

NewSouth Innovations & MASCOs

# **The What, Why and How of protecting your research**

**Thursday 1<sup>st</sup> Sept, 2005**

Commercialising Research  
at UNSW

**Mr Andrew Stead**  
**NewSouth Innovations**

# Introduction

- Agenda
  - Team Overview
  - NSi Overview
  - Commercialisation Process

# NSi Objective No.1

- Interface with University researchers and commercialisation partners to ensure that any research with potential commercial application is captured, registered, assessed, protected and commercialised appropriately.

# NSi Overview

- Build relationships with:
  - Researchers
  - Commercialisers
  - Investors
- Streamline internal processes
- Improve the technology transfer output of UNSW.

# Why Commercialise?

- Seek fame and fortune
- Create opportunities for yourselves, the School and the University.
- Social good

# Commercialisation Process

- Identification
- Assessment
- Protection
- Commercialisation
  - Strategy
  - Marketing
  - Negotiation

# Outcomes

- Start with the end in mind
- Options:
  - Collaboration
  - Licensing
  - Sale
  - Spin-off



# NSi & Researcher Collaboration

## Identification -

- NSi:
  - Assist and advice
- Researcher:
  - Identify technologies with commercial potential
  - Initial due diligence (IP & literature)
  - Disclosure (e.g. publishing)
  - Student involvement
  - Grant conditions

# NSi & Researcher Collaboration

## Assessment -

- NSi:
  - Initial due diligence
  - Assess market potential
  - Determine protection options
- Researcher:
  - Educate us in your field of study
  - Collaborate in the NSi tasks
  - Continue to develop technology
  - Maintain secrecy

# NSi & Researcher Collaboration

## Protection -

- NSi:
  - Engage patent attorneys
  - Manage the process over the life of the patent
- Researcher:
  - Assist in drafting the patent

Provisional	PCT	National	Maintain
6wks	12mths	30mths	20yrs
\$3.5k	\$10k	\$50k-100k	\$10k-20k/yr

# NSi & Researcher Collaboration

## Commercialisation -

- NSi:
  - Strategy
  - Marketing
  - Negotiation
- Researcher:
  - Collaborate in the NSi tasks
  - Continue to develop technology
  - Actively seek marketing opportunities

# Summary

- NSi is an enhanced entity that aims to improve engagement with researchers.
- NSi is prepared to be a key contributor to your research efforts.
- NSi is here to assist you and offer advice on IP and commercialisation.

IP Protection & Mathematics

**Mr Tim Staley**

**Griffith Hack Patent & Trade Mark Attorneys**

**You Cannot Patent Algorithms  
or  
Mathematical Methods**

**TRUE**

1. Overview of IP Protection Available
2. Patents for Mathematics Related Inventions
3. Patent Process. Variations Between Jurisdictions
4. Trends in Mathematics/Algorithm Related Patents



# Legal Protection

- Patents (Inventions/Technology)
- Designs (Visual Appearance)
- Trade Marks (Brand Protection)
- Confidential Information
- Trade Secrets
- Copyright
- Passing Off

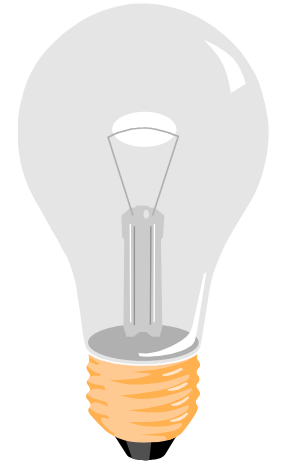
# Patents

- Powerful monopoly protection
- Methods/processes
- Computer programmes
- Devices
- Pharmaceuticals
- Genetics
- Business processes
- Mechanical

Essentially all technology

# Claim

- An illumination device comprising
- a conductive medium;
  - means for applying electricity (terminals);
  - when electricity is applied the conductive medium gives off light.



