

Developing a Financing Model for Small and Medium-Sized Enterprises in Zanjan Province

Sheida Rezaei¹, Babak Haji Karimi ^{2,*}, Amir Najafi ³ and Bamdad Partovi ⁴



¹ Department of Management, Ab.C., Islamic Azad University, Abhar, Iran; 

² Department of Management, Ab.C., Islamic Azad university, Abhar, Iran; 

³ Department of Industrial Engineering, NT.C., Islamic Azad University, Tehran, Iran; 

⁴ Department of Economics, Ab.C., Islamic Azad University, Abhar, Iran; 

* Correspondence: Hajikarimi.b@abhariau.ac.ir

Abstract: The present study aimed to develop a financing model for small and medium-sized enterprises (SMEs) in Zanjan Province using a qualitative-quantitative mixed-methods approach. The qualitative phase involved experts, with a sample of 50 participants, and data were collected through interviews. In the quantitative phase, the statistical population comprised managers and experts working in SMEs in Zanjan Province; using Cochran's formula, the sample size was estimated at 284. A researcher-developed 64-item questionnaire was used after the qualitative phase. Face validity was used to assess the validity of the instrument, and Cronbach's alpha was used to assess reliability. Data were collected using stratified sampling and analyzed with SPSS and AMOS. Exploratory findings identified 10 factors related to SME financing. Confirmatory factor analysis indicated significant effects of the economic environment, government environment, modern financing methods, domestic financing, public participation, supportive policies, value creation, investment, foreign financing, and borrowing on SME financing. The Friedman ranking test further showed that foreign financing ranked first, with a mean rank of 9.30, whereas value creation had the lowest mean rank (2.98).

Keywords: Financing model; Small and medium-sized enterprises; SME financing; Zanjan; Structural equation modeling

1. Introduction

Small and medium-sized enterprises (SMEs) constitute a fundamental component of contemporary economic systems because of their contribution to entrepreneurship, employment generation, regional development, innovation, industrial diversification, and the creation of competitive markets. In both developed and emerging economies, SMEs frequently function as mechanisms through which entrepreneurial initiatives are transformed into productive activities, while their relatively flexible organizational structures allow them to respond more rapidly than large corporations to changing market conditions. Nevertheless, the ability of SMEs to survive, grow, invest, and innovate depends substantially on their access to

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appropriate financial resources. Financing is therefore not simply an operational issue but a strategic determinant of business continuity, competitiveness, and long-term development. Firms require financial resources to establish productive capacity, purchase equipment and technology, maintain working capital, enter new markets, finance innovation, and withstand temporary economic disruptions. The importance of this issue is especially pronounced among SMEs because their internal resources are generally limited and their access to formal capital markets is often considerably weaker than that of larger firms. Entrepreneurial financing consequently encompasses a diverse

set of internal and external mechanisms whose suitability depends on the characteristics of the enterprise, its developmental stage, available collateral, institutional conditions, and the broader financial environment [1]. The manuscript underlying the present study similarly conceptualizes financing as a persistent managerial concern involving the selection of appropriate financial instruments from multiple alternatives and emphasizes the need for a context-sensitive financing model for SMEs in Iran. Financing_Model_SMEs_Zanjan_Eng...

The financing problem of SMEs is multidimensional because these enterprises typically confront a combination of information asymmetry, insufficient collateral, limited credit histories, relatively high transaction costs, constrained bargaining power, and dependence on financial intermediaries. These difficulties may be intensified in environments characterized by macroeconomic instability, volatile interest and exchange rates, regulatory uncertainty, and underdeveloped capital markets. Evidence from different national settings shows that SME financing barriers are not reducible to a shortage of funds alone; rather, they emerge from interactions among enterprise characteristics, banking structures, public policies, credit-assessment systems, and institutional arrangements. Research on SMEs in Cameroon, for example, has demonstrated the persistence of financing challenges associated with formal financial institutions and difficulties in obtaining adequate external capital [2]. Similar concerns have been identified in Iran, where financing barriers affecting SME production include structural and institutional constraints that may prevent firms from obtaining resources on acceptable terms [3]. Such findings reinforce the proposition that effective SME financing cannot be explained solely through conventional debt-versus-equity choices; instead, analysis must incorporate a wider configuration of economic, governmental, organizational, and market-related conditions.

Financing decisions also involve determining the appropriate configuration of internal and external resources. Internal financing, including retained earnings and owners' contributions, offers enterprises greater autonomy and avoids some of the contractual burdens associated with external capital. Yet the internally generated funds of SMEs are often inadequate for financing expansion, modernization, or major technological investments. External financing can therefore become necessary as firms grow, although it exposes enterprises to interest costs, repayment obligations, collateral requirements, information disclosure, and greater dependence on creditors or investors. The choice among financing alternatives consequently requires systematic evaluation of risk, cost, accessibility, flexibility, maturity, and potential effects on ownership and control. Research using multicriteria decision-making approaches has shown that selecting the most appropriate financing method for SMEs requires simultaneous consideration of multiple financial and organizational criteria rather than reliance on a single indicator [4]. Similarly, contemporary reviews of SME financing emphasize that enterprises increasingly face a broad range of alternatives, extending beyond traditional bank loans toward leasing, factoring, venture capital, crowdfunding, alternative lending, and other market-based mechanisms [5]. This diversification increases potential financing opportunities while simultaneously making financing decisions more complex.

