Francis Babi
Curriculum Vitae

PROFESSIONAL PROFILE:

- **Applied Mathematician**
- **Financial Engineer**
- **Operations Researcher**
- **Academic, Lecturer and Mentor**
- **Qualified veterinarian**
- **Professional Consultant**

PROFESSIONAL BODY MEMBERSHIP

- **Actuarial Society of South Africa**
- **South African Veterinary Council**
- **Operations Research Society of South Africa**

PERSONAL STATEMENT MOTIVATION AND GOALS

I am an experienced and highly qualified professional with a strong background in actuarial sciences, applied mathematics, operations research, mathematical modeling, statistical modeling and the veterinary industry as well as the academic sphere. I have over 20 years' experience in leadership, research, extension and consultancy work.

As a qualified veterinarian I also possess various degrees in actuarial related fields as well as degrees and certificates in the veterinary sciences. I am passionate and competent in statistical and mathematical analysis whilst possessing profound astuteness in finance and quantitative analysis.

I have an impeccable work history spanning over 22 years much of it spent in management, research, lecturing and mentorship positions. I rose from being a state veterinarian in 1993 to being middle manager for the department of agriculture in the Limpopo province and current predictive analyst for Old Mutual Insure (formerly Mutual & Federal Insurance Company limited). I have been in this capacity concurrently together with my lectureship and research positions with the University of Limpopo, Pretoria and UNISA. Predictive modeling is a fairly new and booming field of practice within the South African financial industry and it has befallen my lot to be among its leaders.

I am an excellent communicator who loves challenges, am self-motivated with a firm conviction of succeeding in everything I do. In my current and previous endeavors I have not only achieved set targets but created benchmarks for others to follow.

As a natural leader and ambitious person, ideal position sought will be one that makes use of my resourcefulness, knowledge and passion. I regard myself to be a self-starter, leader and innovative pressure handling individual.

PERSONAL DETAILS

P.O Box 3245, Polokwane, 0700

Cell:	*0814411390*
Tell:	*015 292 3796*
E-mail:	
Sex:	*Male*
Nationality:	*South African*
Race:	*African*
Marital status:	*Married with 3 dependents*
Languages:	*English & Northern Sotho (Pedi)*
Drivers Licence:	*Defensive code EB driver*

PROFESSIONAL SKILLS

- *Actuarial Sciences*
- *Financial Engineering*
- *Computational Finance*
- *Financial Modeling*
- *Mathematical Modeling*
- *Risk management*
- *Exceptional Statistical and Mathematical analytical skills*
- *Excellent in managing and coordinating teams*
- *Expertise in needs assessment, research methods and data analysis*
- *Expertise in development, implementation and evaluation of agricultural projects*
- *Excellent veterinary clinical, veterinary public health and surgical skills*
- *Quality orientation and attention to detail*

PERSONAL SKILLS

- *Efficient and Organized*
- *Effective networking ability*
- *Excellent problem-solving ability*
- *Very good oral and written communication skills*
- *Multi-tasking ability*
- *Handles pressure well*
- *A team player who can work independently*
- *Proactive with initiative and drive*
- *Versatile client engagement ability*

PROFESSIONAL QUALIFICATIONS SUMMARY

- *Masters in Financial Engineering (Current Study) -UP*
- *Postgraduate Diploma in Risk Management (Current) - UNISA*
- *BSc Honours Financial Modelling*
- *BSc Mathematical Modelling*
- *MSc Veterinary Science (Veterinary Ethology)*
- *BVsc Honours Veterinary Science*
- *BVsc Veterinary Science*

CERTIFICATES

- *African Epizootic diseases 14/11/1996*
- *Parasitology: Vectors – and vector-borne diseases and integrated control 14/11/2014*

PROFESSIONAL EMPLOYMENT SUMMARY

Period *Position*

07/201 to Date **Quantitative Analyst Investments and Wealth FNB**

09/ 2014 ***Member of the UNISA Academic Advisory Group in the Department of Agriculture and Animal health (appointment position – non remunerating)***