- Different Types of IP Protection Available
- Patents are the Most Powerful and Appropriate for Technology Inventions

# Patentability

- Subject Matter
- Newness
- Inventiveness



# Patentability

## s.6 Statute of Monopolies. 1628

“Provided also (and be it declared and enacted) (*q*) that any declaration before mentioned shall not extend to any letters patent and grants of privilege for the term of fourteen (*r*) years or under, hereafter to be made, of the sole working or making of any manner of new manufacture within this realm, to the true and first inventor and inventors of such manufactures (*s*), which others at the time of making such letters patent and grants shall not use, so as also they be not contrary to the law nor mischievous to the State, by raising prices of commodities at home, or hurt of trade, or generally inconvenient.”

# Patentability

## Categories of Subject Matter

1. Physical processes and products embodying a novel and inventive idea that are capable of being monopolised (because they are tangible) e.g. mouse traps, pharmaceuticals, computer hardware.
2. Things that are inherently incapable of monopolisation e.g. scientific discoveries, purely mental processes (mathematical methods).
3. Things capable of monopolisation but which are excluded on policy grounds.

# Patentability

## NRDC

“A mode or manner of achieving an end result which is an artificially created state of affairs of utility in the field of economic endeavour”.



# Patentability

## **SLEE & HARRIS 1962 (U.K.)**

A computer program embodied by punched cards is patentable.

Monopoly to “linear programming means”.

# Patentability

## IBM 1992 (AU)

A programme for plotting an improved curve on a computer display. Using a known algorithm.

# Patents for Maths

## The Claim (IBM)

1. A method for producing a visual representation of a curve image from a set of control points which define the curve and which are input for each dimension and a number of intervals of the curve to be completed, said method comprising the steps of:

(a) computing a set of scaled vector coefficient integers for each dimension from the set of input control points for that dimension and from a scaling parameter;

(b) computing forward difference interval coefficient integers for each dimension for each interval from the scaled vector coefficient integers for that dimension and the interval integer number;

(c) computing the curve coordinate values for each interval for each dimension from the forward difference interval coefficient integers for that dimension for each interval and the scaling parameter; said computing steps being carried out without the use of floating point arithmetic; and

(d) displaying the curve by displaying curve coordinate points in accordance with the computed curve coordinate values for each dimension and a plurality of straight lines which successively connect said computed curve coordinate points.