The life-cycle perspective offers an important framework for understanding this complexity. Financing requirements and feasible financing instruments generally change as enterprises move from establishment to growth, maturity, and possible restructuring. Early-stage SMEs frequently rely on owners, families, informal networks, and limited forms of credit because information asymmetry is high and verifiable financial histories are unavailable. Growing firms may progressively obtain bank credit, trade credit, venture capital, or other forms of external capital, while more mature enterprises may possess greater access to formal capital markets and sophisticated financial instruments. Accordingly, innovative financing instruments should be evaluated in relation to the developmental characteristics and life-cycle position of SMEs rather than treated as universally applicable

solutions [6]. Entrepreneurial finance can likewise include venture capital and angel investment, which may provide not merely financial resources but managerial knowledge, networks, monitoring, and strategic guidance. Recent evidence indicates that entrepreneurial financing, particularly venture capital and angel investment, may generate long-term effects extending beyond firm growth to employment creation and broader economic outcomes [7]. Thus, a comprehensive SME financing model should account for both traditional capital sources and emerging entrepreneurial financing mechanisms.

The capacity of firms to access and deploy capital efficiently is also related to financial flexibility. Financial flexibility refers to the ability of an enterprise to mobilize funds and adjust financing decisions when investment opportunities or adverse economic conditions arise. Firms with stronger financial flexibility can preserve borrowing capacity, maintain liquidity, and respond more effectively to unexpected financing requirements. Recent research has demonstrated a meaningful relationship between financial flexibility and corporate financing efficiency, suggesting that financing outcomes depend not only on the availability of financial resources but also on the firm's capacity to structure and manage those resources efficiently [8]. For SMEs, which commonly experience more severe liquidity constraints than large corporations, financial flexibility may be especially important. A financing arrangement that appears inexpensive under normal circumstances may become restrictive during periods of market instability, whereas diversified and flexible financing structures can reduce vulnerability to sudden interruptions in bank lending or internally generated cash flow.

Macroeconomic and policy conditions further shape the financing opportunities available to SMEs. Changes in monetary conditions, inflation, interest rates, exchange rates, government expenditure, banking regulations, taxation, and policy uncertainty can affect the willingness of financial institutions to lend and the willingness of enterprises to undertake investment. Economic policy uncertainty is particularly important because uncertainty can alter expectations regarding future revenues, financing costs, and investment returns. Evidence indicates that economic policy uncertainty can reduce corporate investment efficiency and that financing constraints play an important role in conditioning this relationship [9]. Financing constraints may likewise interact with managerial decision-making and technological innovation. Managerial short-termism can reduce investment in innovation, while financing constraints and environmental uncertainty may strengthen incentives for symbolic or strategically distorted corporate behavior rather than substantive long-term investment [10]. These findings demonstrate that financing cannot be adequately modeled without acknowledging the economic and institutional environment within which SMEs operate.

This consideration is particularly relevant to Iran, where SMEs operate under a distinctive combination of financial-market conditions, banking dependence, inflationary pressures, exchange-rate fluctuations, regulatory requirements, and limitations on access to certain international financial resources. The existing manuscript identifies restricted access to bank resources, exchange-rate changes, capital-intensive development needs, and other environmental pressures as factors that may weaken firms' financial positions and increase financial risk. It consequently emphasizes the need for a financing mechanism responsive to firm-level requirements and the surrounding economic environment. *Financing_Model_SMEs_Zanjan_Eng...* Research conducted within the Iranian context also confirms that financing methods can have important implications for corporate returns and performance, indicating that financing choices should be assessed not simply according to the amount of capital obtained but according to their consequences for firm-level outcomes [11]. For SMEs, inappropriate financing structures may create excessive debt-service burdens or liquidity pressure, whereas a more balanced financing structure can support investment and sustainable growth.

Another increasingly important dimension concerns digital transformation and information quality. Financing constraints frequently originate from information asymmetry between SMEs and capital providers. Because many SMEs possess limited public reporting histories, lenders and investors may face difficulty evaluating their creditworthiness and future prospects. Digitalization can potentially mitigate this problem by improving accounting systems, internal controls, information disclosure, transaction traceability, and the availability of real-time operational data. Evidence concerning corporate digital transformation indicates that digitalization can influence stock liquidity and that financing constraints, internal control, and information disclosure constitute important mechanisms in this relationship [12]. Although listed corporations differ from SMEs, the underlying logic is highly relevant: stronger digital information systems can reduce uncertainty for capital providers and improve financial transparency. Digital technologies can therefore become part of the institutional infrastructure of SME financing rather than merely tools for operational efficiency.

Blockchain technology illustrates this potential more specifically. Blockchain-based financing systems can increase transparency, create tamper-resistant transaction records, facilitate verification, and reduce some forms of information asymmetry between enterprises and financial intermediaries. In the context of small and medium-sized real-estate enterprises, a blockchain-driven framework has been proposed to strengthen financing credit mechanisms and improve the reliability of information used by financing institutions [13]. Blockchain has also been integrated into intelligent risk-management decision-support systems for supply-chain financing, allowing financial risks to be assessed through more structured and traceable information architectures [14]. For SMEs, such technologies may be especially useful when conventional financial statements provide insufficient information or where lenders perceive elevated monitoring costs. Consequently, modern financing methods should be understood not only as new sources of capital but also as institutional and technological innovations capable of changing the processes through which financing decisions are evaluated, approved, and monitored.

