Insurance Claim Operations

Towards Optimal Resourcing Strategy

Submission to 2021 International System Dynamic Conference

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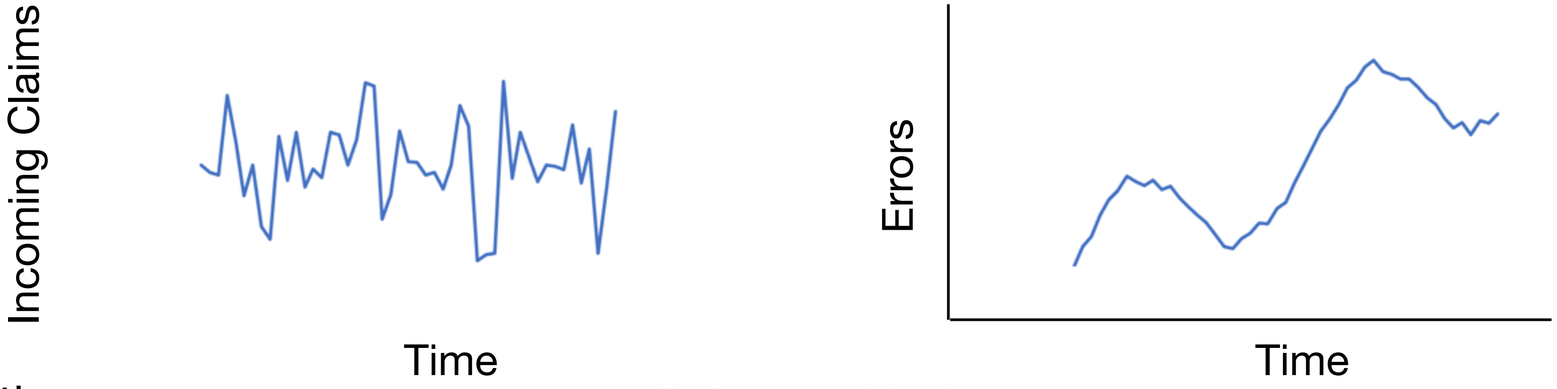
Problem & Study Objective

- Problem

  An Insurer's claim organization is faced with fluctuating incoming claims. Yet, it needs to process claims timely and fairly. This presents a challenge to keep service quality and resources at an optimal level.

  New graduate hires is part of resource solution for this case study where such hires are to provide low cost resources, yet overhead (i.e. training) required is seen to offset the lower cost. Management is uncertain the cost benefit of this solution.



Reference Mode

- Study Objective

  The objective of this study is to evaluate the cost implication of the new graduate hires as opposed to an alternative to hire resources from the market.

Dynamic Hypothesis - Insurance Claim Operation

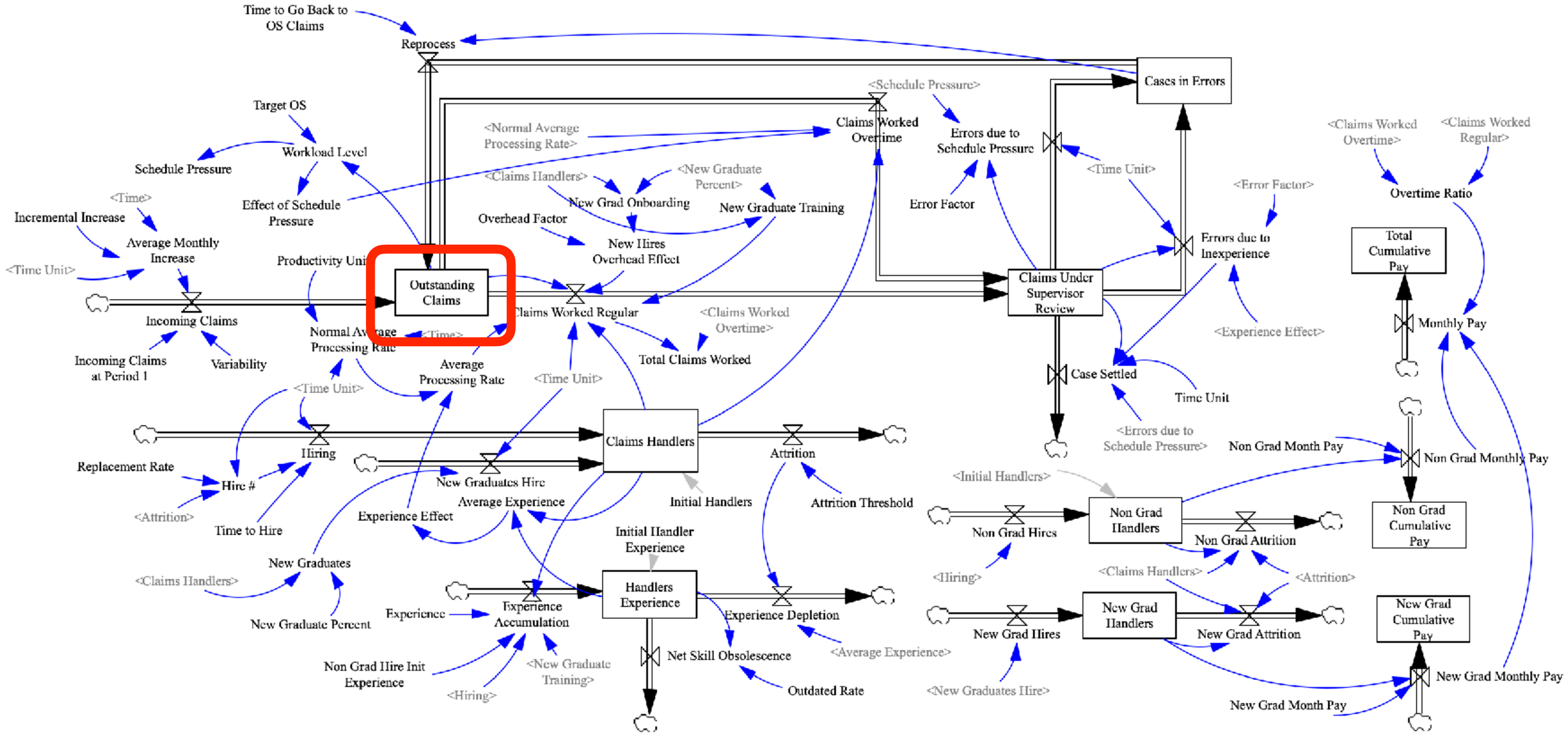
Balance between the‘Outstanding Claims’ and‘Claim Handlers’ determine ‘Workload per Handler.’

Greater the ‘Workload per Handler’ becomes, it prompts ‘New Hires’, but also ‘Leavers’. Smaller it becomes, it prompts ‘Terminations (i.e. Layoffs).

‘New Hires’, ‘Leavers’, and ‘Termination’ dilute or erode ‘Skills & Experiences’ as a whole. This can make the operation error-prone. This, in turn, creates rework and increases ‘Outstanding Claims.’

Erosion of ‘Skills & Experiences’ can be compensated by ‘Training’ and ‘Handlers’ Tenure’. But, changes in technology, new products, and changes in work environment can worsen the erosion.