# **Patentability**

**State Street Bank 1998 (U.S.)**

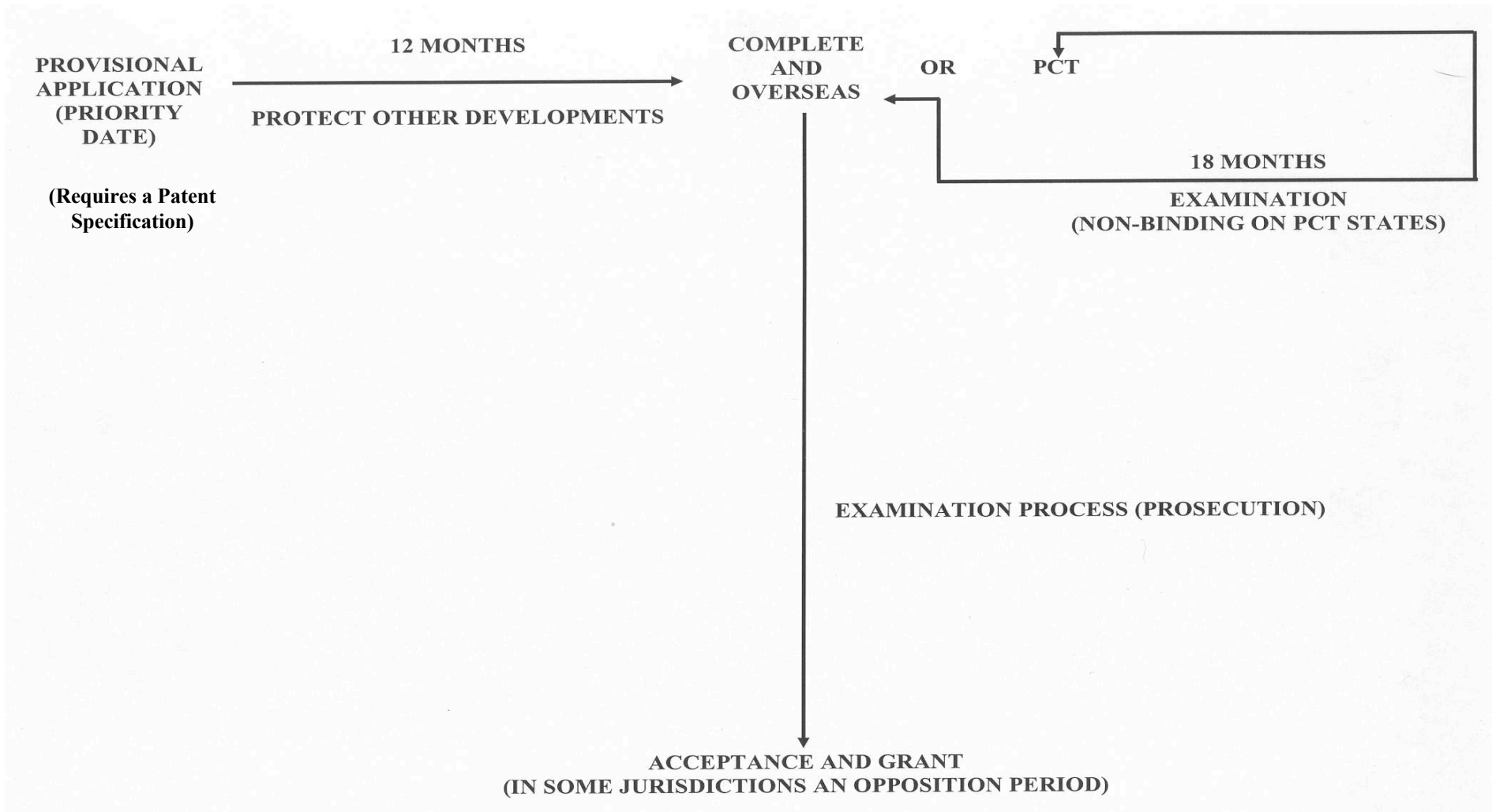
**“Hub and Spoke” Financial Services  
Data Processing System**

**“Useful, concrete and tangible result”**

# Patents for Maths

It is the application of the algorithm that is patented, not the algorithm itself. The algorithm is a discovery. The application is a “*manner of manufacture*”.

# Process



# Publication

## Publication

- NO publication before lodging application.

## Publication May be By Way Of:

- Aural
- Written
- Any non-confidential disclosure.

# Use

- NO commercial use before lodging

## **Commercial Use Will Be:**

- Accepting payment for an order.
- “Secretly” using for commercial benefit (e.g. secret recipe).



# Grace Period

AUSTRALIA

US

CANADA

NOT EUROPE

## **In Australia:**

- Secret use does not benefit from the grace period.
- Other persons publications will still affect potential patent protection.

# Patentability

- EUROPE – “Technical Implementation” required.
- U.S. or JP – Not technological implementation required.
- Australia – “Science or Technology” required.

# Exploitation of Mathematical Developments

- Bioinformatics
- Encryption (RSA)
- Computing
- Finance (Business Methods)
- Robotics
- Image Processing

# Exploitation of Mathematical Developments

## TRENDS

- More patent filings
- More subject matter is patentable

**MATHEMATICAL  
APPLICATIONS ARE  
PATENTABLE**

# Patenting Business Methods

**Dr Peter Cotton**  
**Morgan Stanley Bank - USA**

# Outline

A Case Study

Patents and Mathematics?