Sustainability considerations have similarly become integrated into corporate financing. Environmental, social, and governance (ESG) performance increasingly influences creditor and investor assessments because it can signal risk-management capability, governance quality, stakeholder relationships, and long-term organizational resilience. Empirical evidence suggests that favorable ESG performance can reduce debt financing costs through supply-chain-related channels [15]. ESG performance may also improve enterprises' access to commercial credit, indicating that sustainability practices can influence not only the price but also the availability of financing [16]. Within Iran, research has further examined the relationship between ESG performance and financing costs while highlighting the moderating role of green financing [17]. Although many SMEs may lack the formal ESG reporting systems of large corporations, the growing importance of environmental and social criteria suggests that sustainable business practices may increasingly affect their ability to establish financing relationships with banks, suppliers, investors, and institutional partners.

At the same time, not all viable financing arrangements depend on commercial banks, securities markets, or formal investors. Social capital and community-based financing constitute important alternative channels, particularly where formal financial markets remain inaccessible or insufficient. Social capital facilitates trust, reciprocal relationships, information exchange, and collective action, potentially reducing transaction costs and enabling enterprises or community organizations to mobilize resources through interpersonal and institutional networks. A recent bibliometric-systematic review demonstrates a growing intersection between social capital and community-based financing, suggesting that trust-based networks can constitute an important element of entrepreneurial resource mobilization [18]. This perspective is particularly relevant to SMEs because owner-

managers frequently maintain strong relationships with families, local communities, suppliers, customers, professional associations, and other enterprises. Such networks may provide direct financing, guarantees, trade credit, information, or access to formal lenders.

Faith-based and Islamic financing mechanisms provide another important pathway for financial resource mobilization in societies where financial decisions are shaped by religious, cultural, and institutional considerations. Qualitative evidence concerning faith-based financing and community mobilization demonstrates how collective commitment and locally embedded financing arrangements can support organizational sustainability when conventional funding mechanisms are constrained [19]. In the SME context, Islamic financing instruments can provide alternatives to conventional interest-based arrangements through mechanisms based on partnership, asset transactions, profit sharing, leasing, and other Sharia-compliant contractual forms. However, Iranian research has also emphasized the challenges associated with Islamic financing for SMEs and the need to develop practical solutions capable of improving access, reducing institutional barriers, and aligning financing instruments with the actual requirements of smaller firms [20]. These considerations suggest that financing models developed for Iranian SMEs should incorporate not merely imported financial instruments but also institutional arrangements compatible with the country's legal, banking, and socioeconomic environment.

The financing environment must therefore be considered as an ecosystem in which internal resources, bank borrowing, investment, governmental policies, modern financial technologies, community participation, and external sources interact. A narrow focus on a single source may overlook substitution and complementarity among financing mechanisms. For example, weak access to bank credit may increase reliance on retained earnings, trade credit, community networks, or alternative financing technologies; conversely, strong governmental guarantees may improve access to commercial lending. A firm's financing capacity can also shape its ability to generate value, introduce innovation, and undertake productive investment. Consequently, the relevant issue is not merely which financing method is theoretically superior but which configuration of financing sources and environmental conditions is most appropriate for a particular SME population.

These considerations become particularly significant at the regional level. National financing frameworks do not necessarily capture differences in industrial composition, access to financial institutions, local investment capacity, infrastructure, entrepreneurial networks, and administrative practices across provinces. Zanjan Province contains a substantial SME sector whose financing conditions need to be understood within its own institutional and economic setting. The underlying study focuses specifically on managers and specialists working in SMEs in Zanjan Province and seeks to construct a locally responsive model rather than apply an external financing framework without empirical adaptation. *Financing_Model_SMEs_Zanjan_Eng...* Such an approach is warranted because the effectiveness of financing instruments depends on the fit between enterprise characteristics and the surrounding ecosystem. International evidence on contemporary financing, digital technologies, entrepreneurial capital, community finance, and ESG-based credit mechanisms provides important conceptual guidance, but these mechanisms cannot automatically be assumed to have identical relevance in the Iranian provincial context.

Despite the expanding literature, several gaps therefore remain. Existing studies have often examined isolated aspects of SME financing, such as financing barriers [3], the choice among financing alternatives [4], Islamic finance [20], contemporary financing mechanisms [5], or digital and blockchain-based systems [13, 14]. Other studies have concentrated on broader corporate relationships involving financial flexibility, policy uncertainty, sustainability, and digital transformation [8, 9, 12]. Although these streams offer substantial insights, a need remains for integrated models that simultaneously account for conventional financing sources, alternative financing instruments,

investment conditions, governmental and economic environments, support mechanisms, public participation, and value-creation considerations. This gap is particularly important in regional SME populations where financing decisions are embedded within specific institutional and socioeconomic conditions.