Model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Cases in Errors
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Workload Level
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Errors due to Schedule Pressure
Error Factor
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Overhead Factor
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Experience
Experience Accumulation
Experience Depletion
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New Grad Attrition
New Grad Cumulative Pay
Non Grad Hire Init Experience
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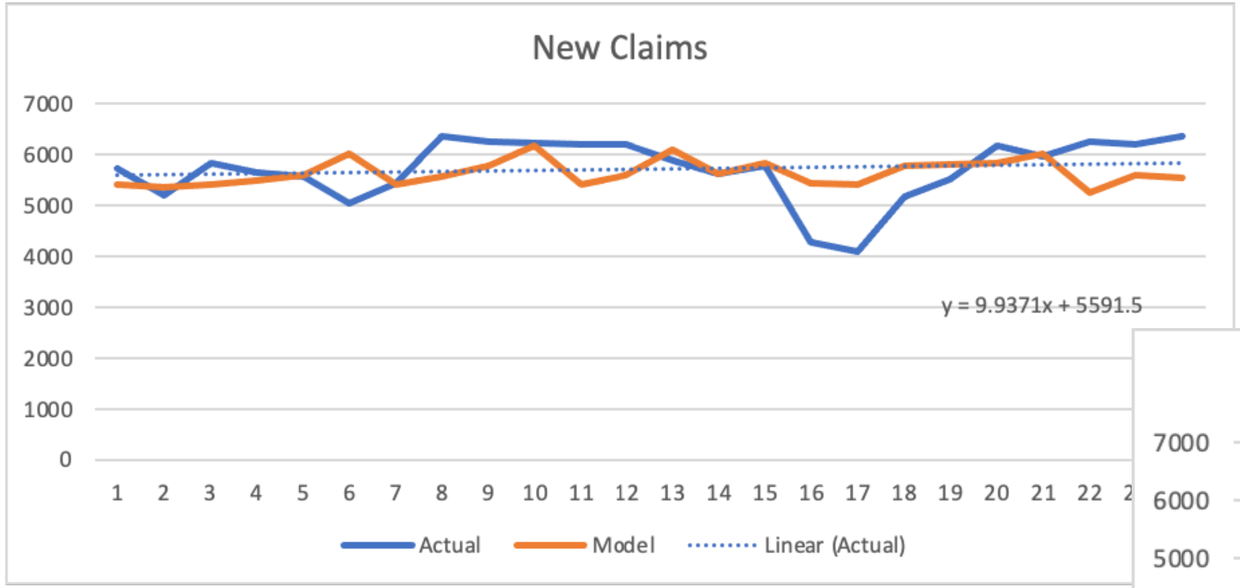
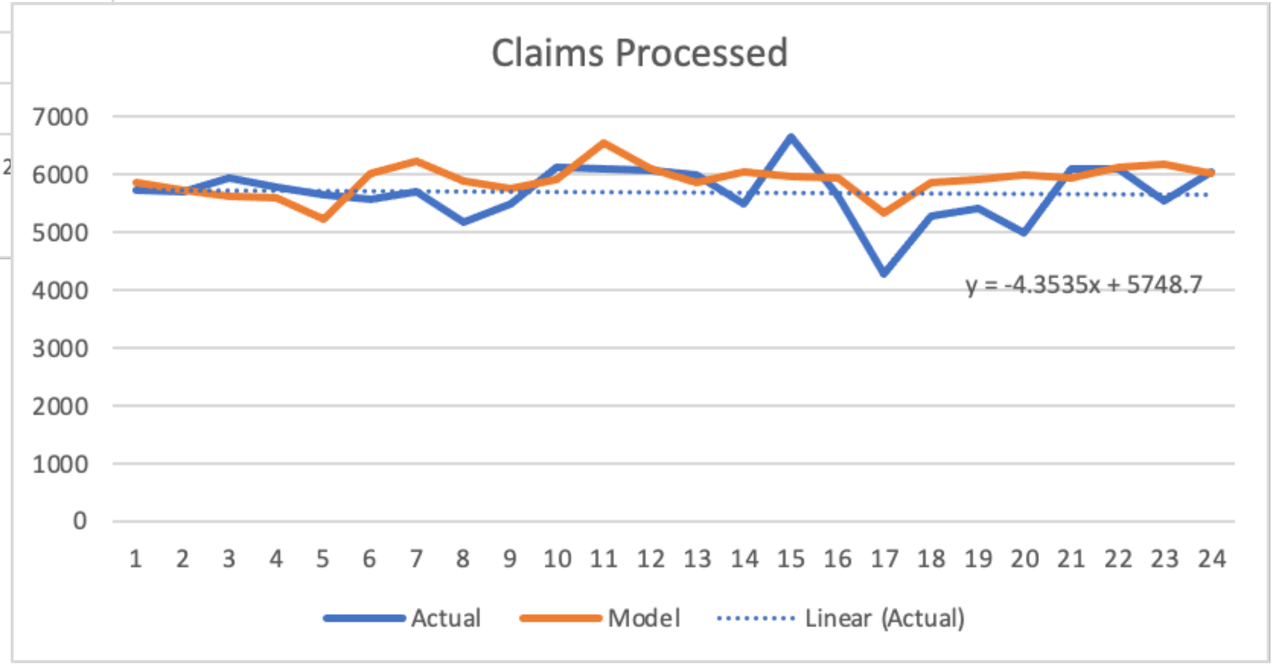
<New Graduate Training>
Net Skill Obsolescence
Outdated Rate
<Average Experience>
<New Graduates Hire>
New Grad Monthly Pay
New Grad Month Pay

Model's Fit to Actual Data

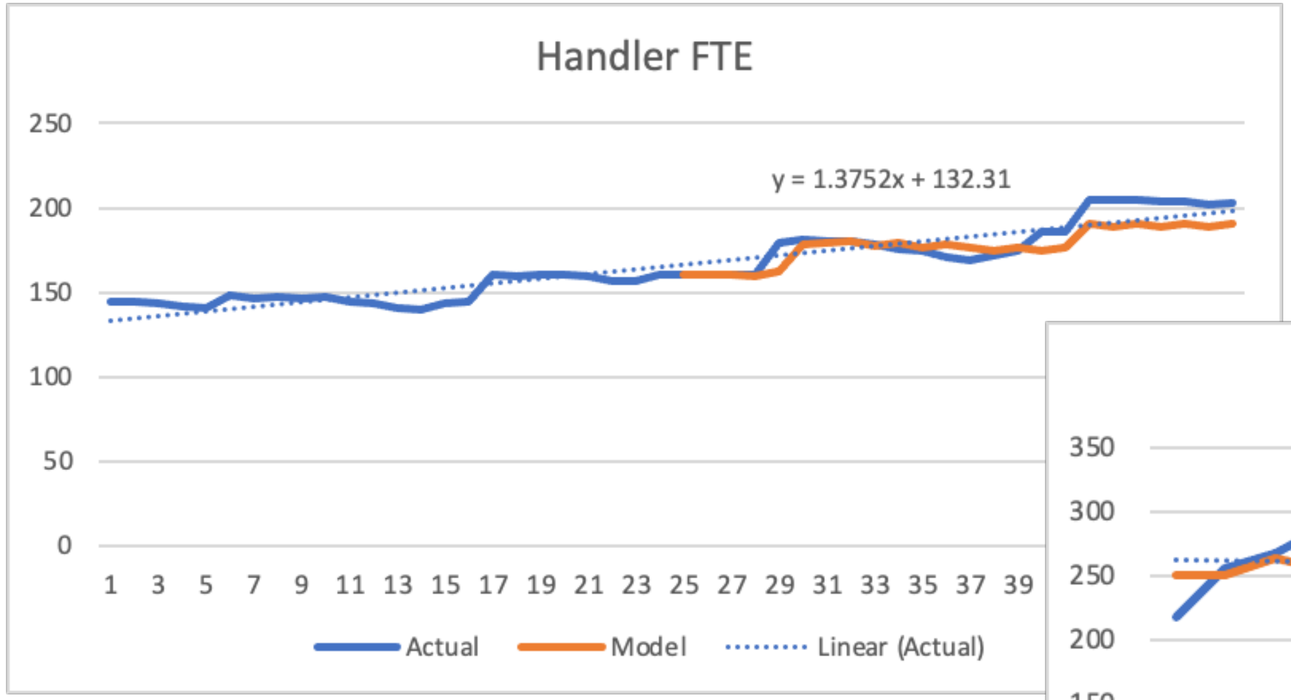
New Claims & Claims Processed (2019 - 2020 24 months)