# **A Case Study**

The business

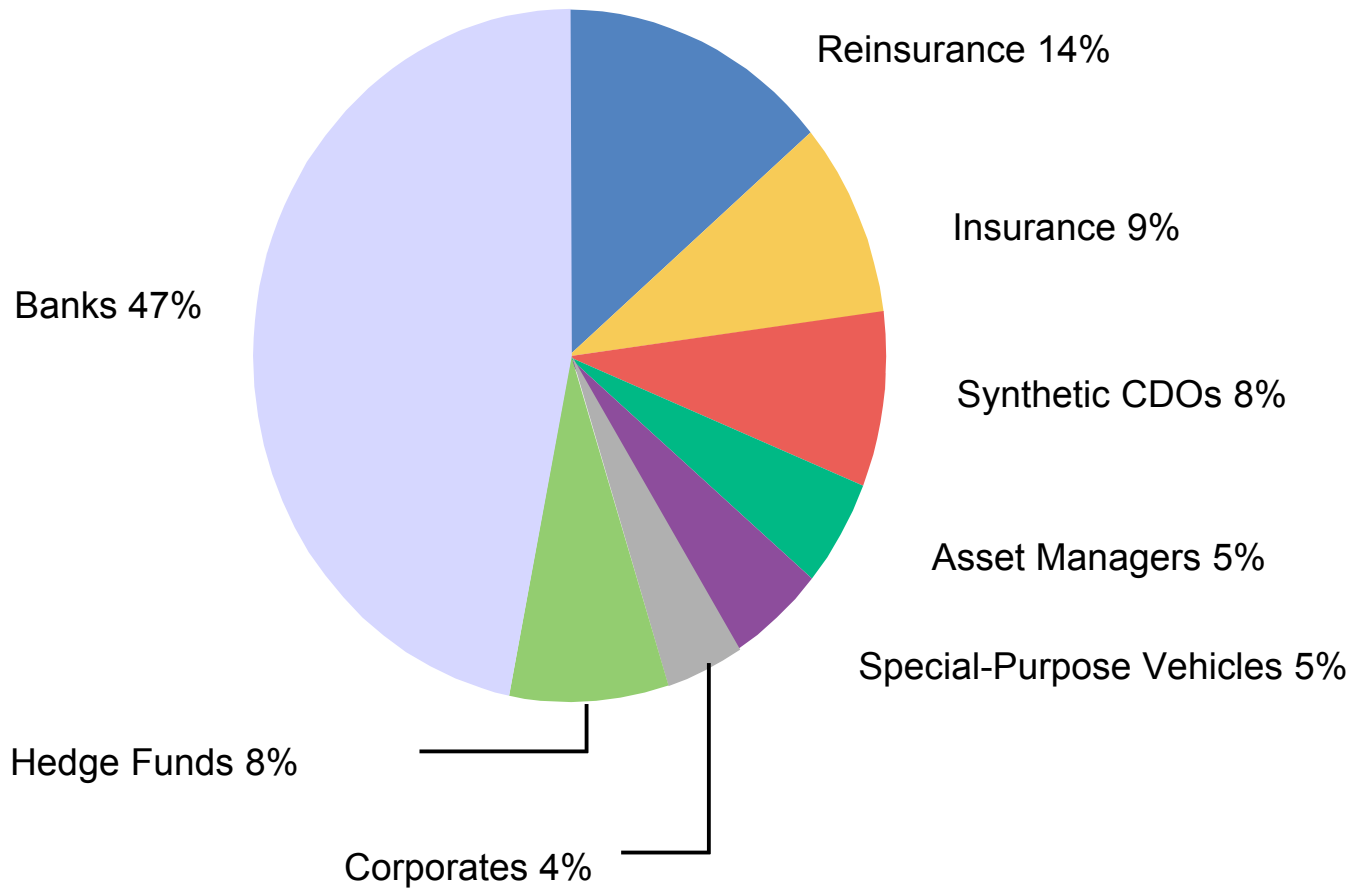
The invention

The process

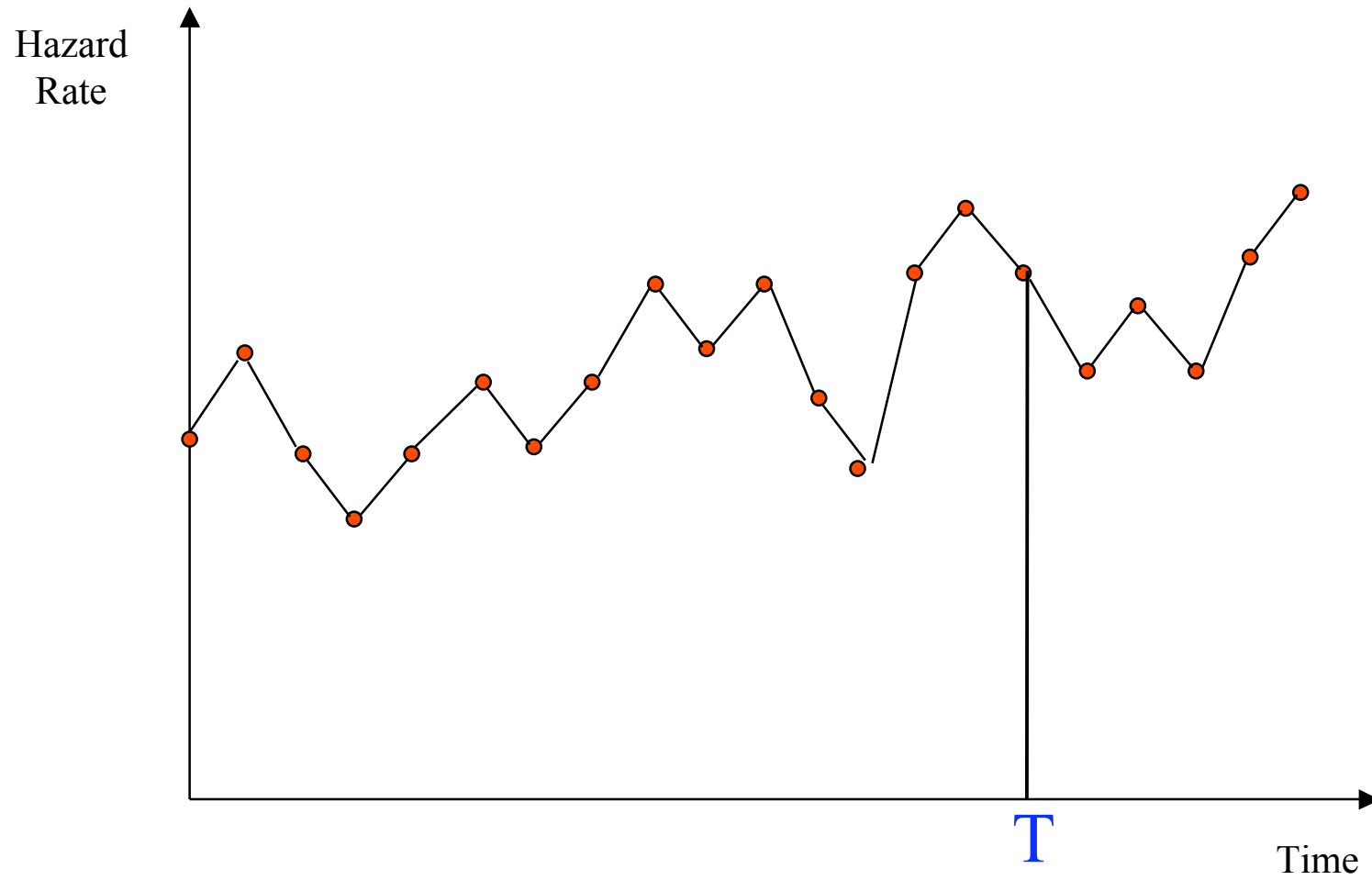
The patent



# The Business



# An Algorithm



# The Process

Iterations with lawyers

No provisional

Locating the inventors (!)