Accordingly, developing an empirically grounded financing model can contribute to both theory and practice by clarifying the dimensions that shape SME financing and by indicating the relative importance of alternative mechanisms. Such a model can help managers evaluate financing options more systematically, assist financial institutions in designing products suited to SME characteristics, and inform policymakers regarding barriers and supportive interventions. It may also create a framework capable of accommodating emerging changes in entrepreneurial finance, including venture and angel investment [7], sustainability-oriented credit assessment [15, 16], community-based financing [18], and technology-enabled financing mechanisms. Furthermore, because SMEs often face stronger financing constraints than large firms, improving the structure through which financial resources are identified, accessed, and allocated may contribute directly to investment, innovation, employment, and regional economic development.

Therefore, the present study aimed to develop and empirically validate a comprehensive financing model for small and medium-sized enterprises in Zanjan Province by identifying, examining, and prioritizing the principal organizational, financial, economic, governmental, and alternative financing factors that shape SME access to financial resources.

2. Methods and Materials

Because the present research examines theoretical constructs in practical and real-world settings, it is applied in purpose. In terms of implementation, it is a survey study, and with regard to data analysis it is descriptive-correlational. The study population consisted of two groups: 50 experts and the managers and specialists of 1,098 small and medium-sized manufacturing units in Zanjan Province. In the first phase, experts were selected purposively. In the second phase, manufacturing firms were sampled proportionally from industrial zones; industries were grouped into zones, and the sample allocated to each zone was determined in proportion to the number of active firms. The research instrument in the first phase consisted of expert interviews administered in questionnaire form. In the subsequent phase, a structured questionnaire was used to collect data from SMEs. The exploratory questionnaire contained 64 items, and the confirmatory factor-analysis questionnaire used for model testing contained 52 items. Content validity was assessed using Lawshe's content-validity approach. Reliability was assessed through a pretest and Cronbach's alpha. After data collection, the findings were analyzed using SPSS version 24 and AMOS.

3. Findings and Results

To analyze the qualitative data and extract the categories required to answer the research questions, each interview was transcribed and initial concepts were identified. These initial concepts remained very close to the interviewees' statements and wording. During subsequent review, concepts directly related to financing were identified. The qualitative analysis followed seven steps based on Colaizzi's method.

Table 1. Factors and components extracted in relation to the first research question

No.	Factor	Indicators / components
1	Borrowing	Cash borrowing; Long-term loans; Short-term loans; Issuance of government bonds; Issuance of public bonds; Government bank; Cooperative fund

2	Foreign financing	Finance facilities; Refinancing; Secured credit sales; Purchase credit; Countertrade; Bonds (participation certificates); Borrowing from domestic banks (Islamic contracts); Accounts and notes payable; Advance receipts; Off-balance-sheet financing
3	Domestic financing	Increase in members' shares; Retained earnings; Changes in share value; Cash contributions; Reserves
4	Financing environment	Bank-loan growth rate; Bank loan-to-deposit rate; Number of financing institutions; Increase in the value of industrial financing
5	Investment	Personal capital; Merger of cooperatives; Establishment of a cooperative insurance company; Sale of shares; Attracting new members; Increase in reserve capital
6	Value creation	Idea generation; Education/training; Innovation; Technology
7	Supportive policies	Receipt of subsidies; Grants; Tax exemptions; Duties/levy exemptions; Export incentives
8	Public participation	Financing from friends and family; Financing from benefactors; Local associations; Start-up activities
9	Internal financing	Retained earnings; Dividends paid; Legal and precautionary reserves; Sale of assets; Loans received from partners; Partners' current accounts
10	Modern financing methods	Removal of legal restrictions; Reduction of bureaucracy; Influence of others; Reduction of collateral-related problems; Company relationships with other companies
11	Government environment	Amount of budget expenditures; Budget deficit-to-budget expenditure ratio; Budget deficit-to-budget revenue ratio; Administrative expenditure-to-budget revenue ratio
12	Economic environment	Gross domestic product; GDP per capita; Income generated by employees; Growth in secondary industrial income

Review of the interviews for the first research question yielded 12 categories: economic environment, government environment, modern financing methods, internal financing, public participation, supportive policies, value creation, investment, financing environment, domestic financing, foreign financing, and borrowing. A structured questionnaire was then designed on the basis of these categories and distributed among experts for exploratory factor analysis. The results of the exploratory factor analysis are presented below.

Exploratory factor analysis is the most common form of factor analysis and is used to identify the underlying structure of a relatively large set of variables. Its initial assumption is that each variable may be related to any factor (Garson, 2016).

