

MOVER STAYER MODEL

21/6

The mover stayer model is a statistical modelling approach used to analyze longitudinal data, especially to identify & characterize different patterns of behavior or trajectories within a population over time.

- It is often employed in the field of social sciences, such as psychology and sociology to understand individual differences in stability versus change.

→ The Mover Stayer model assumes that individuals within a population can be classified into 2 distinct groups:

i) movers & ii) stayers

movers are individuals whose behavior or characteristics change significantly over time, while stayers are individuals who remain relatively stable in their behavior.

→ The model aims to estimate the proportion of movers and stayers in the population and to identify the specific trajectories associated with each group.

- In the mover-stayer model, each individual is assigned a latent class membership indicating whether they belong to the mover or stayer group. The membership is modelled using a binary indicator

variable, where 1 represents the mover group and 0 represents the stayer group.

- The model estimates the probabilities of transitioning b/w latent class membership at each point of time capturing the probabilities of moving from stayer group to the mover group or vice versa. These transition probs. are often represented using transition matrices.
- The mover-stayer model can provide valuable insights into the heterogeneity of trajectories within a population and the factors associated with different patterns of behavior.
- It allows researchers to understand the proportions of individuals who exhibit stability versus change, the timing of transitions b/w groups and the characteristics associated with each group.

SCENARIO OF MOVER STAYER MODEL:

Consider a study that aims to understand patterns of job satisfaction among employees in a large organization over a five-year period. The researchers are interested in identifying distinct groups of individuals based on their trajectories of job satisfaction. Those who experience significant changes

in job satisfaction (movers) and those who remain relatively stable (stayers).

The study collects data on job satisfaction levels from a sample of employees at multiple time points (e.g. Annually) over the five year period. Each employee's job satisfaction is measured using a standardized questionnaire on a scale of 1 to 10.

→ The mover stayer model is applied to this data to identify latent groups and estimate the proportions of movers and stayers.

→ The researchers estimate the transition probabilities between the mover and stayer groups. For example, they may find the probability of transitioning from the stayer group to the mover group is higher for employees who experience significant organizational changes (e.g. promotion, relocation) compared to those who do not.

Conversely, the probability of transitioning from the mover group to the stayer group may be higher for employees who receive additional support or experience improvement in their work conditions.

By Applying the mover stayer model, the researchers gain insights into the proportion of employees who exhibit stable job satisfaction.

over time and those who experience significant changes. They can also examine factors that contribute to transitions b/w the mover-stayer groups, such as individual characteristics, job related factors or organization changes.

→ These findings can help the organization identify strategies to retain and engage employees who are prone to changing job satisfaction levels and provide support to individuals experiencing declines in job satisfaction. Additionally, it may inform targeted interventions or policies to enhance job satisfaction and overall employee well-being.

APPLICATION OF MARKOV CHAIN AND MOVER-STAYER MODEL TO MODELING REPAYMENT BEHAVIOR OF BANK LOAN GRANTEES.

The application of Markov chain and mover-stayer model to model the repayment behavior of bank loans' grantees can provide valuable insights into the dynamics and patterns of loan repayment. Here's how the models can be utilized in this context.

① MARKOV CHAIN : A Markov chain can be employed to model the transition probabilities of loan repayment behavior over time. In this

case, the states of the Markov Chain represent different repayment statuses such as 'current', 'delinquent', 'defaulted' or 'repaid'. The transition probabilities b/w these states capture the likelihood of moving from one repayment status to another within a given time period.

The historical data on loan repayment behavior can be used to estimate the transition probabilities. For instance, the data might reveal that borrowers who are currently delinquent have a higher prob. of transitioning to default than transitioning back to a current status. These transition probs can then be used to project ~~future~~ future repayment behavior and assess the risk associated with different loan portfolios.

② The MOVER-STAYER MODEL:

The mover stayer model can complement the Markov chain by identifying distinct groups of loan grantees based on their repayment behavior patterns. The model can partition the grantees into 2 latent classes: movers and stayers.

→ movers are grantees who exhibit significant changes in their repayment behavior over time; while stayers are grantees who

maintain relatively stable repayment behavior. The proportions of movers and stayers can be estimated using statistical techniques, such as maximum likelihood estimation or Bayesian methods, based on the observed loan repayment data.

By employing the mover-stayer model, you can gain insights into the characteristics and factors associated with different repayment trajectories.

For eg. you might find that borrowers who experience positive changes in their financial circumstances or receive additional support are more likely to transition from the mover to the stayer group.

The combination of a Markov chain and a mover-stayer model allows for a comprehensive analysis of loan repayment behavior. The Markov chain captures the overall dynamics and probabilities of transitioning between different repayment statuses, while the mover-stayer model identifies distinct groups and characterizes their unique repayment patterns.

→ This modeling approach can help banks & financial institutions assess credit risk, develop targeted strategies for borrower support or intervention, and make informed decisions regarding loan portfolio management and risk mitigation.