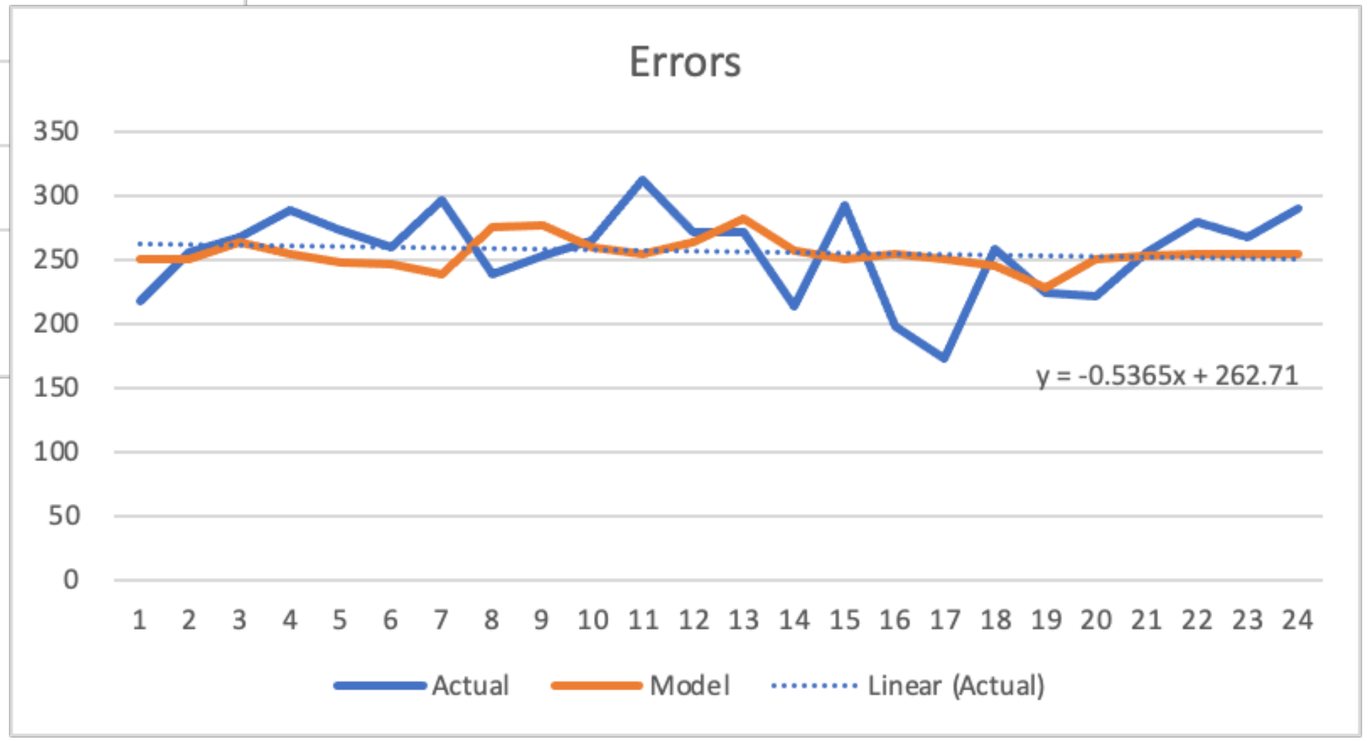




Model's Fit to Actual Data

Claim Handler FTE & Errors (2019 - 2020 24 months)





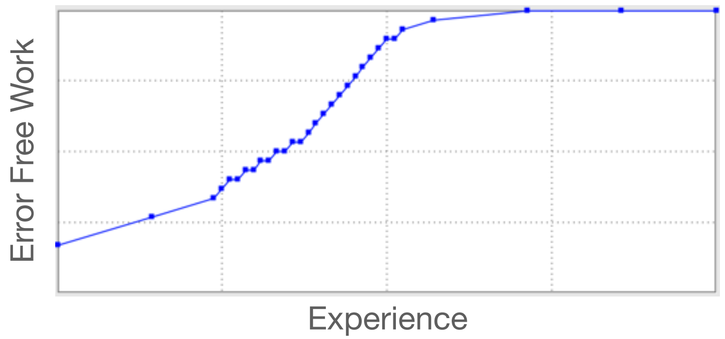
Key Constants & Assumptions

Constants:

- New Graduate Pay : Non Graduate Pay = 1.00 : 1.34 (JPY3,063 : JPY4,104 hourly wage equivalent)
- New Graduates are hired at 9.13% of the total handlers over 4-year period (2017 - 2020).
- New Graduates go through 2-month ‘desk’ training, which is followed by 4-month on-the-job training with a mentor assigned. A New Graduate’s productivity is assumed to be none during the ‘desk’ training and 75% when starting the on-the-job training and 100% at its completion. A mentor is assumed to operate at 80% productivity during the on-the-job training. ‘Productivity’ is expressed in the number of cases handled per period.

Assumptions:

- Hires from the market are assumed to have an average of 12 months work experience. Their training period is assumed to be one week or less.
- Collective experience of claim handlers is set initially to 3,600 months.
- Net depletion of such collective experience is set to 10% per year aside from the effect of attritions. This is assumed to take place changing technologies and products / services.
- More experienced a handler is, less prone to make errors.



Simulation I - Skill & Experience Obsolesce

Simulation II - New Graduate Hiring

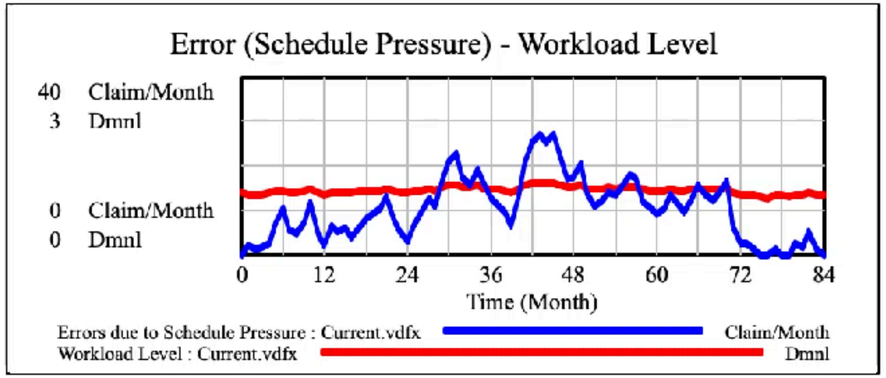
Simulation I - Skill & Experience Obsolescence