Table 2. Rotated component matrix for questionnaire items

Item	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7	Factor 8	Factor 9	Factor 10
	Loading	Loading	Loading	Loading	Loading	Loading	Loading	Loading	Loading	Loading
Q1	0.682	0.211	0.297	0.152	0.234		0.354	0.293	0.234	0.167
Q2	0.560	0.415	0.104	0.114	0.205	0.211	0.402	0.349	0.326	0.129
Q3	0.583	0.345	0.130	0.307	0.201	0.172	0.165		0.181	
Q4	0.347	0.081	-0.112	0.371	0.142	0.402	0.330	0.405	0.104	0.293
Q5	0.401	0.322	-0.194	0.220	0.398	0.384	0.455	0.311	0.400	0.297
Q6	0.377	0.264	0.236	0.660	0.443	0.311	0.358	0.167		
Q7	0.400	0.219	0.407	0.588	0.402	0.340	0.427	0.326	0.129	0.347
Q8	0.449	0.400	0.248	0.670	0.356	0.167	0.401	0.326	0.296	0.370
Q9	0.425	0.319	0.197	0.715	0.453	0.211			0.313	0.166
Q10	0.282	0.285	0.202	0.529	0.243	0.366		0.129	0.293	0.434
Q11	0.380	0.142	0.354	0.648	0.348	0.411	0.412	0.349	0.383	
Q12	0.290	0.202	-0.145	-0.108	-0.109	0.389		0.297	0.101	0.200
Q13	0.589	0.365	0.148	0.346	0.134	0.237	0.471	0.166	0.255	0.478
Q14	0.621	-0.178	0.302	0.167	0.175	0.427	0.258	0.157	0.326	
Q15	0.525	0.150	-0.145	0.217	0.369	0.315	0.355	0.401	0.289	0.293
Q16	0.712	0.248	0.114		0.362	0.136	0.311	0.172		
Q17	0.123	0.235	-0.192	0.102	0.389	0.198	0.305	0.461	0.297	0.333

Q18	-0.208	0.692	-0.121	0.239	0.341	0.287	0.455	0.201	0.166	0.181
Q19	0.328	0.379	0.444	0.238	0.158	0.247	0.287	0.129	0.440	
Q20	0.175	0.297	0.149	0.124	0.269	0.328	0.141	0.100	0.478	0.326
Q21	0.108	0.593	-0.102	0.168	0.301	0.236	0.165		0.114	0.186
Q22	0.213	0.737	-0.111	0.185	0.307	0.245	0.204	0.326	0.293	0.167
Q23	-0.346	0.645	-0.387	0.356	0.181	0.227	0.092	0.130	0.383	0.495
Q24	0.135	0.457	0.478	0.251	0.106	0.269		0.309	0.296	0.355
Q25	0.166	0.687	0.415	0.166	0.356	0.264	0.326	0.376	0.104	0.311
Q26	0.235	0.592	0.220	0.409	0.145	0.214	0.166	0.423		
Q27	0.215	0.756	0.416	0.303	-0.190	0.351	0.293	0.276	0.293	0.234
Q28	0.459	0.281	0.244	0.160	-0.202	0.392	0.459	0.680	0.326	0.166
Q29	0.370	0.311	0.234	0.381	0.325	0.349	0.125	0.749	0.157	0.383
Q30	0.461	0.296	-0.249	0.418	0.366	0.178	0.129	0.608	0.347	0.111
Q31	0.147	0.243	-0.251	0.170	-0.169	0.130	0.349	0.526	0.297	
Q32	0.204	0.326	0.166	0.269	0.372	0.297	0.172	0.540	0.114	0.311
Q33	0.117	0.188	-0.137	0.180	0.296	0.125	0.326	0.315	0.349	0.129
Q34	0.487	0.225	0.311	0.114	0.116	0.167	0.234	0.519	0.313	
Q35	0.195	0.228	0.311	-0.153	0.383	0.469	0.157	0.459	0.104	0.326
Q36	0.383	0.458	0.409	0.266	0.129	0.459	0.181	0.370	0.166	0.499
Q37	0.306	0.470	0.404	0.306	0.149		0.326	0.186	0.129	0.171
Q38	-0.300	0.421	0.218	0.326	0.257	0.298	0.400	0.434		0.255
Q39	0.326	0.478	0.243	0.233	0.305	0.114	0.581		0.326	0.219
Q40	-0.110	0.291	0.187	0.297	0.218	0.401	0.666		0.293	
Q41	-0.181	0.318	0.224	0.457	0.412	0.293	0.670	0.326	0.114	0.383
Q42	0.459	0.213	0.293	0.339	0.324	0.465	0.729	0.100	0.125	
Q43	0.201	0.129	-0.129	0.279	0.181	0.349	0.469	0.478	0.200	0.561
Q44	0.283	0.478	0.125	0.130	0.244	0.315		0.311	0.108	0.526
Q45	0.169	0.326	0.326	0.121	-0.150	0.368	0.326	0.459	0.352	0.611
Q46	0.405	0.123	0.455	0.383	0.296	0.234	0.166	0.326	0.457	0.578
Q47	0.461	0.343	0.108	-0.301	0.392	0.440	0.347	0.167	0.698	0.302
Q48	0.297	0.225	0.318	0.326	0.104	0.157	0.377	0.130	0.769	0.129
Q49	0.138	0.293	0.422	0.444	-0.131	0.219	0.478	0.383	0.823	0.313
Q50	0.234	0.311	0.214	-0.173	0.326	0.333	0.405		0.528	0.311
Q51	0.104	0.207	0.297	-0.285	0.327	0.167	0.293	0.459	0.703	
Q52	0.132	0.187	0.114	-0.470	0.627	0.106		0.326	0.313	0.435
Q53	0.306	0.130	0.258	-0.172	0.714	0.157	0.181	0.370	0.297	0.369
Q54	0.136	0.114	0.401	0.326	0.546	0.459	0.166	0.114	0.326	0.212
Q55	0.315	0.129	0.388	0.459	0.649	0.125	0.434	0.466	0.440	0.383
Q56	0.444	0.326	0.563	0.480	0.166	0.412	0.311	0.478	0.104	0.315
Q57	0.478	0.157	0.742	0.383	0.201	0.461	0.293	0.333		0.108
Q58	0.167	0.125	0.684	0.401	0.234	0.326	0.297		0.326	0.129
Q59	0.166	0.311	0.656	0.405	0.478	0.326	0.326	0.130	0.125	
Q60	0.459	0.326	0.511	0.293	0.444	0.347	0.313	0.296	0.181	0.326
Q61	0.461	0.405	0.349	0.400	0.104	0.569	0.172	0.167	0.114	0.349
Q62	0.401	0.296	0.234	0.326	0.129	0.702	0.102	0.166	0.101	0.313
Q63	0.129	0.412	0.293	0.114	0.297	0.769	0.108	0.255	0.383	
Q64	0.181	0.478	0.480	0.166	0.186	0.823	0.222	0.349	0.326	0.401

