

Credit Risk Management: The Evolutionary Path of the Lost-Linking Mode of Loan Customers

Jiaqi Wang¹, Yunfeng Zhang², Xiaolong Jiang^{3,*}, Huiqiang Kang¹, Chao Deng⁴, Yizhou He⁵

¹Faculty of Logistics, Guangdong Mechanical & Electrical Polytechnic, Guangzhou, Guangdong, China

²Continuing Education College, Guangzhou City Construction College, Guangzhou, Guangdong, China

³Macao Polytechnic University, Macao, Guangdong, China

⁴Guangdong Rural Credit Union, Guangzhou, Guangdong, China

⁵School of Management, Jinan University, Guangzhou, Guangdong, China

*Corresponding Author.

Abstract: The evolution of financial markets, coupled with the expansion of credit services, has progressively rendered the phenomenon of lost-linking among loan customers as one of the significant risks confronting financial institutions. This research conducts an in-depth analysis of the evolutionary path of the lost-linking mode among loan customers, identifying and defining three typical behavioral modes: Hide and Seek mode (HS mode), Flee with the Money mode (FM mode), and False Disappearance mode (FD mode). Through detailed elaboration on behavioral characteristics, overdue loan information, changes in lost-linking information, and the evolution of social relationships, this study reveals the transition process of customers from a normal repayment status to a lost-linking status. The research proposes a comprehensive framework that describes different evolutionary paths customers may experience, including a gradual progression from a normal status to HS mode and then to FD mode, a direct transition from a normal status to FM mode and ultimately to FD mode, and a path where a normal status directly evolves into FD mode. These findings provide a theoretical foundation for risk assessment and prevention strategies for financial institutions, emphasizing the importance of dynamic monitoring and timely intervention in loan risk management.

Keywords: Loan Customers; Lost-linking Mode; Evolutionary Pathways; Credit Risk; Risk Management

1. Introduction

The ongoing evolution of financial markets and the swift expansion of credit services have increasingly positioned the phenomenon of loan customers' lost-linking as a significant risk faced by financial institutions. Lost-linking refers to the inability of lending institutions to effectively trace the customers through their reserved contact information or third-party channels within a predetermined observation period, leading to impediments in credit management and collection activities. This phenomenon not only exacerbates the credit risk of financial institutions [1,2], but also poses a severe challenge to their stability and sustainable development [3,4].

The "Lost-linking Mode" is a strategy adopted by loan customers to evade debt responsibilities, characterized by the intentional creation of a state of being uncontactable. The prevalence and complexity of this behavioral pattern can no longer be ignored. To better understand and address this issue, academia and industry have conducted in-depth research from various perspectives.

Early studies focused on the identification of static characteristics of lost-linking customers, analyzing vast amounts of loan customer data to identify warning signals before lost-linking, such as frequent changes in customer information and the instability of income sources [5,6]. However, these studies mainly concentrated on the static manifestations of the lost-linking phenomenon, lacking in-depth discussion on the dynamic evolution process of the lost-linking modes.

As research progressed, scholars began to

employ methods such as time series analysis to reveal that the phenomenon of lost-linking does not occur instantaneously but is a gradual process involving multiple transition stages [7]. Empirical research by [8] further indicated that customers' credit quality and economic conditions are closely related to their risk of lost-linking, especially when facing economic pressures or life changes, customers are more likely to choose lost-linking as a means of evading debt.

At the same time, technological advancements have provided financial institutions with more effective means to track and locate lost-linking customers. For instance, customer behavior analysis based on big data and intelligent algorithms enables financial institutions to monitor customer dynamics in real-time, enhancing the efficiency of lost-linking risk prevention [9-11]. Despite this, the specific evolutionary path from a normal state to a lost-linking state for loan customers, as well as the key transition points and influencing factors, still require further in-depth research. Building on previous research, this study deeply analyzes the evolutionary trajectories of the lost-linking modes of loan customers, identifying and defining three typical

behavioral patterns: "Hide and Seek mode (HS mode)," "Flee with the Money mode (FM mode)," and "False Disappearance mode (FD mode)." By thoroughly discussing these patterns, this study reveals the complete process of customers transitioning from a normal repayment state to a lost-linking state, either gradually or abruptly. It provides financial institutions with more targeted risk management methods and preventive strategies to ensure their robust operation and sustainable development.

