Introduction to Academic Writing and Presentation

AI Hub -Academy and Research (4)

GEC Academy

Jiayi Zhu

Last Lecture

- Database: Web of Science

- Evaluation: JCR

- Comparison: SCI SSCI EI Publisher Journal

Today

- How to Prepare an Academic Paper?

- ## Paper Outline

- **Title and Keywords**
- **Abstract (150/200~300 words)**

  Free but Important

- **Introduction (10%~15%)**

  Cause

- **Data and Method (25~30%)**

  Feasibility

- **Results and Discussion (35~50%; 15%~20%)**

  Effect

- **Conclusion (<10%)**

  Advantage (Innovation)

- **Acknowledgement**

- **Reference**

A full-length article: 5000 words or 10 pages printed in journal
A shorter research letter (3000 words)

- ## Paper Format : Title

— *Precise: Concise and informative*

— *Attractive: Appropriate for intended audience*

— *The subject matter of the article*

1986
A NINE VARIABLE PROBABILISTIC MACROECONOMIC FORECASTING MODEL

1989
ALTERNATIVE EXPLANATIONS OF THE MONEY—INCOME CORRELATION

1994
EVIDENCE ON STRUCTURAL INSTABILITY IN MACROECONOMIC TIME SERIES RELATIONS

1997
MODELLING INTEREST RATES WITH A COINTEGRATED VAR-GARCH MODEL

2006
The price of terror: The effects of terrorism on stock market returns and volatility
K. Peren Arin [a,b], Davide Ciferri [c], Nicola Spagnolo [b,d,*]

Paper Format --Abstract

Abstract

We use a bivariate VAR model to model and predict the joint evolution of short term and long term interest rates. We introduce a GARCH effect on the innovations of the model in order to account for the changing volatility of the series. We test the cointegration of the two interest rates, which is implied by a present value relation between the rates. The cointegration test is done both with and without taking account of the GARCH effect. The empirical results for five countries (Belgium, Germany, France, Great Britain and the USA) point to the same conclusions: i) the incorporation of the GARCH part allows to conclude more clearly that a cointegration relation exists; ii) GARCH effects are quite present; and iii) the models are useful for short term predictions of interest rates.

Purpose/Objectives Highlights the novelty and significance of the work

Methods

Results and Conclusions

Non-standard or uncommon abbreviations should be avoided

200~300 words (Keep in accordance to the journal policy or other specific abstract requirements)

- ## Paper Format--Introduction

1 Introduction

Markowitz(1952) proposes the Mean-Variance model for portfolio investment. Based on that, Sharpe(1964), Lintner(1965) and Mossin(1966) suggests the Capital Asset Pricing Model (CAPM). CAPM studies the relationship between portfolio returns and market returns, which becomes one of the important benchmarks in modern finance theories. In empirical finance, the beta coefficient calculated from CAPM is widely used to measure risk. For example, the beta value for every stock listed is reported on finance.yahoo.com.

Since then, there are many reasearches about CAPM. Table 1 lists the researches about CAPM in recent years. Panel A are the researches written or published in English. Panel B are those in Chinese. Some researchers try to make some extensions on CAPM. For example, Lucas(1978), Breeden(1979), Grossman(1981) and Shiller(1981) propose consumption CAPM (CCAPM). Black(1976), Lee(1986) and Gweon(1986) suggest wealth CAPM (WCAPM). Fama and French(1997) extend CAPM to a 3-factor model. Jin(2011) suggests a CAPM-AEPD model and estimates it using Maximum Likelihood Estimation Method. In his pape, he finds out CAPM-AEPD explains the stock market returns better than CAPM in China and US stock market.

To answer previous two questions, we analyze 4 sovereign CDSs including UK, France, German and Italy. Sample period is from August 5, 2011 to August 5, 2012. We use Method of Maximum Likelihood (MLE) to estimate the parameters by MatLab program. Akaike Information Criterion (AIC) is used to choose between models. Kolmogorov-Smirnov test is used for residual check. Hypothesis testing on parameter restrictions are based on the Likelihood Ratio test.