Signing away rights

# The Patent

APPLICATION FOR UNITED STATES LETTERS PATENT

**TITLE: SYSTEM AND METHOD FOR PRICING DEFAULT INSURANCE**

**APPLICANT:**

Shinghoi Lee

Peter Cotton

Zhifeng Zhang

Kin Pang

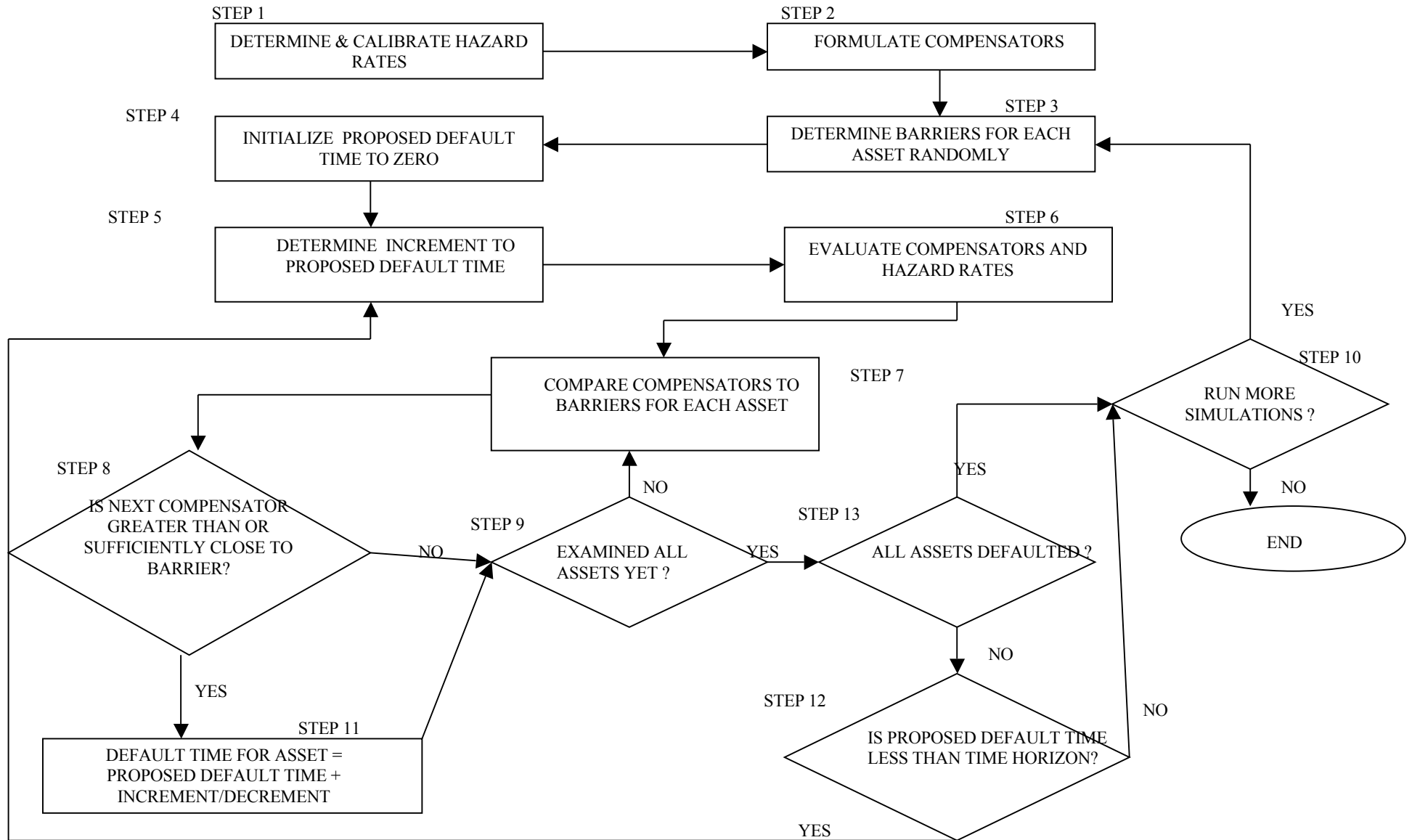
# Independent Claims

1. A method for calculating a default time for at least one of a plurality of securities contained in a basket of securities, the method comprising the steps of:
  - identifying a plurality of hazard rates, each of said plurality of hazard rates corresponding to one of said plurality of securities;
  - formulating a plurality of compensators, each of said plurality of compensators based on one of said plurality of hazard rates corresponding to each of said plurality of securities;
  - selecting a plurality of barriers, each of said plurality of barriers corresponding to one of said plurality of securities;
  - determining a proposed default time for said at least one of said plurality of securities;
  - calculating a value of said compensator and said barrier corresponding to said at least one of said plurality of securities based on said proposed default time; and
  - determining that said proposed default time is said default time for said at least one of said plurality of securities.