2. Types of Lost-Linking Modes

In practice within the financial industry, while typical lost-linking behaviors like the HS mode, FM mode, and FD mode are recognized, a unified set of standards for defining and characterizing these behaviors remains absent. The industry tends to classify the patterns of lost contact among customers based on multi-dimensional factors such as difficulty in reaching them, loan delinquency, lost-linking information, and social relationships. Based on this logical framework, this paper will systematically summarize and define the aforementioned three lost-linking modes and delve into their distinct attributes.

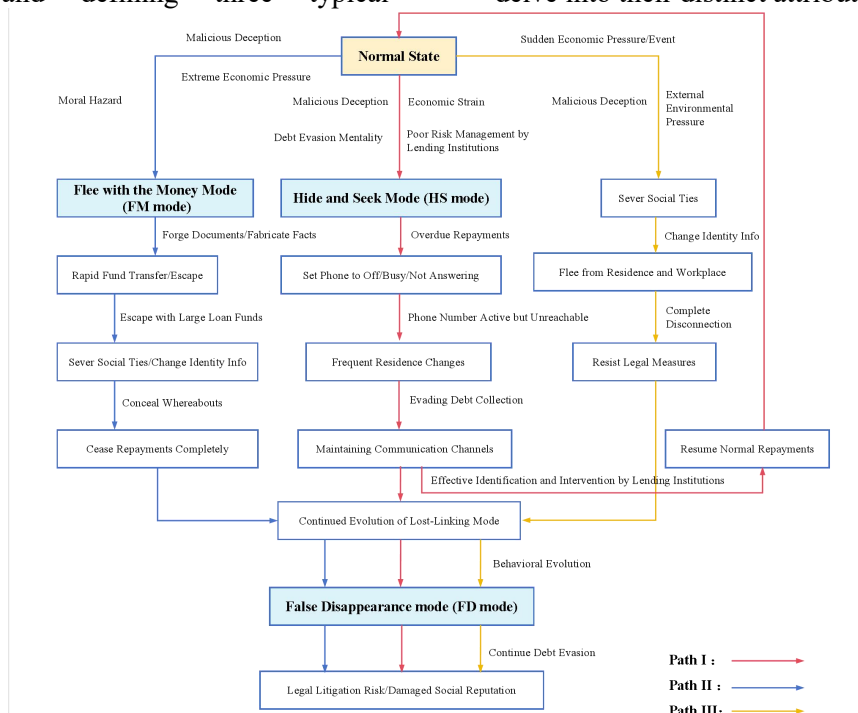


Figure 1. The Evolutionary Path of the Lost-linking Mode of Loan Customers

The HS mode manifests as evasive behaviors adopted by loan customers facing economic pressure or a tendency to evade debt. These behaviors include overdue loan repayments,

intentionally turning off their phones, refusing to answer calls, and frequently changing residences, all aimed at reducing contact with lending institutions while retaining a limited

possibility of contact, such as maintaining the active status of their mobile phone numbers.

The FM moderefers to the behavior of loan customers who, after obtaining a substantial loan, unilaterally sever contact with lending institutions by shutting down or deregistering their mobile phone numbers and taking extreme measures, such as fleeing their usual place of residence with the loan funds, in order to completely evade debt collection. This behavior indicates the customer's clear intention to maliciously evade their debt obligations.

The FD mode involves loan customers deliberately creating a state of apparent disappearance to evade debt. They do this by shutting down their mobile phones, deregistering their numbers, leaving their usual place of residence and workplace, and severing all social ties to conceal their whereabouts. This behavior demonstrates a high degree of evasion intent and strategic thinking by the customer, posing a significant challenge for lending institutions in their efforts to collect debts.

These three lost-linking modes are common strategies employed by loan customers to evade debt and hold considerable reference value for financial institutions when assessing the lost-linking status and debt evasion intentions of their customers. However, it is important to note that as time and circumstances change, the customer's intentions and lost-linking characteristics may also evolve. Therefore, the lost-linking mode should be regarded as a relatively static description within a specific timeframe, rather than a fixed and unchanging state, and there is potential for transition to other modes.