History
Background

Present
Objective/Motivation: the major gaps your research aims to fulfil in

Future
Overview: method,empirical practice, conclusion

Every sentence must be supported by Citation/Data/Findings

Paper Format--Introduction

Author(Year)	Model&Methodology	Country	Sample Period
Panel A: Written in English			
Markowitz(1952)	Mean-Variance Model	-	-
Sharpe (1964)	CAPM	-	-
Merton (1973)	ICAPM	-	-
Black(1976)	wealth CAPM	-	-
Lucas (1978)	CCAPM	-	-
Grossman et.al. (1981)	CCAPM	US	1890-1979
Gultekin et.al. (1985)	APT, CAPM	US	1960-1979
Fama et. al. (1993)	3-factor model	US	1962-1989
Groenwolda et.al(1999)	CAPM	Austrialia	1979:12-1994:2
Gonzalez(2001)	CAPM	Venezuela	1992:4-1998:8
Bartholdy et.al.(2005)	CAPM, FF	US	1970-1996
Söderlind (2006)	CCAPM	US	1947:1-1956:4
Ziegler et al. (2008)	CAPM, Multifactor Model	Europe	1996:1-2001:8
Lee et.al.(2009)	Dynamic CAPM	SP500	1981:1-2002:4
Low et.al.(2009)	CAPM	US	1926:1-2003:12
Hwang et.al.(2010)	CAPM	US stock, bond	1934:1-2006:1
Los Rios et.al. (2011)	CAPM-SDF	Europe,US	1994:1-2008:6
Chen et al. (2011)	Three moment CAPM	China	1995:1-2007:12
Ki(2011)	CAPM	US	1994:6-2010:12
Hodgseon et.al.(2012)	CAPM	Canada	1968-2008
Chen et. al.(2012)	CAPM-GARCH	US	2001:1-2010:3
Panel B: Written in Chinese			
Chen and Sun (2000)	CAPM	China	1994:9-1998:10
Wu and Xu (2004)	CAPM, 3-factor model	China	1995:2- 2002:6
Su and Zhang(2007)	Markov-CAPM	Shenzhen	1995:1-2006:4
Li and Ni(2008)	CAPM, Structure break	IBM	1978:1-1987:12
Ding(2009)	CAPM	Shenzhen	2000:1-2005:12
Ni and Yu (2009)	CAPM	China Sectors	2005:1-2009:4
Zhang (2009)	Regime Switching CAPM	China	2006:8-2008:11
Li and Wang(2011)	Extended CAPM	China	2005:1-2009:12
Jin(2011)	CAPM-AEPD	China, US	2006:1-2010:12
Dai and Chen (2011)	CAPM-WNN	China	2007:1-2011:2
Deng(2011)	CAPM	China	2006:1-2010:12
Zhang and An(2011)	CAPM	Shanghai	2007:12-2010:11
Wang and Qian(2011)	CAPM	China SJ stocks	2008:11-2009:6
Zhang et al. (2012)	CAPM	China	2007-2011
Li and Yang(2012)	CAPM-AEPD	Hongkong	2006:1-2010:12
Wang(2012)	CAPM	Shanghai	2008:1-2011:1
Deng(2012)	CAPM	China Bank Sector	2009:1-2011:1

Paper Written in English from Web of Science

Paper Written in Chinese from CNKI

- ## Paper Format -- Methodology

2 **Model and Methodology**

2.1 CAPM-AEPD

2.2 CAPM-Normal

2.3 Method of Maximum Likelihood Estimation(MLE)

Method of Maximum Likelihood Estimation (MLE) is used to estimate the parameters. The maximum likelihood function of the CAPM-AEPD model is

$$L(R_1 - R_{f1}, ..., R_t - R_{ft}, R_{m1} - R_{f1}, ..., R_{mt} - R_{ft}; \theta) = \prod_{t=1}^{T} f(R_t - R_{ft})$$