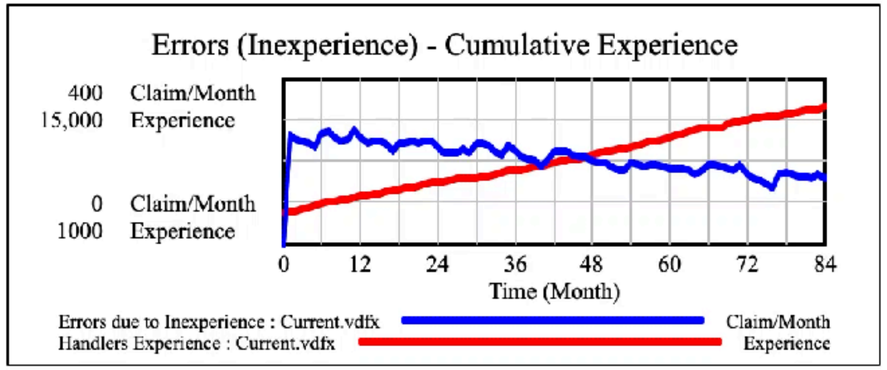
‘Handlers Experience’ represents accumulation of the handlers’ work experience and skills. It can be depleted by **turnover and inexperienced new hires.** Also, it can takes place due to **current skills & experience becoming obsolete.**

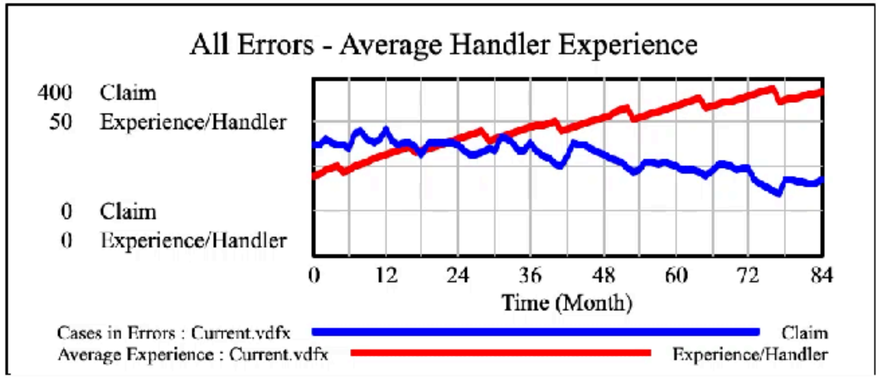
Obsolescence of ‘Handlers Experience’ is simulated between 10% and 50% per year.

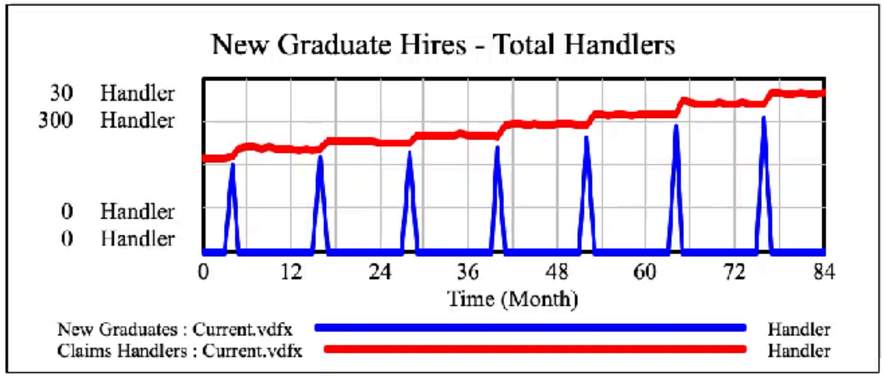
It would require the obsolesce rate at 50% for‘Handlers Experience’ not to accumulate

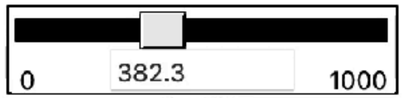
In the case studied, this is unlikely. However, the pace of new product launch is increasing.





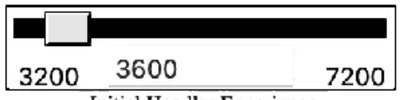






Variability

'Variability' is fluctuation of incoming claim volume. 382 indicates StDev of incoming claims.

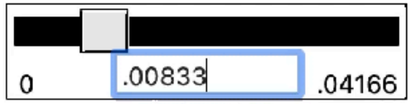


Initial Handler Experience

Initial cumulative experience of all handlers: The experience's effect is shown by 'Experience Effect'. It sets 72 exeprience-equivalent to have no errors.

Overhead Factor

'Overhead Factor' recognizes a new graduate hire's productivity cannot be equivelant with full time experienced handler. 0 is no adverse productivity impact. 0.5 represents productivity is reduced by 50%.