2015 to Date ***Predictive Analyst (Old Mutual Insure – permanent position)***

2014 to 2015 ***Previous Limpopo Rabies Advisory Group Chairperson***

2008 to Date ***Actuary based consultative work***

2001 to Date ***External Examiner (Periodic)***

PROFESSIONAL EXPERIENCE

Position*:* ***Quantitative Analyst***

Employer*:* *First National Bank*

Period*:* *1 July 2018 to Date*

Scope of Work Done*:*

Increase operational efficiency and suggest solutions to enhance cost effectiveness.

- *Cultivate and manage objective working relationships with a variety of stakeholders, including end-users, project managers and senior staff members.*
- *Ensure stakeholder satisfaction by delivering a service that is consistent, seamless and error free.*
- *Maintain awareness of relevant legislation and industry best practices to provide proactive advice and solutions to relevant stakeholders.*
- *Retrieve and manipulate quantitative data into understandable format through extensive data mining and analysis to influence creative Business solutions and provide reporting.*
- *Responsible for model building and interpreting models in order to minimize risk and / or maximize revenue.*
- *Monthly monitoring of performance of scorecards and models.*
- *Research into best practices regarding the development, maintenance and use of statistical and behavioral scorecards.*
- *Manage personal development to increase own skills and competencies.*
- *Knowledge sharing within team and externally.*
- *To plan, build and implement innovative quantitative analytic methodologies, procedures, products and models within a broad framework in order to enhance and inform strategic decisions in FNB. To provide analytical support and interpret insights to address business opportunities and problems. May lead a team of Quantitative Analysts and provide input in the development of Quantitative Analysts and provide input in the development of quantitative frameworks and standards. Develops core analytical capabilities or model libraries, using advanced statistical, quantitative, or econometric techniques*
- *Team lead/Mentorship*
- *Self built model and implementation experience essential*

INTERESTS AND CAREER PATHING

- *Quantitative Analysis*
- *Predictive Modeling*
- *Quantitative Risk Analysis and Management*
- *Financial Modeling*
- *Statistical Modeling*
- *Mathematical Modeling*
- *Mathematical and Computational Finance*
- *Financial Mathematics*
- *Financial Engineering*
- *Operations Research*
- *Applied Mathematics*

Current Study

Master's Degree in Financial Engineering

University Of Pretoria (UP)

Passed Modules:

- *WTW 831 (**Mathematical and Computational Finance**): **65%***
- ****WTW 832 (Advanced Methods of Financial Engineering): **85%***
- ****WTW 833 Quantitative Risk Management **87%***

Registered Modules pending completion:

WTW 894 Dissertation Financial Engineering:

A survey of the market risk models used by the South African banking industry and their challenges with special reference to model risk

Major Subjects*:*

- ***Mathematical and Computational Finance***
- ***Advanced Methods of Financial Engineering***
- ***Quantitative Risk Management***
- ***Dissertation***

Postgraduate Diploma in Risk Management

University of South Africa (UNISA) ***2014***

Registered Modules

- *RSK4801 Operational Risk Management*
- *RSK 4803 Risk Financing*
- *RSK 4804 Credit Risk Management*
- *RSK4805 Market Risk Management*

Pending Modules

- *RSK480*

BSc Honours Degree Financial Modelling

University of South Africa (UNISA) ***2010***

Major Subjects*:*

Financial Mathematics

- ***Discrete Financial Modeling***
- ***Introduction to the Mathematical Modeling of Derivative Instruments 1***
- ***Introduction to the Mathematical Modeling of Derivative Instruments 11***
- ***Continuous Time Stochastic Processes***
- ***Stochastic Modeling 1***
- ***Applied Stochastic Modeling***
- ***Investment analysis and Portfolio management***
- ***Project I: Quantitative Management***
- ***Project II***