Items were assigned to factors on the basis of their factor loadings in the Rotated Component Matrix. This matrix represents correlations between items and factors after rotation, with values ranging from -1 to +1. Each item was

allocated to the factor on which it had the largest loading, and factors were interpreted according to the items that loaded most strongly on them. The initial questionnaire contained 12 factors and 64 items. The exploratory analysis ultimately grouped the indicators into 10 principal factors, which together explained 78.238% of the total variance. After removing items with factor loadings below 0.50, 52 items remained.

Table 3. One-sample t-test results relative to the expected mean

Variable	t	df	Sig. (2-tailed)	Mean difference	95% CI		Expected mean
					Lower	Upper	
Domestic financing	-23.87	283	.000	-4.726	-5.117	-4.335	17.5
Investment	-6.41	283	.000	-1.428	-1.869	-0.990	15
Foreign financing	-0.08	283	.934	-0.024	-0.587	-0.539	17.5
Borrowing	-4.09	283	.000	-0.946	-1.403	-0.490	15
Economic environment	-2.353	283	.020	-0.423	-0.068	-0.777	10
Government environment	4.440	283	.000	0.851	0.473	1.230	10
Supportive policies	-4.970	283	.000	-1.369	-1.913	-0.825	12.5
Value creation	-1.246	283	.215	-0.268	-0.692	-0.157	10
Modern financing methods	-3.070	283	.002	-0.726	-1.193	-0.259	12.5
Public participation	-0.188	283	.851	-0.042	-0.480	-0.396	10

For domestic financing, the one-sample t test ($t = -23.87$, $p < .001$) showed a statistically significant difference between the observed and expected means. The observed mean (12.77) was below the expected value of 17.5; therefore, domestic financing was below the expected level among SMEs in Zanjan Province.

For investment, the one-sample t test ($t = -6.41$, $p < .001$) showed a statistically significant difference. The observed mean (13.57) was lower than the expected value of 15, indicating that investment was below the expected level.

For foreign financing, the one-sample t test ($t = -0.08$, $p = .934$) did not show a statistically significant difference. The observed mean (17.48) was slightly below the expected mean of 17.5.

For borrowing, the one-sample t test ($t = -4.09$, $p < .001$) indicated a statistically significant difference. The observed mean (14.05) was lower than the expected mean of 15, indicating a below-expected level of borrowing.

For the economic environment, the one-sample t test ($t = -2.353$, $p = .020$) indicated a statistically significant difference. The observed mean (10.42) was higher than the expected mean of 10.

For the government environment, the one-sample t test ($t = 4.440$, $p < .001$) indicated a statistically significant difference. The observed mean (10.85) was higher than the expected mean of 10.

For supportive policies, the one-sample t test ($t = -4.970$, $p < .001$) indicated a statistically significant difference. The observed mean (11.13) was lower than the expected mean of 12.5.

For value creation, the one-sample t test ($t = -1.246$, $p = .215$) did not indicate a statistically significant difference. The observed mean (9.73) was lower than the expected mean of 10.

For modern financing methods, the one-sample t test ($t = -3.070$, $p = .002$) indicated a statistically significant difference. The observed mean (11.77) was lower than the expected mean of 12.5.

For public participation, the one-sample t test ($t = -0.188$, $p = .851$) did not indicate a statistically significant difference. The observed mean (9.96) was slightly lower than the expected mean of 10.

In structural equation modeling, construct validity must first be evaluated to determine whether the selected indicators measure their intended constructs with adequate precision. Confirmatory factor analysis (CFA) was therefore conducted. The findings indicated an acceptable fit for all variables.

After verification of the measurement model and assessment of construct and discriminant validity, the relationships among the study constructs were tested. The proposed model was specified in AMOS and the causal relationships among variables were examined using structural equation modeling.