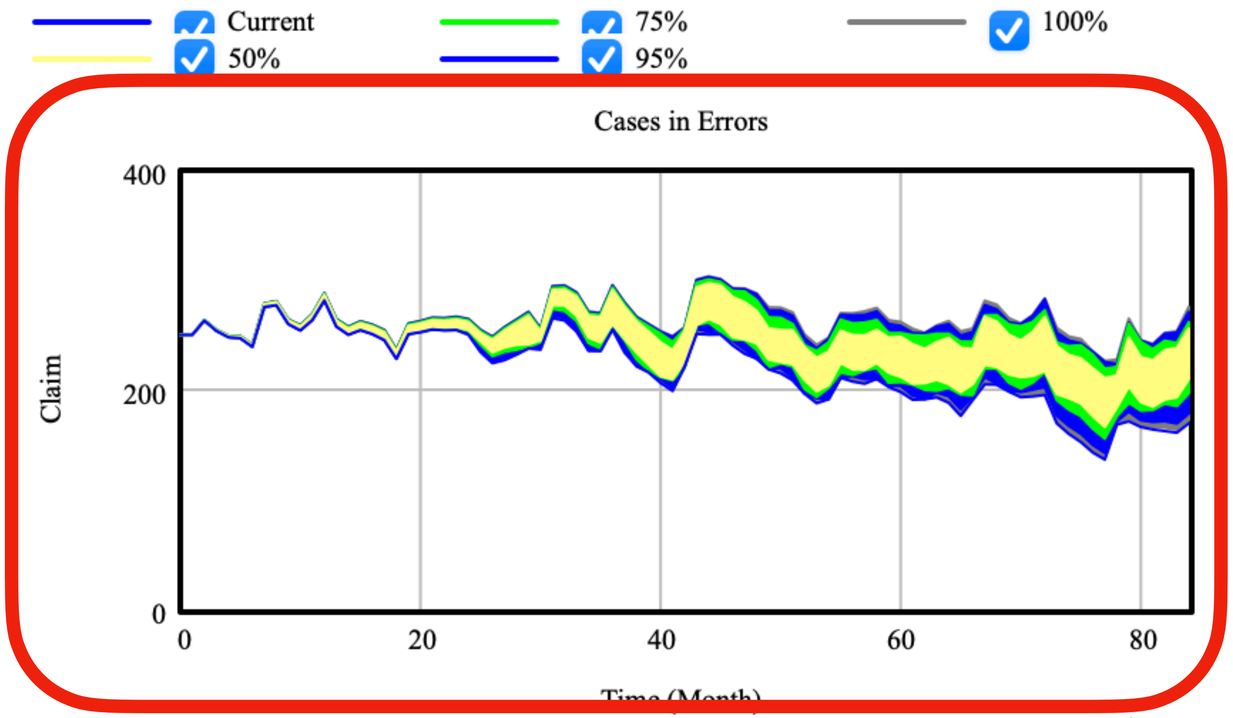
Outdated Rate

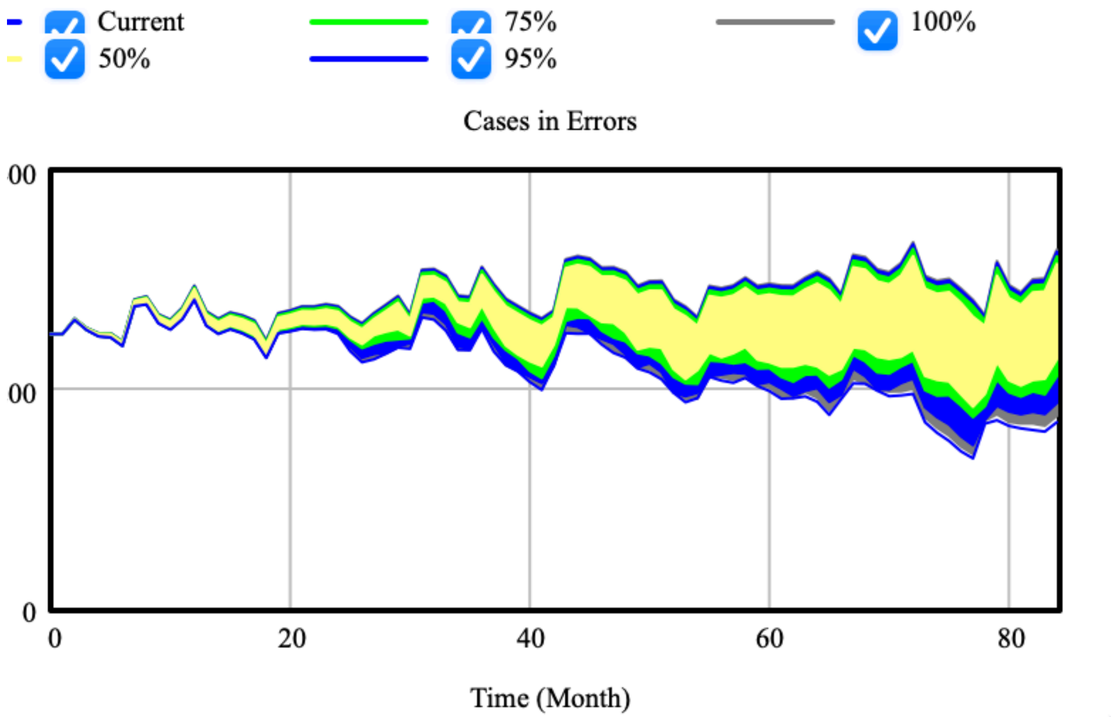
'Outdate Rate' is the rate by which accumulated experience depletes over time due to factors such as technology changes, products updates, and general work environment. The value 0 signifies no loss of the accumulated experience of a handler.

New Graduate Percent

'New Graduate Percent' is a percent of new graduate hires against total size of handlers.

Simulation I - Skill & Experience Obsolescence





Obsolescence Rate: Set Min = 0.1 Max = 0.2

Obsolescence Rate: Set Min = 0.1 Max = 0.3

- **Sensitivity of Errors**: When the obsolescence rate exceeds 20%, the number of the errors can increase in a long run.

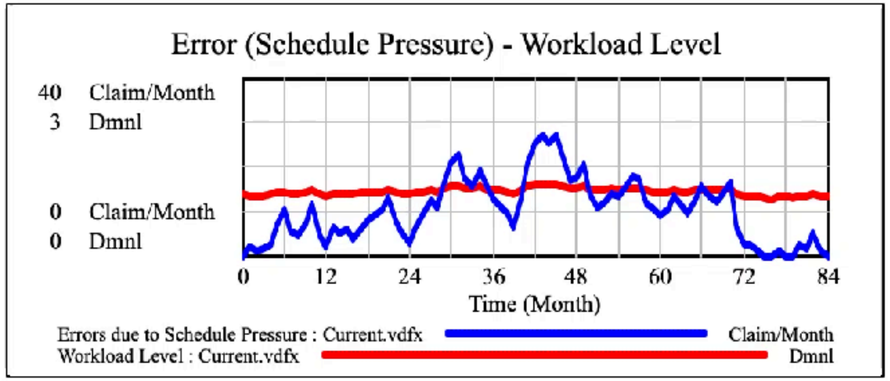
Simulation II - New Graduate Hiring

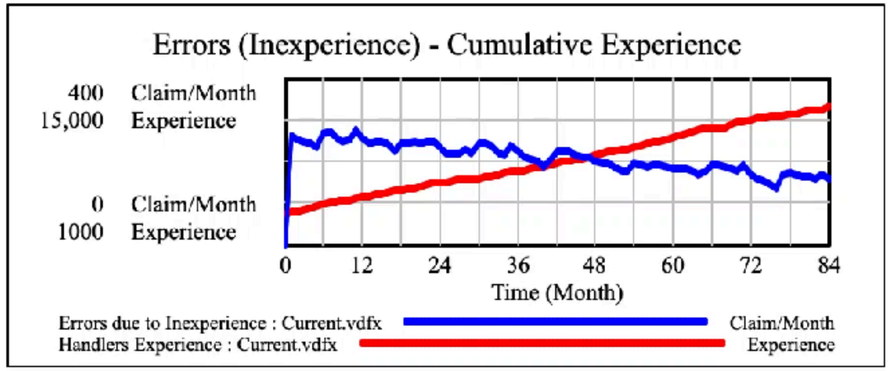
The company in this study hires new graduates every year that represent approx. 9% of the total claim handlers.

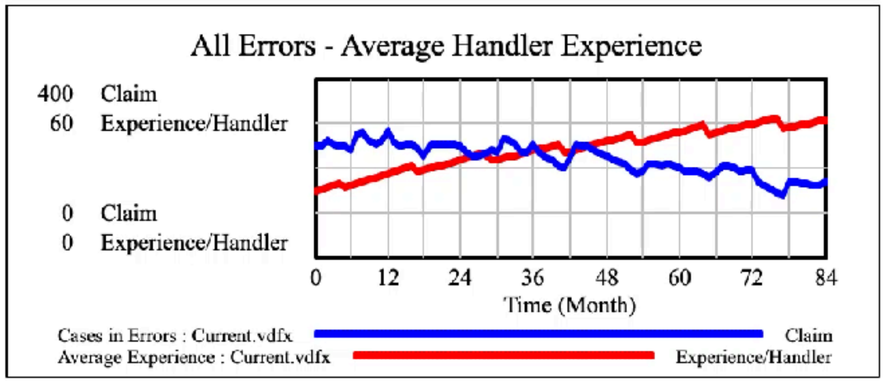
A simulation is made for an alternative policy of no new graduate hiring, but hiring solely from the market.

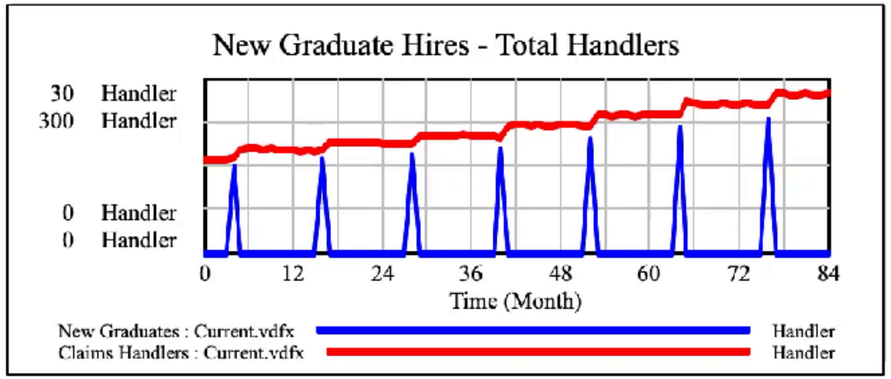
The left graphs show the current hiring policy. The right graphs show the alternative policy.

