

Nasir Ganikhodjaev  
Farrukh Mukhamedov  
Pah Chin Hee

VOLUME 1

$$x' = 2xy$$

$$y' = 2xz$$

# INVESTIGATIONS ON PURE MATHEMATICS, FINANCE MATHEMATICS AND OPTICS

Proceedings of the Department of Computational  
and Theoretical Sciences Kulliyyah of Science, IIUM

$$\varphi_1(x, y, z) = z$$

$$\pi_1 = \begin{pmatrix} x & y & z \\ y & z & x \end{pmatrix}$$

$$z' = x^2 + y^2 + z^2 + 2yz$$

$$\pi_1 \nu_1 \pi_1 = \nu_{17}$$



الجامعة الإسلامية العالمية ماليزيا  
INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA  
يُونَيْتِي اِسْلَامًا اِنْتَارَا اِنْعَسَابًا مِلِّيْسِيَا

# **Investigations on Pure Mathematics, Finance Mathematics and Optics**

Nasir Ganikhodjaev  
Farrukh Mukhamedov  
Pah Chin Hee



IIUM Press

Published by.  
IIUM Press  
International Islamic University Malaysia

First Edition, 2011  
©IIUM Press, IIUM

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without any prior written permission of the publisher.

Perpustakaan Negara Malaysia

Cataloguing-in-Publication Data

Nasir Ganikhodjaev, Farrukh Mukhamedov & Pah Chin Hee. Investigations on Pure Mathematics, Finance Mathematics and Optics

ISBN: 978-967-418-198-7

Member of Majlis Penerbitan Ilmiah Malaysia – MAPIM  
(Malaysian Scholarly Publishing Council)

Printed by  
**IIUM PRINTING SDN.BHD.**  
No 1, Jalan Industri Batu Caves 1/3  
Taman Perindustrian Batu Caves  
Batu Caves Centre Point  
68100 Batu Caves  
Selangor Darul Ehsan

# Contents

Preface

## Part I Pure Mathematics Concentration

Chapter 1	THE BEHAVIOR OF TRAJECTORY OF $\xi^s$ QUADRATIC STOCHASTIC OPERATIONS	2
Chapter 2	THEORY OF MARKOV CHAINS IN PEDIATRIC DISEASES	8
Chapter 3	ON NONLINEAR DYNAMIC SYSTEMS ARISING IN POTTS MODEL	14
Chapter 4	THE FIRST RETURN TIME AND DIMENSION	22
Chapter 5	ON AS SOCIATIVE ALGEBRAIC STRUCTURE OF GENETIC INHERITANCE	31
Chapter 6	INTERACTING PARTICLE SYSTEM	37
Chapter 7	DYNAMICS OF GENERALIZED LOGISTIC MAPS	43
Chapter 8	GEOMETRIC BROWNIAN MOTION AND CALCULATION OF OPTION PREMIUM IN BLACK-SCHOLES MODEL	50
Chapter 9	ON THE ELEMENTARY CHARACTERIZATION OF PRIMES IN PRIMALITY TESTS: TWO SHORT STUDIES.	57
Chapter 10	ON ASSOCIATIVE ALGEBRAIC STRUCTURE OF GENETIC INHERITANCE	64
Chapter 11	SOME APPLICATION OF ERGODIC THEORY IN NUMBER THEORY	70
Chapter 12	STUDY OF ROLES OF EXTERNAL MAGNETIC FIELD ON ISING AND POTTS MODEL	76
Chapter 13	INVESTIGATION OF STABILITY OF FIXED POINTS OF NONLINEAR DISCRETE DYNAMICAL SYSTEMS	82
Chapter 14	MARKOV CHAINS AND ITS APPLICATION: THE INVENTORY MODEL	90
Chapter 15	PHASE TRANSITION FOR ISING MODEL WITH TWO COMPETING INTERACTION ON CAYLEY TREE OF ORDER 4	96
Chapter 16	LIMIT BEHAVIOR OF DYNAMIC SYSTEMS CORRESPONDING TO LATTICE MODELS WITH COMPETING PROLONGED AND ONE-LEVEL BINARY INTERACTIONS	101
Chapter 17	ASSOCIATIVE ALGEBRA IN GENETIC INHERITANCE	109
Chapter 18	ON $\xi^a$ -QUADRATIC STOCHASTIC OPERATORS AND THEIR CLASSIFICATIONS	115