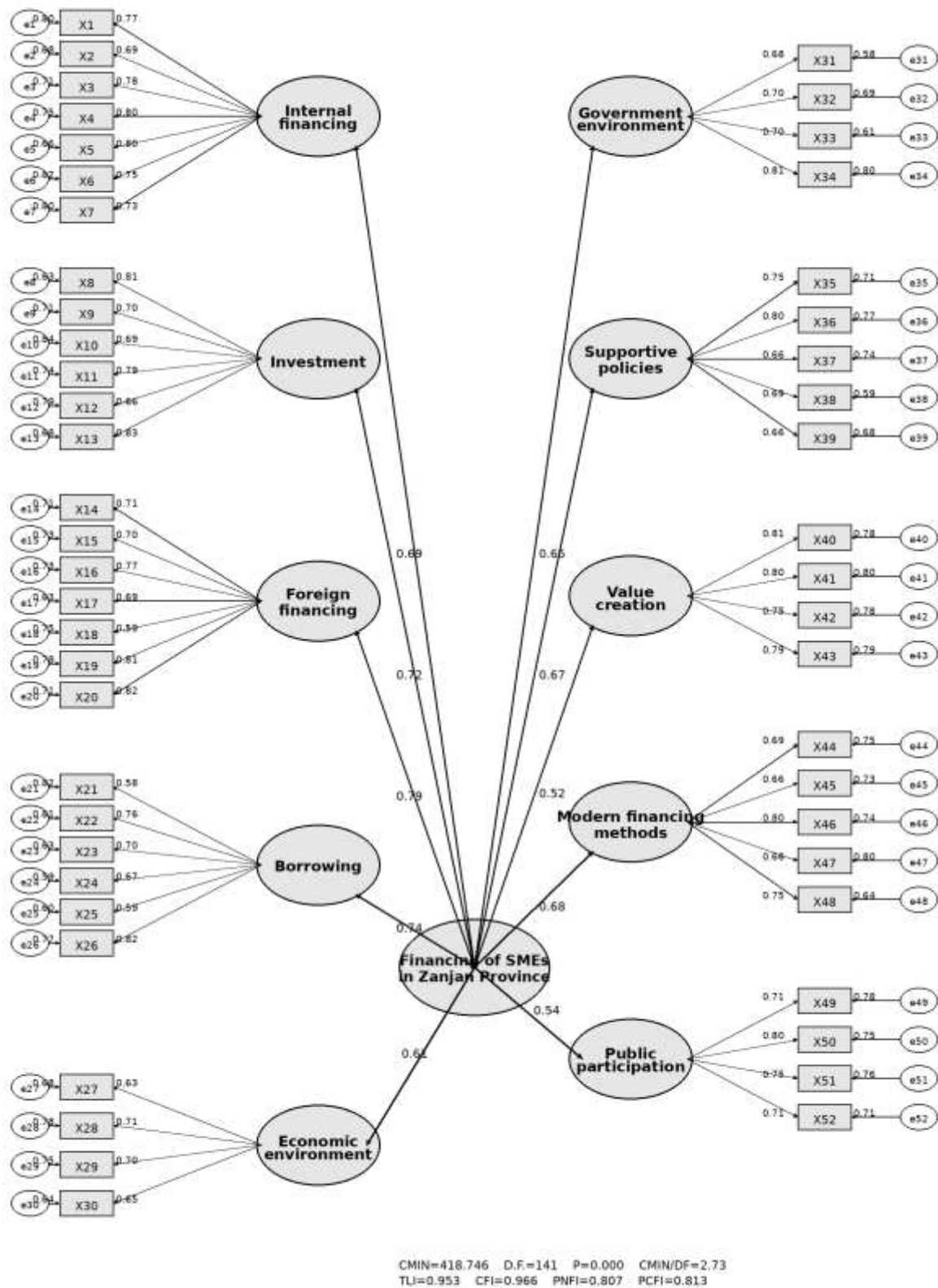


Figure 1. Structural model based on standardized coefficients

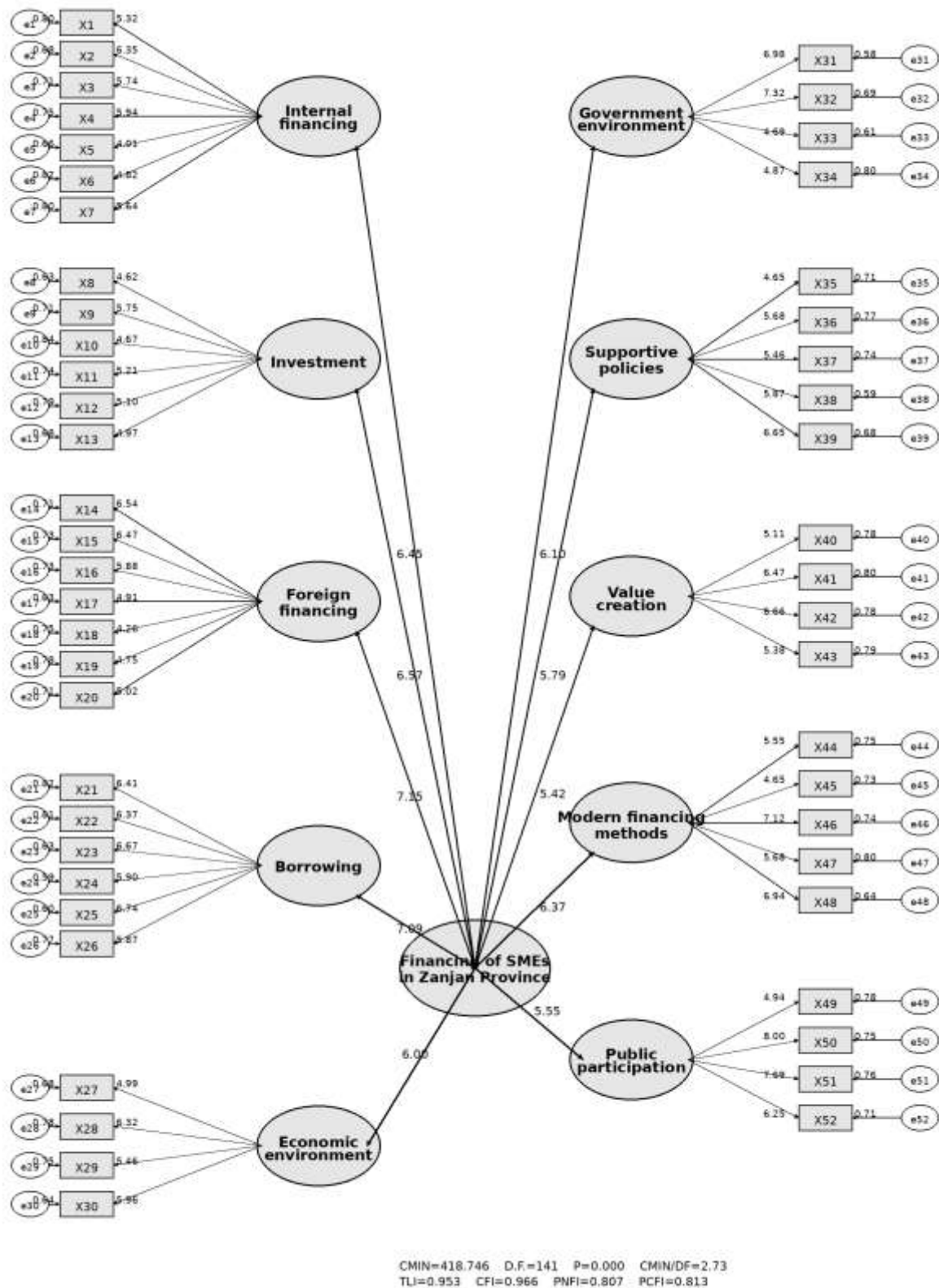


Figure 2. Structural model based on significance (t) coefficients

The RMSEA for the structural model was 0.045, which is below the conventional threshold of 0.08. Accordingly, no model modification was considered necessary for hypothesis testing, and the model demonstrated good fit. The

relative chi-square (CMIN/DF) was 2.73, the comparative fit index (CFI) was 0.966, TLI was 0.953, and the incremental indices were above 0.90. Together with an RMSEA of 0.045, these indices support the acceptability of the developed model.

Table 4. Summary of structural-model results

Variable	Effect	t statistic	Standardized effect
Domestic financing	Positive and significant	6.45	0.69
Investment	Positive and significant	6.57	0.72
Foreign financing	Positive and significant	7.15	0.79
Borrowing	Positive and significant	7.09	0.74
Economic environment	Positive and significant	6.00	0.61
Government environment	Positive and significant	6.10	0.65
Supportive policies	Positive and significant	5.79	0.67
Value creation	Positive and significant	5.42	0.52
Modern financing methods	Positive and significant	6.37	0.68
Public participation	Positive and significant	5.55	0.54

The t statistic for domestic financing was 6.45, which lies outside the non-significant range of -1.96 to +1.96. Therefore, domestic financing had a statistically significant effect on the financing of SMEs in Zanjan Province.

The t statistic for investment was 6.57, which lies outside the non-significant range of -1.96 to +1.96. Therefore, investment had a statistically significant effect on the financing of SMEs in Zanjan Province.