$$= \prod_{t=1}^{T} \begin{cases} \left(\frac{\alpha}{\alpha^*}\right) \frac{K(p_1)}{\sigma} exp\left(-\frac{1}{p_1} \left|\frac{u_t - \mu}{2\alpha^* \sigma}\right|^{p_1}\right), & u_t \leq \mu, \\ \left(\frac{1-\alpha}{1-\alpha^*}\right) \frac{K(p_2)}{\sigma} exp\left(-\frac{1}{p_2} \left|\frac{u_t - \mu}{2(1-\alpha^*)\sigma}\right|^{p_2}\right), & u_t > \mu, \end{cases}$$

$$u_t = (R_t - R_{ft}) - \beta_1 - \beta_2(R_{mt} - R_{ft}).$$

Discuss the methods you employed to achieve each topics

- ## Paper Format --Methodology

$$L(R_1 - R_{f1}, ..., R_t - R_{ft}, R_{m1} - R_{f1}, ..., R_{mt} - R_{ft}; \theta) = \prod_{t=1}^{T} f(R_t - R_{ft})$$

$$= \prod_{t=1}^{T} \begin{cases} \left(\frac{\alpha}{\alpha^*}\right) \frac{K(p_1)}{\sigma} exp\left(-\frac{1}{p_1}\left|\frac{u_t - \mu}{2\alpha^*\sigma}\right|^{p_1}\right), & u_t \le \mu, \\ \left(\frac{1-\alpha}{1-\alpha^*}\right) \frac{K(p_2)}{\sigma} exp\left(-\frac{1}{p_2}\left|\frac{u_t - \mu}{2(1-\alpha^*)\sigma}\right|^{p_2}\right), & u_t > \mu, \end{cases}$$

$$u_t = (R_t - R_{ft}) - \beta_1 - \beta_2(R_{mt} - R_{ft}).$$

Appendix

1. **Markov Chain Monte Carlo (MCMC) algorithm to draw t**

GC_SSAEPD

In this paper, we use Markov Chain Monte Carlo (MCMC) algorithm to

GC_SSAEPD. The process is as follows.

1. Select a set of true parameter values for $\theta = (\alpha_1, p_{11}, p_{12}, \alpha_2, p_{21}, p_{22},$
2. Assume values $u_1^{(i)}, u_2^{(i)}$ are knows (if $i = 0$, set $u_1^{(0)} = u_2^{(0)} = 0$)
3. Generate a random variable from SSAEPD (α, p_1, p_2) by method in J

Sufficient detail about your analysis (to use the Supplementary Document)

Paper Format --Data

Table 3: Descriptive Statistics

	Mean	Med.	St.De.	Ske.	Kur.	P
G7index	-.0017	-.0015	.0317	-.3318	6.0456	0
UK	-.0020	-.0011	.0508	-7.0587	88.4631	0
France	0	.0002	.0414	-.2131	4.6480	0
German	-.0008	0	.0384	-.1722	5.4542	0
Italy	.0017	.0010	.0375	-.4443	4.6027	0

Introduce the data information, and data processing methods

The Market iTraxx SovX G7 Index(denoted as G7index) is used as the market index. Data is downloaded from Bloomberg database. The sample period is from August 5, 2011 to August 5, 2012. The CDS returns are the log returns and are calculated by following formula:

$$R_{i,t} = lnP_{i,t} - lnP_{i,t-1}.$$

Paper Format --Result

Table 4: Estimates for Parameters

	β_1	β_2	α	p_1	p_2	μ	σ
			Panel A: CAPM-AEPD				
UK	.2259	.2008	.5273	1.0962	.7600	-.2268	.0150
France	.0658	.6771	.4422	2.0488	1.8597	-.0723	.0277
German	-7.3634	.3246	.5660	1.2811	.9854	7.3665	.0289
Italy	.0322	1.5871	.4972	1.7705	1.7246	-.0310	.0113
			Panel B: CAPM-Normal				
UK	.0004	.2591	.5	2	2	.0002	.0249
France	-.0007	.6584	.5	2	2	-.0002	.0282
German	-.0009	.3525	.5	2	2	0	.0377
Italy	.0012	1.5986	.5	2	2	.0002	.0119

Note: -1E-18=-1×10^{-18}.

