GFC
 7. case studies from the GFC (Citi, JPM, AIG)
 8. HFs (and LTCM)
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 11. case studies: HIH, OC (more recent, WCom, AIG??)
 12. revision

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alternative reinsurance capital providers, insurance linked securities. discipline in global reinsurance markets in 2013.

jpmorgan's 13 bn fraud settlement with US govt: to be reviewed by court before proceeding?

BCBS finalises rm guidelines on AML = anti money laundering, and terrorist financing. management of risks related to these within the overall rm framework.

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Will Leckie 2014 suggestions for content

macro prudential

Useful links on the RBNZs new macro-prudential policy measures.

Speeches Graeme Wheeler and Grant Spencer good review of LVR policy\\
http://www.rbnz.govt.nz/research_and_publications/speeches/2013/5407267.h
http://www.rbnz.govt.nz/research_and_publications/speeches/2014/5671627.p

Total overview of NZ Central banking system
http://www.rbnz.govt.nz/financial_stability/financial_stability_report/fs

Macro Prudential Policy\\
http://www.rbnz.govt.nz/research_and_publications/fact_sheets_and_guides/
http://www.rbnz.govt.nz/financial_stability/macro-prudential_policy/52666
http://www.rbnz.govt.nz/financial_stability/macro-prudential_policy/
http://www.rbnz.govt.nz/financial_stability/macro-prudential_policy/51636

I will also have a think of other potentially useful topics.

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matt smith

Credit rating agencies. Big 3 S&P, Moodys and Fitch. Who are they and what do they do? Scrutiny from the GFC, why the ratings were misleading.

History of NZ banking industry. Consolidation, regulation and foreign ownership. BNZ needed to be bailed out in early 90s.

Development of the NZ accounting industry in light of things like the GFC. Self-regulation, change to IFRS etc.

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Mark Fowler

I was thinking a possible topic for class could be the start of the withdrawal of the qualitative easing in the US by the Federal Reserve and the potential risks to both interest rate markets and the wider US recovery. They are currently half way through the tapering process and at this stage it hasn't had the impact many thought. Just a suggestion but do think it poses some potential risks and I think is an interesting discussion piece.

tentative programme

wk 9.

basel 1, 2, 3; macroprudential

RB FSR §7; leakage LVR

'macroprudential' in google - wikipedia

wk 10.

SOX; Dodd frank; Volcker Rule

quantitative easing - poole paper

wk 11.

insurer solvency, solvency 2

NZ situation for insurer solvency: RB FSR §7 again

ratings bureaux

nz banks since 1980s, BNZ rescue in 1989

dark matter, dark pools, high frequency traders: equity trading on non-public fora
Calum Anderson. article by peter Yeoh on dark pools

lehman brothers: tudor chifu 307 2014 good essay

AIG ass 3 in 307 2014: matthew lynch, adam benseman, hilary beattie, anna kour-sukova, chidu mukesh.

chidu mukesh 317 2014: good references for dodd frank, from morrison foerster web site. Dodd Frank, shadow banking under yarns/GFC. For Dodd Frank, also senate summary of its main features.

Stella Chisholm: ART good essay 307 2014

jonathan cocker libor good essay 307 2014

citigroup. my summary also under yarns/GFC

Fannie Mae taught. sources?

tripe and roberts?

libor for 2015: ocampo, steel, etc, 307 2014

contracts for differences, CFDs, camila plata valencia, 307 2014

dark pools, calum anderson

2015 content

Date, 2015	Week	Theme	Essay	Ass set due
2 - 6 March	1	RM overview, template		
9 - 13 March	2	Perilous and Prudent, Savings & Loan		1
16 - 20 March	3	Savings & Loan, GFC		
23 - 27 March	4	Financial securities: CDOs, CDSs etc.		2 1
30 March - 3 April	5	GFC	A1	
<i>Mid-trimester break, 2 weeks: Monday 6 April - Friday 17 April 2015</i>				
20 - 24 April	6	VaR; ART, cat bonds, captives		2
27 April - 1 May	7	Hedge Funds, LTCM		
4 - 8 May	8	LTCM; Enron	E1	
11 - 15 May	9	Enron; Dark Pools	A2	
18 - 22 May	10	Regulation: Basel 2/3, Solvency 2		
25 - 29 May	11	Dodd Frank		
1 - 5 June	12	Revision	E2	

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Course Content 413 2014, 2013

Date, 2014 413	Week	Theme	Essay	Ass set due
3 - 7 March	1	RM overview, template; volatility, VaR		
10 - 14 March	2	Perilous and Prudent, Savings & Loan		1
17 - 21 March	3	financial securities in RM: CDOs, CDSs etc.		
24 - 28 March	4	Savings & Loan, GFC		2 1
31 March - 4 April	5	GFC	A1	
7 - 11 April	6	ART, cat bonds, captives		2
14 - 18 April	7	LTCM, Hedge Funds		
<i>Mid-trimester break, 2 weeks: Monday 21 April - Friday 2 May 2014</i>				
5 - 9 May	8	Enron	E1	
12 - 16 May	9	Regulation; Basel	A2	
19 - 23 May	10	Compliance: SARBOX, Volcker		
26 - 30 May	11	Worldcom, AIG	E2	
2 - 6 June	12	Revision		