3. Evolutionary Pathways of Loan Customer Lost-Linking Modes

The evolution of lost-linking modes among loan customers represents a dynamic process that evolves continuously in response to shifts in customer behavior, intentions, and the broader external environments and contexts. Based on the analysis of the HS mode, Flee with the FM mode, and FD mode, this study introduces three pathways: "Normal State → HS mode → FD mode", "Normal State → FM mode → FD mode", and "Normal State → FD mode", revealing the evolutionary pathways of loan customer lost-linking modes. As shown

in Figure 1.

3.1 Path I: Evolution from Normal Status to HS Mode, and Further to FD Mode among Loan Customers

In the credit lifecycle of loan customers, the initial phase may be characterized by a state of normal repayment, where loan customers exhibit a strong willingness to repay and a cooperative attitude towards communication, fulfilling their repayment obligations on time and responding positively to contact from lending institutions. However, as economic pressures mount or a psychology of debt evasion takes root, loan customers may gradually enter the HS mode.

Under the HS mode, loan customers begin to display evasive behavioral traits, such as overdue repayments and avoiding communication. They may not answer calls from lending institutions, set busy signals, fail to reply to emails or messages, and even frequently change their places of residence to evade potential collection actions. Despite this, they still maintain a certain level of contact accessibility, such as keeping their mobile numbers active but difficult to reach effectively.

If lending institutions fail to take timely and effective countermeasures, the HS mode exhibited by loan customers is highly likely to evolve further into the FD mode. At this stage, loan customers completely cease repayments and cut off all contact channels with lending institutions. They may change all contact information, flee their original place of residence, and sever social relationships to completely free themselves from debt constraints. Concurrently, their psychological state undergoes significant changes, manifesting deep despair and resignation, and developing a strong aversion to financial institutions and legal measures.

In the progression from a normal state through the HS mode to the FD mode, the loan customer's intent to evade debt intensifies, and the characteristics of disconnection become increasingly evident. Lending institutions face considerable difficulty in tracking and collecting debts at this stage, as loan customers have meticulously planned and implemented a series of measures to conceal their whereabouts and evade debt responsibilities.

In Pathway I, the development from the HS mode to the FD mode is typically a gradual process, mainly based on the following factors: Firstly, lending institutions fail to identify and take effective intervention measures in a timely manner. If lending institutions do not keenly detect and take corresponding measures, such as intensifying collection efforts, engaging in in-depth communication with loan customers to understand their predicaments and offering possible solutions, they give loan customers the illusion that their evasive behaviors are not receiving sufficient attention and restraint.

Secondly, the loan customer's economic pressures continue to increase, or the psychology of evading debt is further reinforced. Perhaps the loan customer initially only intended to temporarily evade collection, but as time passes and the economic situation worsens, unable to bear the debt, they decide to completely give up on repayment and contact.

Furthermore, external environmental influences may also play a role in promoting this evolution. For example, loan customers may be influenced by similar successful debt evasion cases within their social circles or misled by negative information, believing that complete disconnection can free them from debt.

Specifically, in the HS mode, loan customers, although occasionally avoiding communication, still maintain a certain level of contact accessibility. However, when they develop into the FD mode, loan customers will completely stop repaying, change all contact information, flee their original place of residence, and sever social relationships. Psychologically, they also shift from having some hesitation to deep despair and resignation, developing a strong aversion to financial institutions and legal measures.

For example, a loan customer in the HS mode might simply not answer calls and occasionally be overdue. However, due to long-term economic difficulties that cannot be alleviated and without effective help and guidance from lending institutions, they ultimately decide to change their mobile phone numbers, relocate to another city, and delete all contacts related to loans, entering the FD mode.

3.2 Path II: Evolution from Normal State Directly to the FM Mode and Subsequently to the FD Mode for Loan Customers

In certain circumstances, loan customers may directly transition from a normal state to the FM mode. This abrupt change typically occurs when loan customers face sudden economic pressures or unforeseen events, leading them to resort to fraudulent tactics such as fabricating documents and inventing facts to deceive lending institutions and gain their trust. Subsequently, they swiftly transfer funds and abscond.

Under the FM mode, the behavior of loan customers becomes particularly egregious and deceitful. They not only cease repayments entirely but also exploit fraudulent means to gain improper benefits and flee their original place of residence to evade potential legal accountability. If lending institutions fail to detect and act promptly, loan customers will rapidly enter the FD mode, further severing all contacts and concealing their whereabouts.