Table 5: Likelihood Ratio Test (LR) for CDS

	Panel A: Significance Tests		Panel B: Parameter Restriction Tests					
	H1	H2	H3	H4	H5	H6	H7	H8
UK	9.38	26.20	141.64	105.64	57.08	66.18	73.52	.45
France	.00	46.24	46.24	3.48	.02	15.82	.02	69.58
German	.00	28.72	24.06	49.68	9.08	18.44	18.46	17.68
Italy	211.06	250.46	250.90	1.22	54.86	4.86	1.20	67.54
$\chi^2_{.05}$	3.84	3.84	5.99	7.84	3.84	3.84	5.99	3.84

- *Results should be clear and true.*

- *Avoid extensive citations and discussion of published literature.*

- *Present your results in figures or tables and discuss the results shown on each figure and table.*

Good Table

Table 2. Planting date, mean planting density, and total number of seed clams planted in plots at Filucy Bay and Wescott Bay in 1979.

Location	Plot code	Planting date	Mean planting density in no. clams/m^2 + 1 st. dev.(N)	Total no. clams planted
Filucy Bay	F10 x 30	5-16-79	994 ± 39(5)	298200
	F3 x 10	5-24-79	994 ± 39(5)	29820
Wescott Bay	W10 x 25	5-16-79	994 ± 39(5)	248500
	W3 x 10	6-2-79	895 ± 35(5)[a]	26850

[a]Calculated after clams were planted based on estimated 11% mortality of seed clams between 5-24 and 6-2-79.

Annotations:
- Units included
- Legend- complete / Legend above the table
- Note capitalization
- Lines of demarcation separate numerical data from text.
- Note clarifying footnote

Good Line
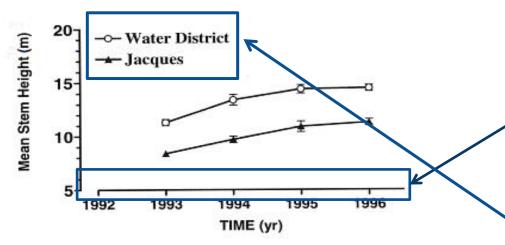
Figure 6. Primary growth (stem height) of White pines at two sites near Lake Auburn, Maine, based upon random samples of trees using transect methods ('93 and '94) and point plot surveys ('95 and '96). Error bar=SEM. Minimum sample size was 43 trees (Water District '95).

Y changes as a function of X

Show data collected at regular intervals (show trends)

Plot the length of intervals so that slopes are not too steep

Make curves most bold

Don't vary line patterns, vary symbols

- Bar Charts

Use color only in slides/ posters. Use conservative patterns for publication

One measurable axis

Show significant differences by letter or asterisk above bars

Interval doesn't matter Make bars wider than the spaces between them.
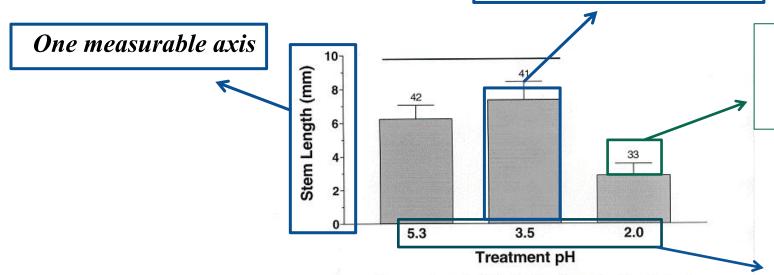
Figure 1. Mean stem length (± 1 SD) of seedling clover watered to soil saturation daily for 2.5 weeks with simulated acid rain of varying pH. The control (pH 5.3) was normal city tapwater. The pH 3.5 and 2.0 water was acidified with 2 M sulfuric/ 1 M nitric acid solution. Line over bars indicates groups which were not significantly different (Kruskal-Wallis Test and Dunn's Multiple Comparison's Tests). Number over bar indicates sample size.