The simulation shows better quality (i.e. less errors) attained by the alternative hiring policy.









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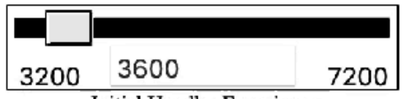

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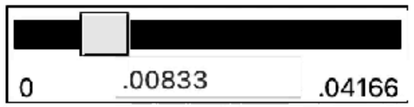

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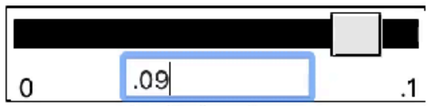

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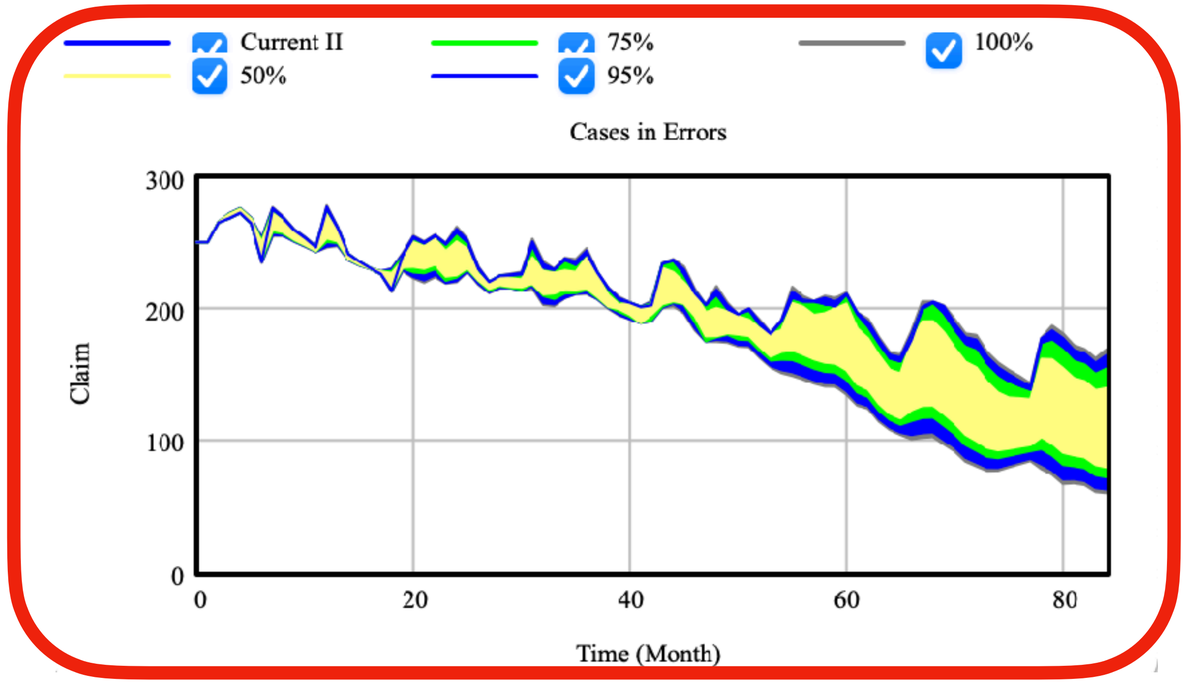
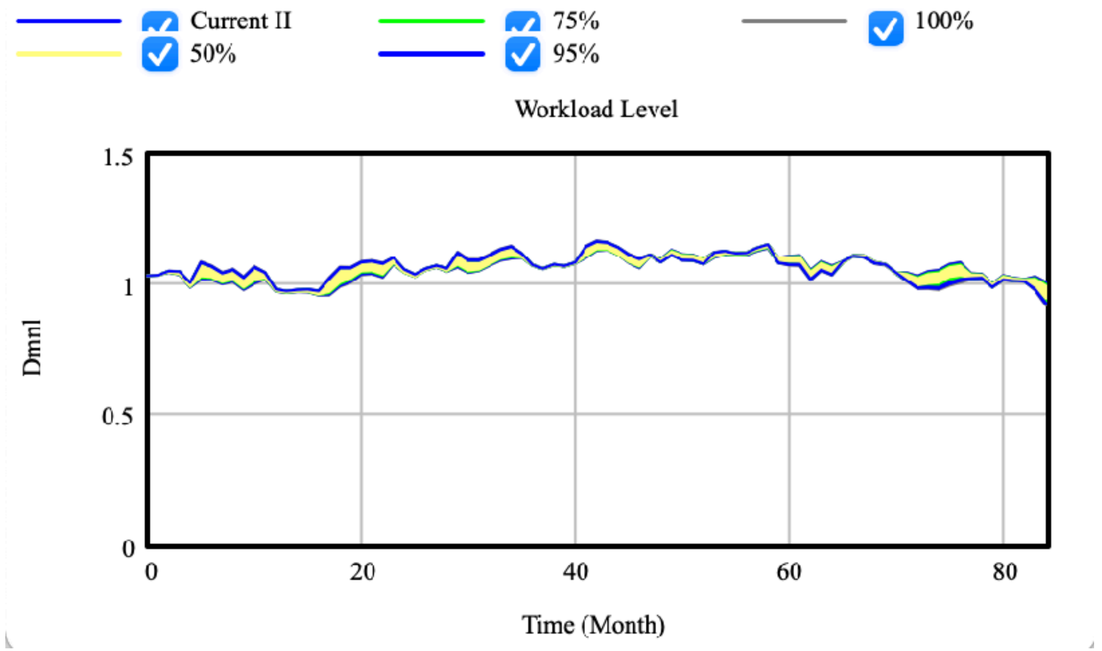
Simulation II - New Graduate Hiring