During the evolution from the normal state directly to the FM mode and then to the FD mode, loan customers' actions to evade debt become more rapid and covert. They utilize fraudulent means to secure undue profits and meticulously plan their escape to completely free themselves from debt obligations. Lending institutions face significant risks and challenges at this stage, as loan customers' fraudulent activities and sudden disconnection introduce considerable uncertainty and difficulty into the debt recovery process.

Factors influencing Path II primarily include: sudden economic pressures or significant upheavals that make loan customers feel unable to bear their existing debt burdens; a sharp increase in the moral hazard of loan customers, making them willing to engage in fraud to gain improper benefits; and lapses in risk management by lending institutions, which fail to detect loan customers' abnormal behavior in a timely manner and take appropriate measures.

For example, a business owner who was previously operating normally may face a sudden market change that leads to a breakdown in cash flow, resulting in immense economic pressure. In order to quickly obtain funds to fill the gap, he opts to forge financial statements and fabricate business contracts, successfully defrauding a lending institution

out of a substantial loan. He then immediately transfers the funds and flees his original place of residence, severing all contacts. By the time the lending institution detects the anomaly, the loan customer has already vanished, plunging the debt recovery efforts into a significant predicament.

3.3 Path III: Evolution from Normal Status Directly to the FD Mode

Under specific extreme circumstances, loan customers may transition directly from a normal repayment status to the FD mode. This abrupt change can stem from premeditated malicious deception by the loan customer or be triggered by sudden economic pressures or significant events. In cases of malicious deception, the loan customer harbors the intention to evade debt from the outset, and once the loan funds are received, they immediately take action to sever all contact with the lending institution and conceal their whereabouts. In contrast, under sudden events, the loan customer, who may have initially had the intention to repay, faces a drastic deterioration of their financial situation due to unforeseen external events, leading them to choose the FD mode to escape the unbearable debt burden.

In the normal state, these loan customers typically exhibit repayment capabilities and communication willingness that meet loan requirements. However, under the influence of malicious deception or sudden events, their behavioral patterns undergo a fundamental transformation. In the FD mode, the loan customer not only completely ceases repayment but also takes a series of measures to hide their whereabouts, such as changing identity information, fleeing their original place of residence, and severing social connections. These actions pose significant challenges and uncertainties for the lending institution in the debt recovery process.

The evolution from the normal status directly to the FD mode is characterized by a high degree of suddenness and concealment in the loan customer's debt evasion behavior. Whether due to malicious deception or sudden events, both can lead to the loan customer suddenly becoming uncontactable without any prior warning and taking extreme measures to hide their whereabouts. For lending institutions, this abrupt change makes the

recovery work extremely difficult, as the loan customer's resolute attitude and thoroughly concealed whereabouts bring great difficulty and loss to the recovery efforts.

The main factors influencing Path III include: premeditated malicious deception by the loan customer, aimed at evading debt responsibility from the start; sudden economic pressures or significant events that make the loan customer feel unable to bear the existing debt burden, leading to a desire to escape; and the negligence or insufficient response of the lending institution's risk management, failing to detect the loan customer's abnormal behavior in time and take corresponding measures to prevent the loan customer's sudden disappearance.

For example, a loan customer may successfully obtain loan funds through a carefully planned fraudulent scheme, then immediately sever all contact with the lending institution, and take a series of measures to hide their whereabouts to evade debt responsibility. Another example is a business owner who was previously stable but faced a sudden deterioration in their financial situation due to market fluctuations or natural disasters, leading to significant economic pressure and reconstruction difficulties. Unable to bear the debt burden, they choose to suddenly cut off contact with the lending institution and take similar actions to hide their whereabouts. These two examples represent the evolution from the normal status directly to the FD mode caused by malicious deception and sudden events, respectively.

In summary, the evolution of loan customers' lost-linking modes is a complex and variable process. Under different paths, factors such as the loan customer's behavioral characteristics, psychological state, and external environment jointly influence the evolution of their debt evasion behavior and lost-linking characteristics. Lending institutions need to closely monitor changes in loan customer behavior and contact status, and take effective intervention measures in a timely manner to reduce loan risks and protect their own interests.

4. Risk Management Strategies for Loan Customers

To enhance the risk management practices of financial institutions concerning loan

customers, this study offers the following targeted recommendations.