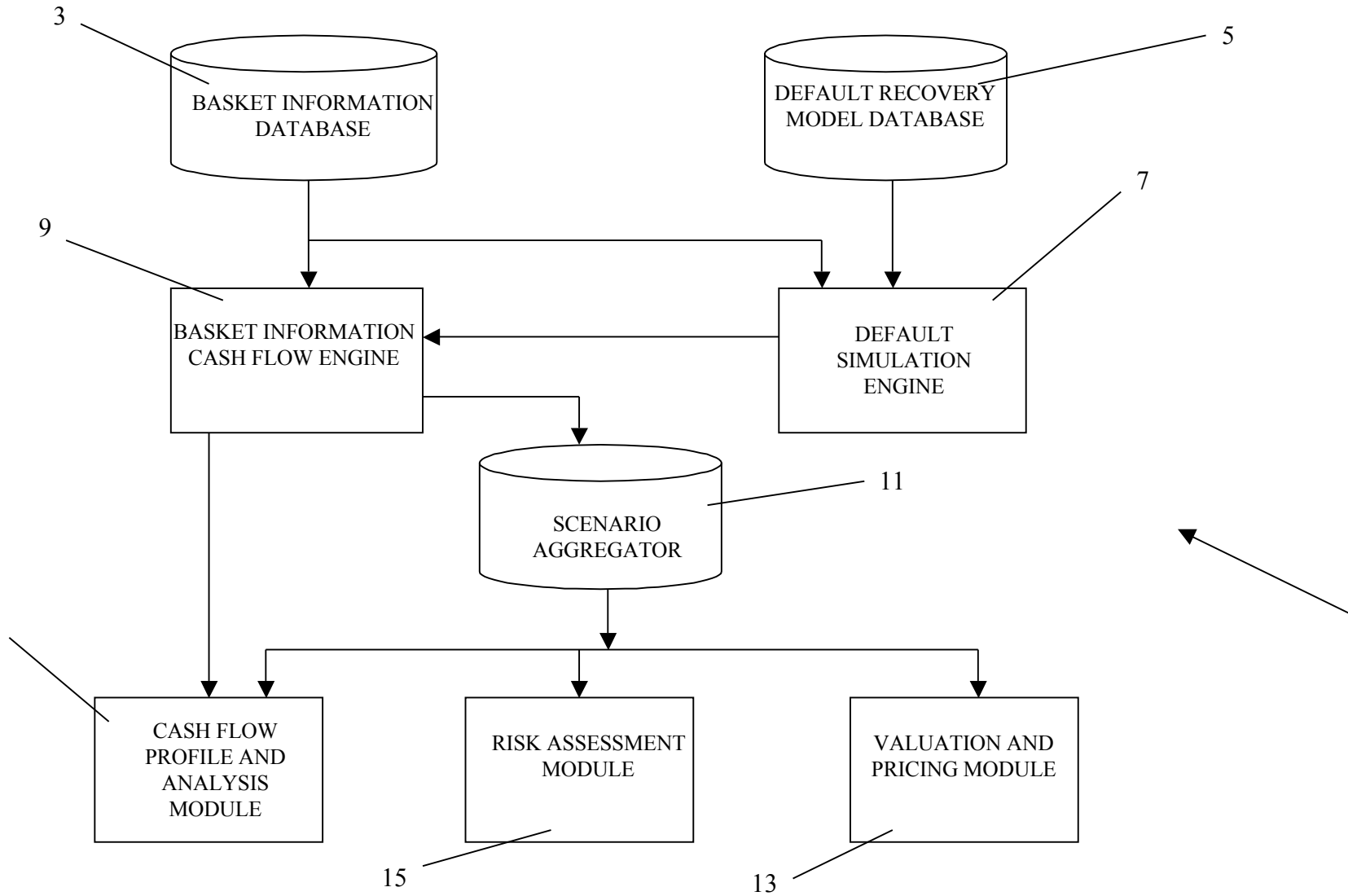
# Dependent Claims

2. The method of claim 1, wherein the step of determining a proposed default time includes the steps of:
  - calculating values of said plurality of hazard rates and said plurality of barriers calculated at time zero;
  - forming a plurality of ratios wherein each of said plurality of ratios equals one of said plurality of barriers calculated at time zero divided by a corresponding one of said plurality of hazard rates calculated at time zero; and
  - selecting a smallest one of said plurality of ratios as said proposed default time.

# Flow Diagram



# Figure





# Summary of the Invention

The present invention is directed to overcoming the drawbacks of the prior art.

Under the present invention a method for calculating a default time for at least one of a plurality of securities contained in a basket of securities is provided and includes the step of identifying a plurality of hazard rates wherein one of the plurality of hazard rates corresponds to each of the plurality of securities.

Next, a plurality of compensators is formulated wherein each of the plurality of compensators is based on said one of the plurality of hazard rates corresponding to each of the plurality of securities. The method also includes the steps of:

- (a) selecting a plurality of barriers, one of the plurality of barriers corresponding to each of the plurality of securities;
- (b) determining a proposed default time for the at least one of the plurality of securities...etc.

# Lessons

Cost is high

Too many iterations

# Reasons to Patent

Defensive

Authorship

Generality

Throwing a dummy

“Nicer” than non-compete agreements

Marketing

# Reasons Not to Patent

Trade secrets

Time & energy

Disclosure & enforcement

Iterations

Time taken to gain familiarity with patent jargon & structure

Extraneous fluff - inefficient means of communication –  
downright dumb

# Common Attitudes Towards Patenting in Finance

Largely untested

Largely defensive

Largely ignored

Against the grain

Better ways to make money