Position: ***Predictive Analyst (Predictive Modeling)***
Employer: *Mutual & Federal*
Period: *1 August 2015 to 30 June 2018*
Scope of Work Done:
Member of a group of professionals building predictive models for Old Mutual Insure (formerly Mutual & Federal) for application in the short-term insurance industry. Within this group I perform the following:

- *Participate in the data identification; data quality and cleaning process before deployment for predictive model building.*
- *Do the preliminary data modelling for business case writing.*
- *Do the preliminary data mining to derive information from data.*
- *Participate in target and input variable definition.*
- *Participate in model selection: so far have used the generalized linear models (GLMs) frame-work.*
- *Participate in model selection within the GLMs group of models depending on the target variable.*
- *Participate in the predictive model building process using SAS Enterprise Miner: considering the following methods:*
  - *Regression modelling (logistic regression),*
  - *Decision trees, and*
  - *Neural networks.*
- *Participate in model testing, deployment, monitoring and maintenance. Thus far the following models are at different levels of production:*
  - *Claim segmentation and Fraud detection model: currently being rolled out*
  - *PA model: deployed*
  - *Dynamic write off model: currently under production*
  - *Intelligent write off model: under production*
  - *Customer segmentation and attrition models: under consideration for future production.*
- *Current Predictive* ***Analytics Group project manager*** *and* ***chair*** *of the regular scheduled meetings.*
- *As a member of the Claims, Procurement and Claims Analytics group I do various statistical modelling for other sections of the company including:*
  - *Forecasting modelling,*
  - *Statistical quality control, and*
  - *General quantitative analysis of data using excel, SPSS, MATHLAB and SAS.*
- *Predictive Analytics reporting.*

COURSES ATTENDED: SAS programming 1 (certificate)
MINTAB – *statistical process control*
R – *data-camp online training*
: **R *Credit Risk Modeling – PDF*** *(Online Certificate)*
: **SAS** – UDEMY
: **Power BI** - UDEMY

Extra-Subjects Taken

- ***Forecasting: Software used SAS***
- ***Time Series Analysis: Software used SAS***
- ***Decision Analysis: Software used Palisade***

Project 1 Title
Statistical Process Control Concepts: A Literature Review
Project 11 Title:
Application of statistical control charts to raw Milk total bacterial cell count as a monitoring tool for the Limpopo dairy milking process
HACCP system
Courses Passed: ***See Appendix 1***

BSc Degree Mathematical Modelling, UNISA 2007
Major Subject*: Applied Mathematics and Operations research*
Courses passed: ***See Appendix 1***

Degree MSc Veterinary Science (Veterinary Ethology), *University of Pretoria, 1997*
Major Subject
*Veterinary Ethology 800 (Animal Production: Beef production): 73****%***
*Dissertation: 68****%***

Thesis Title:
Beef Production In The Rural And Commercial Sector Of The Northern Province-An Ethological Approach.

This was a holistic approach to beef cattle production comparing the production systems in the rural and commercial sector. The Animal, disease, environment, national and international politics and trade past, present and future were considered.

Degree: BVSc Honours Veterinary Science
University of Pretoria 1995
Major Subjects*:*
Veterinary infectious diseases 700: ***66%***
Veterinary clinical pathology 700: ***64%***
Veterinary Ethology 700: ***59%***

Bachelor's Degree in Veterinary Science
University of Zimbabwe (UZ) 1991
Major subject*:*
Veterinary Medicine
Veterinary Surgery
Veterinary Sciences
Animal Production
Animal Nutrition
Grassland Science

: **Python** – Data Camp and UDEMY

Achievements:

- *Awarded the Sapphire award (pushing beyond boundaries) employee of the month award for the month of June 2016 for my analysis and commentary on the impact of the Rand/US$ exchange rate on the Total Repair Costs (TRC) in the short term insurance industry that unearthed new insights in the pricing of products.*