4.1 Optimal Risk Management Measures for Loan Customers' Transition from Normalcy to FD Mode via HS Mode Path I

(1) Employ advanced data analysis tools, such as behavioral analysis and predictive modeling, to monitor early shifts in loan customer behavior. These changes may encompass subtle variations in repayment patterns, a decline in communication frequency, or an uptick in inquiries regarding loan terms. Upon detecting unusual signals, lending institutions should promptly engage with customers to assess their financial standing and potential challenges, offering necessary support and solutions.

(2) Modify repayment plans: In the face of emerging repayment difficulties, lending institutions should appropriately adjust repayment schedules to align with the current financial circumstances of loan customers. This may entail extending repayment periods, decreasing monthly installments, or granting temporary repayment moratoriums. Tailored repayment plans not only alleviate financial strain on customers but also mitigate default risks for lending institutions while preserving positive customer relationships.

(3) Offer legal counseling: It is recommended that lending institutions provide legal counseling to loan customers, helping them comprehend the legal repercussions of overdue payments and explore viable solutions. Furthermore, lending institutions can offer or recommend psychological counseling services to assist customers in managing financial stress and avoiding extreme actions, such as evading debt out of desperation.

Implementing these strategies will empower lending institutions to more effectively manage loan risks while offering crucial support to customers, aiding them in overcoming economic hardships and reducing the probability of disconnection and debt evasion.

4.2 Strategies for Loan Customers' Direct Transition from Normalcy to FM and FD Modes: Path II Countermeasures

(1) Reinforce pre-loan screening and continuous monitoring: Lending institutions must conduct thorough credit assessments

prior to loan disbursement, encompassing in-depth examinations of loan customers' financial statuses, business models, and historical credit records. Additionally, a continual monitoring system should be established to regularly review customers' business activities and financial positions, enabling the prompt detection of any abnormal changes; by leveraging advanced risk assessment tools and technologies, such as big data analysis and machine learning models, lending institutions can more precisely forecast and identify potential risk indicators.

(2) Establish a rapid response framework: When unusual or fraudulent behaviors are detected in loan customers, lending institutions should act swiftly, including but not limited to suspending loan disbursements, initiating legal proceedings, and engaging in urgent communications with customers; a rapid response framework necessitates lending institutions to possess agile decision-making processes and efficient execution capabilities to minimize losses resulting from customer fraud.

(3) Enhance legal and ethical risk awareness: Lending institutions should elevate awareness of ethical risks associated with loan customers and strengthen staff's capacity to identify fraudulent conduct through education and training. Simultaneously, stringent internal controls and compliance protocols should be implemented to ensure the transparency and fairness of loan operations; collaboration with legal advisors should be fortified to guarantee that legal action can be promptly taken upon discovering fraudulent behavior, including but not limited to asset freezing and recovery of ill-gotten gains.

Implementing these strategies will enable lending institutions to more effectively prevent and respond to the risks of loan customers transitioning directly from a normal state to the FM mode and then to the FD mode, thereby reducing potential economic losses and preserving the stability and order of the financial market.

4.3 Mitigating Credit Risks along Path III: Strategies for Lending Institutions to Address Abrupt Shifts to Foreclosure Mode in Loan Repayment

(1) Strengthen pre-loan screening and continuous monitoring: Lending institutions

must conduct meticulous credit assessments prior to loan disbursement, encompassing loan customers' financial statuses, credit records, historical transaction behaviors, and repayment capacities. Through rigorous pre-loan screening, lending institutions can filter out customers who genuinely intend and are capable of repaying, thereby mitigating risk at the outset. In addition to traditional financial analysis, the screening process should also consider customers' social behavioral characteristics and market reputations. This step is vital for identifying potential high-risk customers; post-loan, continuous monitoring is equally crucial. Lending institutions should utilize advanced data analysis tools to track customer repayment behaviors and transaction patterns in real-time, enabling the detection of subtle changes in customer behavior, such as abnormal fund flows and prolonged repayment cycles, to promptly identify and respond to abnormal behaviors or risk signals.

(2) Develop an emergency response mechanism: Lending institutions should establish and implement an emergency response mechanism to ensure prompt action when there is a drastic change in loan customer behavior, reducing instances of malicious debt evasion. This includes swiftly notifying relevant departments, suspending customer account services, and closely collaborating with legal teams and debt collection agencies. The mechanism should encompass the entire process from risk identification to action execution, ensuring that intervention can be swift and effective at the onset of customer disconnection, thereby minimizing potential losses.