- ## Paper Format --Discussion

We use EViews6.0 to estimate parameters of the four marginal distributions. The results are displayed in Table 9. The ARMA terms are significant autoregressive terms and reject the null hypothesis at significance level of 0.05. Both ARCH and GARCH terms for $\{r_{yt}^A\}$, $\{r_{xt}^B\}$, and $\{r_{yt}^B\}$ are strongly significant at 0.05 level, indicating heteroskedasticity of data. Kurtosis parameters ν of the four marginal models range from 3.538 to 7.274, and skewness parameters λ range from -0.068 to 0.343. All of them reject the null hypothesis, meaning that the normal or Student-t distribution is not more appropriate than the skewed Student-t distribution to fit the residuals.

- Explain and explore the significance of the results of the work

- If some results did not work as you expected, explain why?

- Different from or similar to previous research?

• Paper Format --Discussion

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- ***Be straightforward***

Always present the most important results or findings in the first sentence and then followed by detailed explanations or comparative analysis

- ***Keep a clear logistical flow***

Be close to one aspect of results in one paragraph

Paper Format -- Conclusion

5 Conclusion

This paper has shown the feasibility of the bivariate modelling of interest rates using a VAR-GARCH model. The empirical findings of the papers are that:

(i) cointegration is not rejected by the data, this conclusion being stronger in the presence than in the absence of the GARCH part;

(ii) there are important GARCH effects, and in particular a GARCH(2,2) model is relevant for our data;

(iii) a diagonal GARCH model seems to be the exception rather than the rule;

(iv) the unconditional covariance matrix of the GARCH model may not exist;

(v) there may be a common factor driving the dynamics of the conditional second moments;

(vi) the VAR-GARCH model can be useful for predicting the interest rates, and seems to predict better long term interest rates than a pure VAR model.

- *You **SHOULD SUMMARIZE** the major method contributions and key findings in the conclusion part*

- *Different from abstract (more detail) and discussion (less detail)*

- *Advantage and Disadvantage*

- ## Paper Format-- Extension

Future extensions will include but not limited to follows. First, the sensitivity of our results can be tested by portfolios composed of different financial assets, such as stocks or bonds. Second, one can extend our bivariate case to multivariate copula case. Third, different algorithms can be tested to get the global optimum. Lastly, one can consider a copula with dynamics in the dependence structure to VaR estimation.

- ## Paper Format--Reference

Reference part is a must part.

All the content in your report from published literature

should be noted and listed in reference part.

[1] G. Eason, B. Noble, and I.N. Sneddon, "On certain integrals of Lipschitz-Hankel type involving products of Bessel functions," Phil. Trans. Roy. Soc. London, vol. A247, pp. 529-551, April 1955.

[2] J. Clerk Maxwell, A Treatise on Electricity and Magnetism, 3rd ed., vol. 2. Oxford: Clarendon, 1892, pp.68-73.

Indigo, A. C., and Mauve, B. E. 1994. Queer place for qwerty: gene isolation from the platypus. Science 275, 1213-1214.
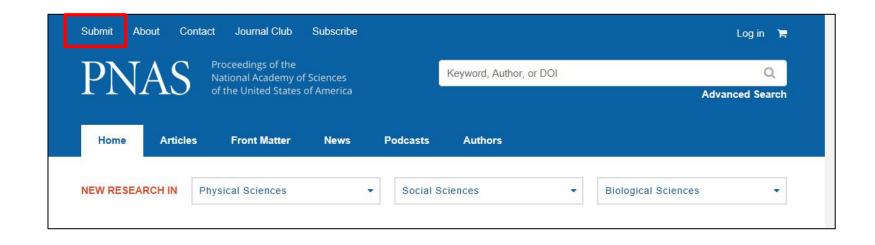
Magenta, S. T., Sepia, X., and Turquoise, U. 1995. Wombat genetics. In: Widiculous Wombats, Violet, Q., ed. New York: Columbia University Press. p 123-145.

Paper Format--Acknowledgement

We are grateful to Neil Shephard for helpful discussions and participants at the 14th Annual International Symposium on Forecasting in Stockholm, Sweden for useful comments. This research was supported by National Science Foundation grant no. SES-91-22463. This paper is part of NBER's research program in Economic Fluctuations. Any opinions expressed are those of the authors and not those of the National Bureau of Economic Research.

- *Your funding sources or support from other people who are not included in the author list.*

- *Clarification of the attitude of funders (usually not represent their official views) and authors' contribution.*

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