Employment**:* ***Consultative Work
***Period**:* *January 2008 to date*
Responsibilities, Scope and Nature of work done:
Financial Modeling (Mathematics of Finance)
- *Net Present value evaluations (The Maluti Timber models)*
- *Annuities*
- *Valuation of Securities Including fixed interest Securities (Bonds)*
- *Capital Gains tax calculation*

Statistical Modeling
- *Regression analysis*
- *Time series analysis*
- *Forecasting*
- *ANOVA*

Mathematical Modeling
- *Applied Mathematics*

Operations Research
- *Optimization of resources*
- *Decision Analysis*
- *Mathematical programming*
- *Production Modeling*

Quantitative Risk Analysis
PROJECTS (Quantitative Risk Analysis)
Project I: *VaR using Variance covariance Method*
Project II: *Historical Simulation computations*
Project III: *LTCM/Monte Carlo Simulation*
Project IV: *Risk Management: Hot Spots and Hedges*
Project V: *Stress Testing and Scenario Analysis*
PROJECTS (Mathematical and Computational Finance)
Project I: *Monte Carlo methods A (a)*
Project II: *Monte Carlo methods A (b) (Control Variate methods and Antithetic Variate methods)*
Project III: *Finite Difference methods B (a) (Forward and Central Finite difference methods)*
Project IV: *Finite Difference methods B (b) (The Crank Nicolson Scheme)*
PROJECTS (Advanced Methods in Financial Engineering)
Project I: *The Binomial method*
Project II: *Option pricing using Monte Carlo (Lookback Options)*
Project III: *Volatility Forecasting*
- *The Random Walk model*
- *The Historical Average model*
- *The Moving Average model*

COMPUTER QUALIFICATIONS

- ***International Computer Driving License***
  European Computer Driving License Foundation
  Areas covered
  - *Basic concepts of IT*
  - *Using the computer and managing files*
  - *Word Processing*
  - *Spreadsheets*
  - *Database*
  - *Presentation*
  - *Information and Communication*

COMPUTER SOFTWARE SKILLS

- *MS Word*
- *MS Excel*
- *MS Publisher*
- *PowerPoint*
- *Internet*

INDUSTRY SPECIFIC COMPUTER SKILLS

- *R*
- *Python*
- *SQL*
- *SAS*
- *Power BI (learning)*
- *SPSS*
- *Lingo*
- *Lindo*
- *Minitab*
- *Mathlab*
- *Mathematica*
- *C++, Pascal*

SHORT COURSES

- *Certificate course in African Epizootic Diseases (Department of Veterinary Tropical Diseases, Faculty of Veterinary Science, University of Pretoria, 1996)*
- *Certificate in computer literacy (UniSchool-Pretoria, University of Pretoria, 1997)*
- *Diploma in computer literacy (UniSchool-Pretoria, University of Pretoria, 1997)*
- *Certificate of Attendance **STA203-N Practical Course** using the statistical package SPSS (Department of Statics, University of South Africa)*

PROFESSIONAL BODIES REGISTRATION

- ***ORSSA*** – Operations Research Society of South Africa
- ***ASSA*** – Actuarial Society of South Africa

- *The Exponential Smoothing model*
- *The Exponentially Weighted Moving Average model*
- *The GARCH (1, 1) model*
- *Applications to **Market risk**, Credit risk, Operational risk*

Advanced Methods in Financial Engineering

- *Pricing of options:*
    - *the Binomial model,*
    - *the Black Scholes Merton Equation*
- *Pricing of real options*
- *Hedging*

Position: ***External examiner (Periodic)***
***Period**:* *January 2001 to July 2015*
***Employers**:* *Universities of Limpopo and Pretoria in the Faculties of Animal production and Veterinary Sciences respectively (undergraduate, Honours and Masters Students)*

Responsibilities:

- *Script Moderation*
- *Dissertation Moderation*
- *Oral Examination*

Position: ***Module writing and Curriculum development (Contractual)***
Period: *March 2009 to July 2015*
Employer: *UNISA*
Responsibilities:
Wrote the following Modules:
ANIMAL DISEASES (Animal Health national diploma)