(3) Fortify legal safeguard measures: Clearly delineate the legal consequences of default in loan contracts to increase the cost of default for loan customers and serve as a deterrent. The contract should include potential legal proceedings and compensation clauses to ensure that lending institutions have a clear legal basis for action when customers disconnect; lending institutions should closely collaborate with legal advisors to ensure that legal action can be promptly taken when customers disconnect, such as applying for asset preservation and initiating debt recovery procedures, to protect their own interests. Through the integration and implementation of these strategies, lending institutions can

establish a comprehensive risk management system to effectively prevent and respond to the risk of loan customers suddenly disconnecting, thereby protecting their asset security and market reputations.

5. Conclusion

This research explores the phenomenon of loan customers' lost-linking mode, providing a comprehensive view of the process through which loan customers transition from a state of normal contact to one of disconnection. A framework for the evolutionary path of the lost-linking mode of loan customers is proposed, which encompasses a variety of pathways, including the transition from a normal state through the Hide and Seek mode (HS mode) to the False Disappearance mode (FD mode), a direct leap from a normal state to the Flee with the Money mode (FM mode) followed by an evolution into the FD mode, and a sudden shift from a normal state to the FD mode. The detailed exposition of these pathways provides a solid theoretical foundation for financial institutions to gain an in-depth understanding of the internal mechanisms behind loan customers' disconnection. It offers new perspectives for lending institutions to identify the lost-linking modes of their customers, which is of significant importance for enhancing the risk management capabilities of lending institutions and reducing the risk of loan default. and lessons learned.

Acknowledgements

The research is funded by Guangdong Province Philosophy and Social Science Planning Project (No. GD24CGL35). Additionally, it is supported by Guangdong Province Characteristic Innovation Project for Ordinary Higher Education Institutions (No. 2023WTSCX179) and the High-level Talent Research Startup Fund Project by Guangdong Mechanical & Electrical Polytechnic (No. Gccrcxm-202308).

References

- [1] Liu L., Ma S., Guo B. 2018. The Inflection Point of Governmental Debt, Economic Growth and Systemic Risk. *Economic Perspectives*, (05): 30-41.
- [2] Yu Y., Zhang Y., Peng Y. 2021. *Economic Research Journal*. Economic

- Research Journal, 56(04): 93-109.
- [3] Pang S., Wang J., Xia L. 2022. Information Matching Model and Multi-Angle Tracking Algorithm for Loan Loss-Linking Customers Based on the Family Mobile Social-Contact Big Data Network. *Information Processing and Management*, 59(1): 102742.
- [4] Pang S., Wang J., Yi X. 2023. Application of Loan Lost-Linking Customer Path Correlated Index Model and Network Sorting Search Algorithm Based on Big Data Environment. *Neural Computing and Applications*, (35): 2129–2156.
- [5] Wang G. 2014. Establishing a Regular Verification System for Customer Contact Information. *Modern Finance Guide*, (04): 67.
- [6] Yang C. 2017. Research on the Risk Prevention and Control of College Campus Network Loans from the Perspective of Precise Financing. *Journal of Taishan University*, 39(05): 136-140.
- [7] Liao M. 2022. Research and Application of SCBTALL Algorithm and Loan Missing Customer Search Value Model Based on Information Heat Map. Jinan University. DOI: 10.27167/d.cnki.gjinu.2022.001441.
- [8] Pang S., Hou X. 2020. Calculating Method of Borrower's Credit Quality Transfer Probability and Application in Forecasting Loss-of-Connection Probability Based on TEL@Methodology. *Management Review*, 32(07): 267-279.
- [9] Li H., Zeng Y., Yu M., Zhao Q. 2021. A Method and System for Restoring Lost Customer Information. Patent CN112817993A.
- [10] Pang S., Yuan J. 2020. A Method for Circularly Searching for the Relationship between Criminals and Loan Defaulters Based on Mobile Social Networks. Patent CN111444437A.
- [11] Yan J., Wang K., Liu Y., Xu K., Kang L., Chen X., Zhu H. 2018. Mining Social Lending Motivations for Loan Project Recommendations. *Expert Systems with Applications*, 11: 100-106.