Date, 2013 413	Week	Theme	Essay	Assignments set submit
4 - 8 March	1	RM overview, template		
11 - 15 March	2	Perilous and Prudent		1
18 - 22 March	3	Savings and Loan crisis		
25 - 27 March	4	Capital, exposure, losses		2
<i>Easter break, 1 week: Thursday 28 March - Wednesday 3 April 2013</i>				
4 - 5 April	4			1
8 - 12 April	5	ART, cat bonds, captives	A1	
15 - 19 April	6	Enron		2
<i>Mid trimester break, 1 week: Monday 22 - Friday 26 April 2013</i>				
29 April - 3 May	7	Volatility, vol derivatives	A2	
6 - 10 May	8	Repos, swaps, CDSs, MBSs	E1	
13 - 17 May	9	LTCM		
20 - 24 May	10	Basel Accords		
27 - 31 May	11	Solvency Two	E2	
3 - 7 June	12	No Lecture: Queen's Birthday		

Course Content 2014 307

Date, 2014	Week	Theme	Essay	Ass set due	Tuts
3 - 7 March	1	Introduction			
10 - 14 March	2	Characteristics of risk management		1	
17 - 21 March	3	Case studies: MG, Barings			Tut
24 - 28 March	4	Insurance, reinsurance		2	1 Tut
31 March - 4 April	5	Loss distributions, premiums			Tut
7 - 11 April	6	Economic capital, RAROC, VaR	App		2 Tut
14 - 18 April	7	Hedge Funds		3	
<i>Mid-trimester break, 2 weeks: Friday 18 April - Friday 2 May 2014</i>					
5 - 9 May	8	Libor, swap rates; duration			
12 - 16 May	9	Global Financial Crisis			3 Tut
19 - 23 May	10	Case studies: Citigroup, AIG, HIH	Due		Tut
26 - 30 May	11	Regulation, Compliance			Tut
2 - 6 June	12	Revision			Tut

extra bits: 413/522

Date, 2013	Week	Theme	References	Essay	Ass set sub
4 - 8 March	1	RM overview, template	macnamee, T		1
11 - 15 March	2	Perilous and Prudent	roberts & libuser		
18 - 22 March	3	Savings and Loan crisis	LR		2 1
25 - 27 March	4	Capital, exposure, losses	LR, H2		
<i>Easter break, 1 week: Thursday 28 March - Wednesday 3 April 2013</i>					
4 - 5 April	4				1
8 - 12 April	5	ART, cat bonds, captives	Lam, sigma, LR	A1	2
15 - 19 April	6	Enron	Maclean & Elkind		
<i>Mid trimester break, 1 week: Monday 22 - Friday 26 April 2013</i>					
29 April - 3 May	7	Volatility, vol derivatives	LR, H4	A2	
6 - 10 May	8	Repos, swaps, CDSs, MBSs	TS	E1	
13 - 17 May	9	LTCM	LR		
20 - 24 May	10	Basel Accords	H		
27 - 31 May	11	Solvency Two	LR, H12, H13	E2	
3 - 7 June	12	QB			

307: 2-3 k

413: 2.5-3.5

522: 3.5-4.5

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You should expect to spend about 10-12 hours per week reading, studying and completing essays and assignments. Overall it is expected that you will spend approximately 150 hours on completing this course.

14-15, 200 for 522.

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assessment requirements. include dates for assignments and essays

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307: box 40

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change contents, in particular change case studies.

for course outline 413

1. rm overview, template (macnamee, teale)
2. perilous and prudent
3. sandls (bnz)
4. capital, exposure and losses (insurance, and sigma data)
5. ART, cat bonds, captives
6. Enron
7. vol in in 413: derivs, implied, realised
8. repos, swaps, CDSs, MBSs (credit risk)
9. LTCM (hedge funds, mutual, lirr)
10. Basel accords
11. solvency 2
12. QB

outline 307: assignments one week later?

1. intro
2. characteristics of rm (rm fundamentals)
3. cs: mg, barings
4. insurance (fundamentals, sigma data)
5. loss distns, premiums
6. economic capital and raroc H23; VaR
7. hedge funds
8. libor and swap rates H8.2, duration 8.3
9. GFC
10. hih, OC
11. regulation
12. revision, vol out in 307

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assignments in 522 for 2015

email to Dawn of 9 feb 2015:

Assignment 1 is in R, simulating insurance claims, discounting them and calculating the Value at risk and expected shortfall. There will be some comments required in interpreting the output. Each student will have his/her own data generated. I think it is a manageable amount of work for 5%. They will be encouraged to download R before the course starts, and again in the first lectures. I shall put notes on bbd about downloading R. Mohammed Khaled is using R for the quan courses, so there is some momentum in using R. I think Yigit is using R for teaching, and I use it in all of my courses.

Students are encouraged to share R code, and to help each other with R: in fact I shall give the basic code to them, which they need to cut and paste, or the equivalent. They can also come to see me for any help with R.

students might choose not to do anything in R, but they will lose 5%. The idea is to encourage them to become a little more quantitative, at least to the extent of calculating simple risk management tools; also the little bit of R they do will encourage them somewhat in the computing quantitative direction.

I shall provide the basic code: all they have to do for the initial part of assignment 1 is to cut and paste the code, plot the result and give to me as a hard copy or whatever. There is no point in getting them to submit a maths type of assignment through bbd. Comments on the results will be required. To get a better mark they can do a bit of programming in R themselves.

For assignment 2, I could offer a choice between doing further work on the above simulation, perhaps predicting balance sheets or varying the procedure a bit. Another possibility is to emulate what I am doing in 307, and get them to calculate a VaR for an investment portfolio, taking the historical data from yahoo.finance, for companies which will differ from student to student.

OR

I could give the option of eschewing R for the second assignment and setting a short mini-essay on libor or whatever. This allows a student to omit all work on R at the expense of 5%.

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One problem that I face again this year is what to do, if anything, about people who choose a topic for an essay, and then choose the same topic on the exam. I would like to outlaw this, but I am not sure how to go about it. For instance, lots of essays will

be chosen with the GFC as the topic, and it also has to appear in a couple of exam questions. There are of course many aspects of the GFC that are of relevance, but this is still a problem.

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