- *UNIT 7: PIG PRODUCTION*
- *UNIT 8: POULTRY PRODUCTION*
- *UNIT 9: SMALL RUMINANT PRODUCTION*
- *UNIT 10: WILDLIFE AND HORSES*

AGRICULTURE ANIMAL SCIENCE (BSc (Animal Science))

- *ADVANCED ANIMAL PHYSIOLOGY: REPRODUCTIVE PHYSIOLOGY*
- *RUMINANT PRODUCTION*
- *MONOGASTRIC PRODUCTION*

CURRICULUM DEVELOPMENT (Animal Health national diploma)

- *VETERINARY DISASTER MANAGEMENT*

Position**:* ***Anatomy and Physiology Tutor
(Animal Health National Diploma Students – Part Time position)
***Period**:* *March 2008 to date*
***Employer**:* *UNISA*
***Responsibilities**:*

- *Tutoring*
- *Lecturing*
- *Mentoring*

Position: ***Middle Manager***
Period*:* *June 1999 to 30 July 2015*
Employer*:* *Limpopo Department of Agriculture*
As below (Areas: Akganang, Blouberg and part of Molemole municipalities)
Experience*:* *As below*

Position*:* ***Chief State Veterinarian***
Period: *June 1996 to June 1999*
Employer*:* *Limpopo department of Agriculture*
Responsibilities*:* *As below (Areas: Akganang, Blouberg and Molemole municipalities)*
Experience*:* *As below*

Position: ***Senior State Veterinarian***
Period: ***May 1994 to May 1996***
Employer: *Northern Province department of Agriculture*
Responsibilities*:* *As below (Area: Seshego state vet area)*
Experience*:* *As below*

Position: ***State Veterinarian***
Period*:* *June 1993 to April 1994*
Employer*:* *Government of the Homeland of Lebowa*
Responsibilities:

- *Management of 120 Veterinary technicians;*
  (In Seshego, Mokerong, Bochum, Phalala and Mankweng)
- *Drawing of the Veterinary budget;*
- *Veterinary clinical work (all domestic animals);*
- *Veterinary surgical work (all domestic animals)*
- *Management of Animal Health programmes and schemes;*
- *Management of Veterinary public Health programmes and schemes;*
- *Manage Veterinary projects as required by Pretoria;*
- *Manage government animal production farms:*

(Managed Projects: Stellenbosch Nguni breeding station, Brague Bonsmara breeding station, Vaalpenskraal Bonsmara, Afrikander and Boer goats breeding station, Kalkbank Afrikander and Boer goat breeding station, Pecks poultry project, Bahananoa Afrikander breeding station, Devonia beef breeding project, Moletjie Dairy, Sipitse Dairy, Amamos beef breeding project, Mashashane Hatchery and Phalala beef breeding project)

- *District monthly report compilation and submission;*
- *Veterinary Research;*
- *Training of Veterinary students from Medunsa;*
- *Training of Veterinary technical staff;*
- *Rural Veterinary Extension;*
- *Management of Rural development and poverty alleviation projects*

EXPERIENCE*:*

- *Budgeting*
- *Project management*
- *Research*
- *Personnel, student and lay training and education*
- *Cross cultural Personnel management*
- *Conflict management*
- *Herd Health Management (beef, dairy, goats and poultry)*

REFERENCES

1. *Dr J Chamunorwa*
   Associate Professor of veterinary Physiology
   University of Pretoria
   Faculty of Veterinary Sciences, R.S.A
   Cell: 0728109937
   joseph.chamunorwa@up.ac.za
2. *Mr. Thabi Segoale*
   082 561 5654
3. *Dr. T.W Malatse*
   082 881 7315
   drmalatse@agric.limpopo.gov.za
4. *Dr. O. Rikhotso*
   082 8817138

OUTSIDE OF MUTUAL & FEDERAL: Member of the Academic Advisory group of the department of Agriculture of UNISA.

