# PROGRAM LISTING

relative agent skill=
     skill per agent/ standard agent skill
     ~     1
     ~         |

Net Products In Force= INTEG (
     net product sales  - products maturing, initial products)
     ~     products
     ~         |

average product life=
     Net Products In Force / (products maturing)
     ~     year
     ~         |

Profitability=
     net product sales / total compensation * 100*case size
     ~
     ~         |

net product sales=
     product sales * (1-lapse rate)
     ~     products/year
     ~         |

product sales=
     sales productivity * Agents
     ~
     ~         |

lapse rate=
     effect of skill per agent on lapse rate * effect of agent quits on lapse rate*adjuster
     ~     1
     ~         |

Agents' Sales Skill= INTEG (
     added skill at hire - lost skill from agent quits - lost skill from promotion + agent
learning, Agents*agent initial average skill level)
     ~     equiv years
     ~     Agent Sales Skill is an intangible resource that determines how effective each
sales agent is at finding and converting sales prospects into closed deals
     |

hires=
     target number of recruits
     ~     agents/year
     ~     The rate at which agents are taken into the firm - measured now in agents per
year.
     |

agents promoted=
     0.024*Agents
     ~     agents/year
     ~         |

expected agent compensation=
     20000
     ~     $/(year*agents)

```
        ~              |
sales productivity=
        standard sales productivity *relative agent skill
        ~       products/(year*agents)
        ~              |
target number of recruits=
        ( agent quits + agents promoted)
        ~       agents/year
        ~              |
total compensation=
        total agent compensation
        ~       $/year
        ~              |
effect of skill per agent on lapse rate=
        rel agent skill lookup(relative agent skill)
        ~       Fraction
        ~              |
adjuster=
        2.5
        ~
        ~              |
rel agent skill lookup(
        [(0,0)-(5,1)],(0,1),(1,0.6667),(2,0.45),(3,0.25),(4,0.15),(5,0.1))
        ~
        ~              |
agent skill at hire=
        standard agent skill at hire * effect of recent relative compensation on recruited skill
        ~       equiv years/agents
        ~              |
added skill at hire=
        hires * agent skill at hire
        ~       equiv years/year
        ~              |
effect of recent relative compensation on recruited skill=
        effect of rel comp on recruit skill lookup(recent relative compensation)
        ~       Dimensionless
        ~              |
effect of rel comp on recruit skill lookup(
        [(0,0)-(8,12)],(0,0),(0.11,0.03),(0.22,0.07),(0.31,0.17),(0.58,0.5),(1,1),(1.1,1.21)\
                ,(1.5,1.8),(2.5,3.25),(5,7),(8,12))
        ~       Dimensionless
        ~              |
standard agent skill at hire=
        3
        ~       equiv years/agents
        ~              |
PI init= INITIAL(
        Profitability)
        ~
        ~              |
```

Tot Comp init= INITIAL(
    total compensation)
    ~
    ~       |
total agent compensation=
    Agents * compensation per agent
    ~    $/year
    ~       |
Profit Index 1=
    net product sales / total compensation * 100
    ~    (products*year)/$
    ~       |
initial average product life=
    6
    ~    year
    ~       |
initial products=
    initial average product life * net product sales
    ~    products
    ~       |
unitless agent quit rate=
    agent quit rate / max agent quit rate
    ~    Fraction
    ~       |
max agent quit rate=
    1
    ~    1/year
    ~       |
effect of agent quits on lapse rate=
    unitless agent quit rate * proportion of agent quit policies lapsing * impact of agent
relationships on lapse rate
    ~    Dimensionless
    ~    ( 1 * ( 1 - unitless agent quit rate) + unitless agent quit rate * \
        proportion of agent quit policies lapsing * impact of agent relationships \
        on lapse rate ) - Maurice's formulation - only 1st part OK
    |
recent relative compensation=
    DELAY1I(relative compensation, time to react to compensation , 1)
    ~    1
    ~       |
time to react to compensation=
    0.25
    ~    year
    ~       |
relative skills of promoted agents=
    1.8332
    ~    1
    ~       |
effect of relative comp on agent quits=
    effect of relative comp on agent quits lookup(recent relative compensation)

```
        ~       1
        ~               |
effect of relative comp on agent quits lookup(
        [(0,0)-(4,2)],(0,2),(0.5,1.5),(1,1),(2,0.5),(3,0.25),(4,0.1))
        ~       1
        ~               |
compensation per agent=
        variable agent compensation +agent fixed compensation
        ~       $/(year*agents)
        ~               |
agent quit rate=
        standard agent quit rate *effect of relative comp on agent quits
        ~       1/year
        ~               |
lost skill from promotion=
        agents promoted * skill per agent *relative skills of promoted agents
        ~       equiv years/year
        ~               |
variable agent compensation=
        agent commission rate * case size *  sales productivity * (1 - lapse rate )
        ~       $/(year*agents)
        ~       The average yearly compensation of the agent is a key variable in \
                determining the rate at which agents quit the firm.
        |
relative compensation=
        compensation per agent / expected agent compensation
        ~       Fraction
        ~               |
relative skill of quits=
        0.9
        ~       Fraction
        ~               |
lost skill from agent quits=
        agent quits * skill per agent * relative skill of quits
        ~       equiv years/year
        ~               |
impact of agent relationships on lapse rate=
        1
        ~       Fraction
        ~               |
agent commission rate=
        1
        ~       Dimensionless
        ~               |
agent quits=
        Agents * agent quit rate
        ~       agents/year
        ~       The rate at which agents leave the firm is measured in agents / year and \
                is very important for it to be at a low rate to maintain the skill level \
                of the firm.
```

```
         |
case size=
      160
      ~        $/products
      ~                    |
standard sales productivity=
      125
      ~        products/(year*agents)
      ~                    |
proportion of agent quit policies lapsing=
      0.75
      ~        Fraction
      ~                    |
standard agent skill=
      3
      ~        equiv years/agents
      ~                    |
standard agent quit rate=
      0.2
      ~        1/year
      ~                    |
products maturing=
      Net Products In Force / time to maturity
      ~        products/year
      ~                    |
time to maturity=
      20
      ~        year
      ~                    |
manager person convertor=
      1
      ~        managers / person
      ~                    |
Agents= INTEG (
      hires - agent quits - agents promoted,
             100)
      ~        agents
      ~        Agents are a critical resource because they are the direct generator of
revenues. The agent job invovles visiting clients with the hope that they will persuade the \
             client to purchase a financial service product.  A typical branch would \
             have 1 branch manager with 5-10 sales managers working for him/her.  Each \
             sales manager would be responsible for 6 - 12 agents.
             Only potential sustainable advantage from complementarity involving \
             skills, learning ablitility, company reputation, manager time
      |
agent initial average skill level=
      3
      ~        equiv years/agents
      ~                    |
agent fixed compensation=
```

5000
~       $/(year*agents)
~       Fixed component of compensation e.g. salary
|

skill per agent=
    Agents' Sales Skill / Agents
~       equiv years/agents
~       The skill per agent is derived by dividing the total amount of experience \
          by the number of agents to get units of equiv_years per agents.
|

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    .Control
\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*~
        Simulation Control Paramaters
|

FINAL TIME  = 20
~       year
~       The final time for the simulation.
|

INITIAL TIME  = 0
~       year
~       The initial time for the simulation.
|

SAVEPER  = 0.125
~       year
~       The frequency with which output is stored.
|

TIME STEP  = 0.03125
~       year
~       The time step for the simulation.
|