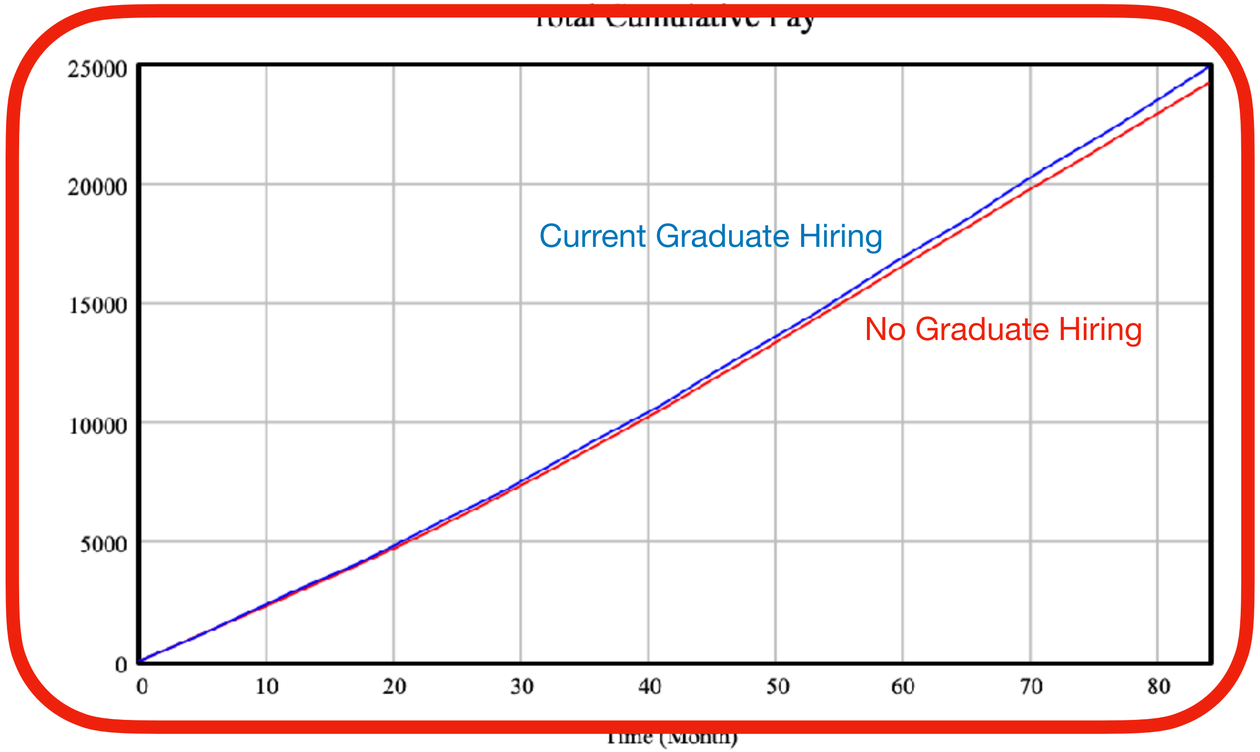


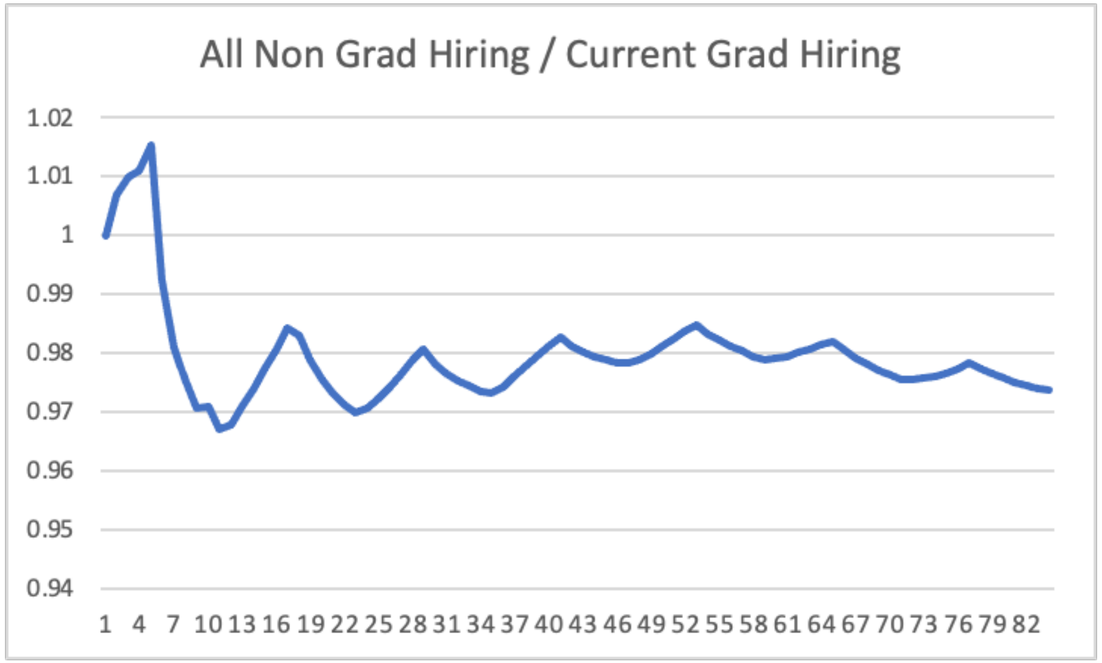
New Graduate Percent: Set Min = 0 Max = 0.1 Used uniform probability distribution for random values

- **Sensitivity of Errors**: Less new graduates are hired, less number of errors can be expected over time. The 9% new graduate hiring policy represents nearly the upper limit of the areas in the graph.
- **Sensitivity of Workload Level**: No significant sensitivity is observed.

Simulation II - New Graduate Hiring

Cost Differentials Between Two Policies: New Graduate Hires vs. No Graduate Hires





Key Constants and Assumptions:

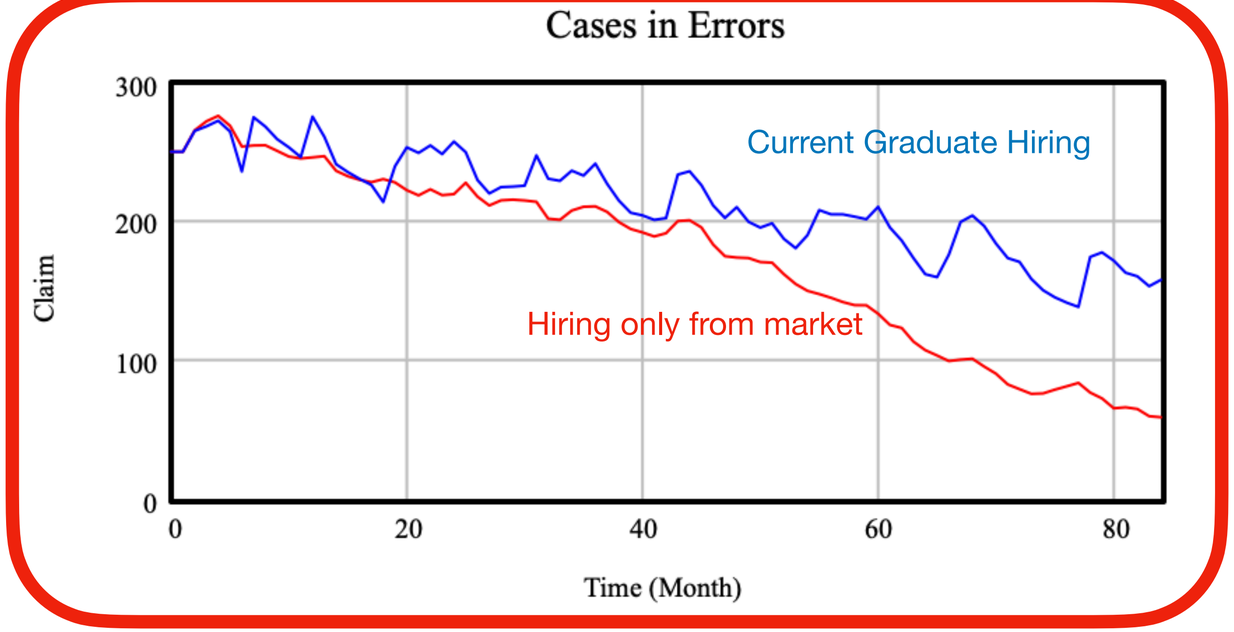
- New Graduate Hourly Wage : Non Graduate Hourly Wage = 1.00 : 1.34
- Non Graduate Hires are assumed to have an average of 12 months work experience with minimal onboarding orientation needs.
- Processing capacity is kept same between the two policies.