APPENDICES

*Appendix 1: BSc (**Honours Financial Modeling**)*
Courses Passed: February 2009

- *HONPR1B (Quantitative Management: SAS) (Project 1),*
- *HONSM1A (Stochastic modeling 1),*
- *HONMD1Y (Introduction to the mathematical modeling of derivative instruments 1).*

Courses Passed: February 2010

- ***HONPR2B (Project 2: SAS),***
- ***HONCS1Y (Discrete financial modeling),***
- *HONMD23 (Introduction to the mathematical modeling of derivative instruments 11),*
- *HONFIN6 (Financial mathematics),*
- *HONASMB (Applied stochastic modeling),*
- *HONINV4 (Investment analysis and Portfolio management),*
- *APM4024 (Continuous time stochastic processes),*
- ***STA3704 (Time series analysis: Software used SAS)(NDP),***
- ***HONDANE (Decision analysis)(NDP),***
- *HONFORP (Forecasting: Software used SAS)(NDP).*

-Course Passed with Distinction.

*Appendix 2: BSc (**Mathematical Modeling**)*
Courses Passed: Year 2002

- ***APM114V (Mathematical modeling: Applied mathematics 114),***
- ***MAT103N (Linear algebra: Mathematics 103),***
- ***MAT111N (Precalculus mathematics B: Mathematics 111),***
- ***MAT112P (Calculus A: Mathematics 112),***
- *MAT113Q (Calculus B: Mathematics 113),*
- ***OPS101G (Introduction to the Business world),***
- *OPS102H (Modeling in a Financial environment),*
- *STA101H (Probability theory: Statistics 101),*
- ***STA111K (Distribution theory 1: Statistics 111).***

Courses Passed: Year 2003

- *APM113U (Applied linear algebra: Applied mathematics 113),*
- *APM211V (Differential equations: Applied mathematics 211),*
- ***CSS101H (Comprehension skills for science: Comprehension skills for science 101),***
- *MAT211R (Linear algebra: Mathematics211),*

- *MAT212S (Introduction to Discrete mathematics: Mathematics 212),*
- *OPS2O1K (Mathematical programming: Software used LINDO and LINGO),*
- ***OPS202L (Rational Decision making),*
- ***OPS205P (Financial Modeling),*
- *STA202 (Distribution theory 2: Statistics 202).*

Courses Passed: Year 2005

- *COS111U (Introduction to programming 1: Computer science 111-Programming languages: C++, Pascal),*
- *MAT306X (Ordinary differential equations: Mathematics 306),*
- *MAT307Y (Discrete mathematics: Combinatorics - Mathematics 307),*
- *OPS302P (Optimization of resources: software used-LINGO and LINDO),*
- *OPS304R (Models for strategic decision-making),*
- *APM301W (Partial differential equations: Applied mathematics 301),*
- *OPS301N (Production modeling),*
- *OPS306T (Selected topics in Operations Research) (NDP),*
- *STA303R (Inference: Statistics 303) (NDP).*

Courses Passed: Year 2006

- *APM213X (Numerical methods 1: Applied mathematics 213-Programming languages used: C++, Pascal, Mathlab),*
- *ECS1016 (Economics 1A: Economics 101-Micro-Economics) (NDP),*
- *STA203N (Applied statistics: Statistics 203-Software used: SPSS) (NDP).*

Courses Passed: Year 20007

- *APM311Y (Numerical methods 2: Applied mathematics 311),*
- *OPS303Q (Simulation),*
- ***OPS305S (Financial Risk Modeling),*
- *STA302Q (Distribution theory 3: Statistics 302) (NDP),*
- ***ECS1028 (Economics 1B: Economics 102-Macro-Economics)(NDP),*
- *ECS209J (The South African Financial System: Economics 209).*

Courses Passed: Year 2007

- *CEM101A (End user computing: Exempted after obtaining the ICDL certificate).*

**-Courses Passed with Distinction*