Conflict of interest with individual

Very slow to take up (also the insurance industry)

**Nobody likes using other people's ideas anyway!**

# The Great Patent Rush?

State Street versus Signature Financial:

The Federal Circuit also held that the transformation of discrete dollar amounts through a series of mathematical calculations by a computer, into a final share price, constituted a practical application of a mathematical algorithm, formula or calculation.

Between 1996 and 2000, business-method patent filings quadruple.

# Lessons from Bad Experiences with Patenting

Do it yourself as much as possible (but use a lawyer)

Decide very early on if it is worth the time to get your attorney up to speed

Learn the claim structure

Don't underestimate time and cost

# What to Patent

Simple

Non-obvious

Hard to circumvent

Central



# Can Patents Fund Mathematics?

**Is this evil?**

There are already enough incentives not to use other people's ideas

**In private research?**

**In public research?**

# We Claim:

1. A method for encoding and decoding a digital message  $m$ , comprising the steps of:

- selecting ideals  $p$  and  $q$  of a ring  $R$ ;
- generating elements  $f$  and  $g$  of the ring  $R$ , and generating element  $Fq$  which is an inverse of  $f \pmod{q}$ , and generating element  $Fp$  which is an inverse of  $f \pmod{p}$ ;
- producing a public key that includes  $h$ , where  $h$  is congruent, mod  $q$ , to a product that can be derived using  $g$  and  $Fq$ ;
- producing a private key from which  $f$  and  $Fp$  can be derived;
- producing an encoded message  $e$  by encoding the message  $m$  using the public key and a random element  $.o$  slashed.; and
- producing a decoded message by decoding the encoded message  $e$  using the private key.

# Is There a Middle Ground?

Are universities set up for monetizing patents?

Are companies set up for monetizing patents?

A role for non-profits?

Example:

*Institute for One World Health*

# Panel Discussion

**Mr Andrew Stead**

**Mr Tim Staley**

**Dr Peter Cotton**