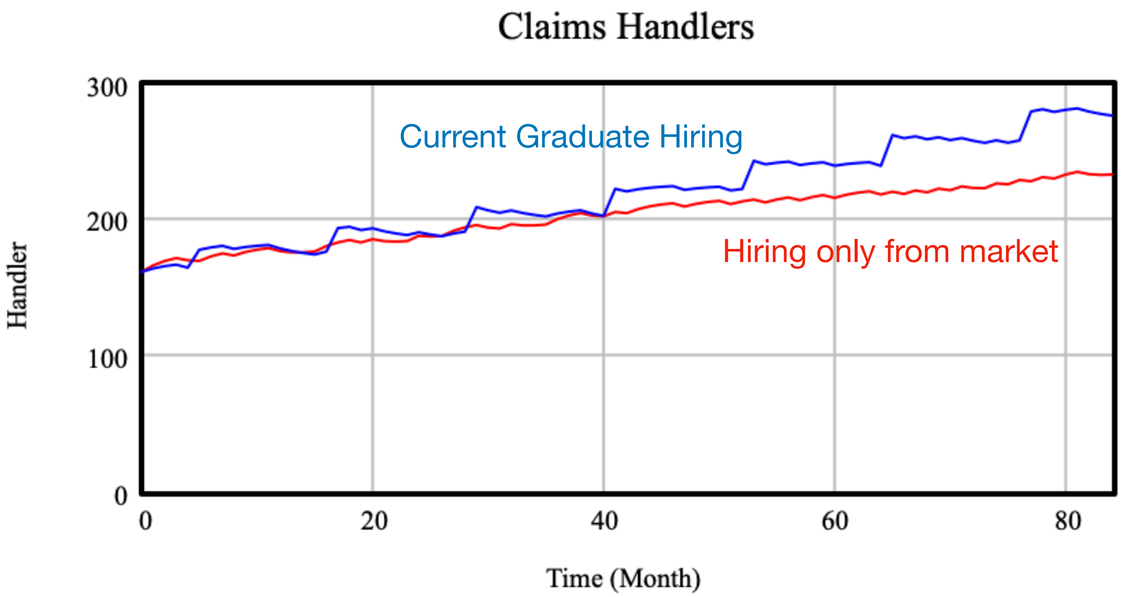
Key Commentary:

- If no graduate hiring is made, but the resources are supplied by non graduate hiring, the pay roll cost differential would be that the non graduate hiring policy would likely stabilize at between 97% and 98% of the current graduate hiring practice, but will have higher cost in the initial five months.

Simulation II - New Graduate Hiring

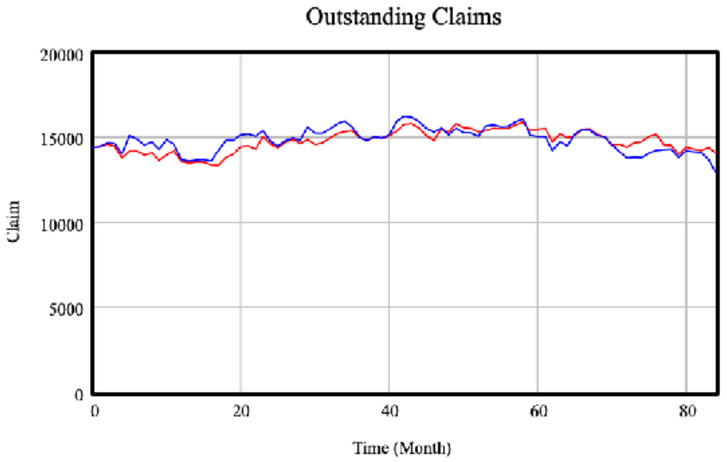
Source of Cost Differential





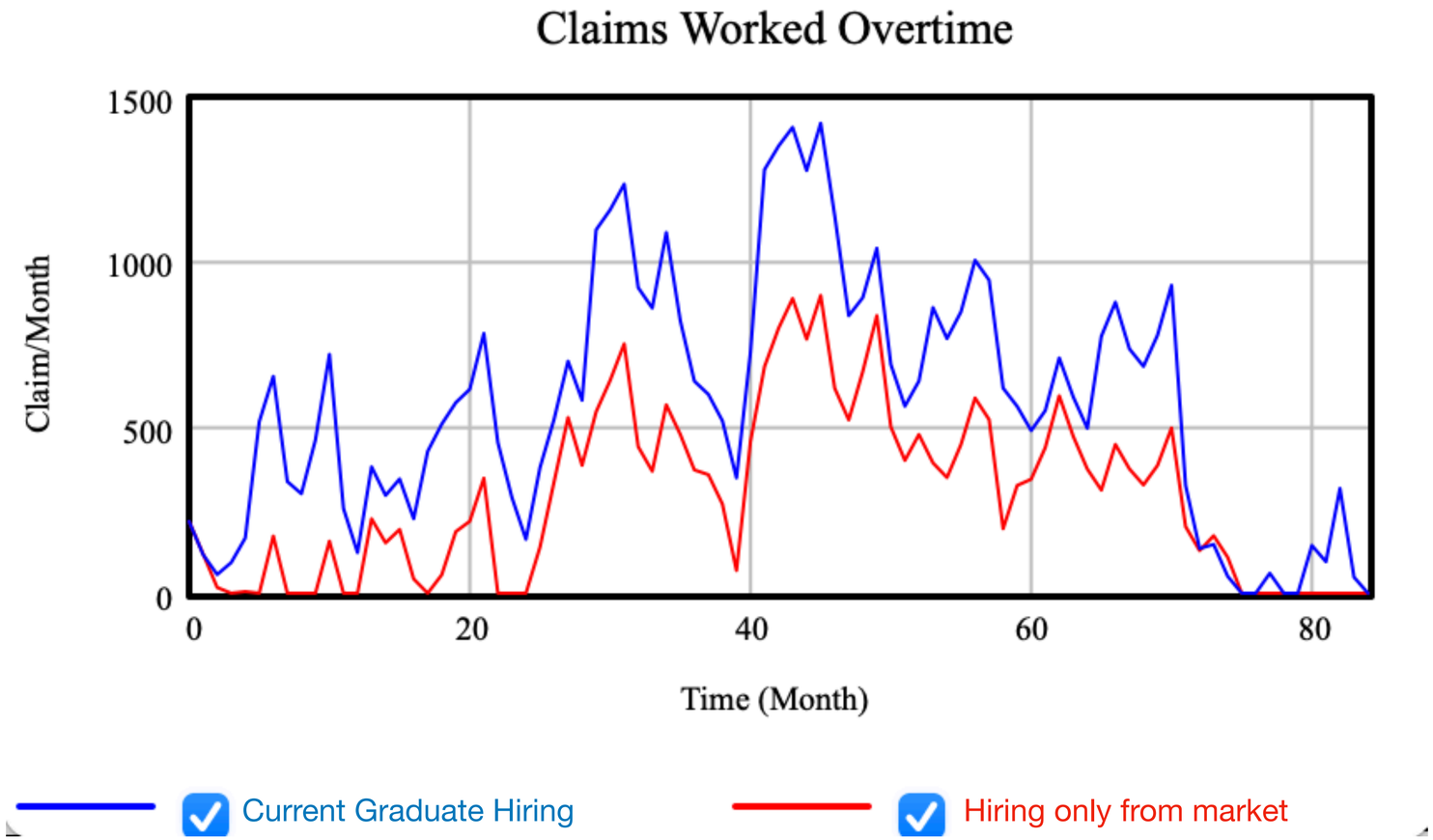
Key Commentary:

- The cost differential is reduction in errors that require rework, leading to less headcount of claim handlers required to maintain the same processing capacity.



Simulation II - New Graduate Hiring vs Market Hiring

Source of Cost Differential



Summary

- New graduate hiring policy's benefit of lower costs does not overweigh an alternative resourcing strategy where attritions are replaced by candidates from the market, despite the higher costs of such hires.

- With nearly equal payroll expenditure, the alternative policy would reduces the number of errors and overtime, alleviating claims handlers from work stress that can have adverse consequence.

- This is driven by the training overhead of new graduate hires.

- While management has been uncertain the cost benefit of the policy of new graduate hiring, the study provided a quantitative view of the policy implications.

Thank you