## **Part II Finance Mathematics Concentration**

Chapter 19	ANALYZING THE PERFORMANCE OF INVESTMENT STRATEGY OF EPF	123
Chapter 20	PREDICTION OF STOCK PRICE USING NEURAL NETWORK	130
Chapter 21	COMPARISON BETWEEN CONVENTIONAL AND ISLAMIC BOND IN MALAYSIA	136
Chapter 22	STOCK PERFORMANCE ANALYSIS BETWEEN MALAYSIAN AIRLINES SYSTEM BERHAD AND AIRASIA BERHAD	144
Chapter 23	ISLAMIC PAWNBROKING (AR-RAHNU) AS A MICRO CREDIT INSTRUMENT IN MALAYSIA	151
Chapter 24	ANALYSIS OF CRUDE PALM OIL FUTURES PRICES TRADED ON BURSA MALAYSIA	160
Chapter 25	AN EMPIRICAL STUDY ON THE EFFICIENCY OF THE TRIM AND FILL METHOD IN CORRECTING PUBLICATION BIAS IN META ANALYSIS	166
Chapter 26	PERFORMANCE ANALYSIS OF INSURANCE AND TAKAFUL INDUSTRIES IN MALAYSIA	171
Chapter 27	ANALYSIS OF DATA USING MULTILEVEL MODELLING WITH MLwiN	179
Chapter 28	FINANCIAL PERFORMANCE OF ISLAMIC BANKING AND CONVENTIONAL BANKING IN MALAYSIA	186
Chapter 29	A STUDY ON THE EFFECT OF PUBLICATION BIAS IN META ANALYSIS	194
Chapter 30	RATIO ANALYSIS: BANK ISLAM MALAYSIA BERHAD (BIMB) & MALAYAN BANKING BERHAD (MAYBANK)	201
Chapter 31	AN ANALYSIS OF MALAYSIAN UNIT TRUST FUNDS: ISLAMIC VS CONVENTIONAL	207

## **Part III Optics Concentration**

Chapter 32	QUANTUM TRAJECTORY METHOD USING MPI PARALLEL COMPUTING	214
Chapter 33	LINEAR WAVE PROPAGATION IN SINGLE MODE OPTICAL FIBRE	220
Chapter 34	THE OPTICAL RAY TRACING TECHNIQUE IN LENS SYSTEM WITHIN AND BEYOND PARAXIAL APPROXIMATION	226
Chapter 35	WAVE PROPAGATION IN NONLINEAR AND HOMOGENEOUS MEDIA: KERR MEDIA	234
Chapter 36	MATRIX METHODS OF OPTICAL RESONATORS	240

# ANALYZING THE PERFORMANCE OF INVESTMENT STRATEGY OF EPF

Balqis Hisham  
Assist. Prof. Dr. Mohd Aminul Islam

**Abstract.** *This project aims to analyze the performance of investment strategy of Employee Provident Fund (EPF). EPF is a social security institution formed according to the Laws of Malaysia which provides retirement benefits for its members through management of their savings. The analysis is to trace how the investment made by EPF can generate income. The investment is made through approved financial instruments including Malaysian government securities, money market instruments, loans & bonds, equity and property. This study utilizes financial ratio analysis (liquidity ratio, leverage ratio and profitability ratio) to analyze the investment performance of EPF. The analysis shows that EPF has a strong financial position and can survive over a long period of time.*

## 1 Introduction of analysing performance

### 1.1 Business Performance

In order to analyze the business performance of EPF, the study focused on the five type of ratio analysis which are current ratio, total debt to asset ratio, total debt to equity ratio, return on asset ratio and also return on equity ratio. First is current ratio for which data is gathered from the balance sheet of EPF annual report. It is calculated by using the formula:

$$\text{Current ratio} = \frac{\text{Current assets}}{\text{Current liabilities}}$$

Current asset is expected to be sold or used up in the near future, usually within one year. It includes cash, account receivables, inventory and short term investment. While current liabilities is considered as a debt of the business that need to be settled in cash within a fiscal year. Therefore, analysis of the current ratio serves as an indicator to examine the company's liquidity.

Second is total debt to asset ratio for which data is taken from the balance sheet of EPF annual report. The formula used to calculate debt to asset ratio is as follows:

$$\text{Total debt to asset ratio} = \frac{\text{Total liabilities}}{\text{Total assets}}$$

Total liabilities are the total of all current liabilities, long term debt, and any other miscellaneous liabilities the company may have. Meanwhile, total asset is all economics resources own by EPF including current and long term assets. Total debt to asset ratio was examined to see how much a proportion of the EPF assets were financed through debt.

Third is total debt to equity ratio. The data is gathered from the balance sheet of EPF annual report. It is calculated by using the formula:

$$\text{Total debt to equity ratio} = \frac{\text{Total liabilities}}{\text{Total equity}}$$