The t statistic for foreign financing was 7.15, which lies outside the non-significant range of -1.96 to +1.96. Therefore, foreign financing had a statistically significant effect on the financing of SMEs in Zanjan Province.

The t statistic for borrowing was 7.09, which lies outside the non-significant range of -1.96 to +1.96. Therefore, borrowing had a statistically significant effect on the financing of SMEs in Zanjan Province.

The t statistic for economic environment was 6.00, which lies outside the non-significant range of -1.96 to +1.96. Therefore, economic environment had a statistically significant effect on the financing of SMEs in Zanjan Province.

The t statistic for government environment was 6.10, which lies outside the non-significant range of -1.96 to +1.96. Therefore, government environment had a statistically significant effect on the financing of SMEs in Zanjan Province.

The t statistic for supportive policies was 5.79, which lies outside the non-significant range of -1.96 to +1.96. Therefore, supportive policies had a statistically significant effect on the financing of SMEs in Zanjan Province.

The t statistic for value creation was 5.42, which lies outside the non-significant range of -1.96 to +1.96. Therefore, value creation had a statistically significant effect on the financing of SMEs in Zanjan Province.

The t statistic for modern financing methods was 6.37, which lies outside the non-significant range of -1.96 to +1.96. Therefore, modern financing methods had a statistically significant effect on the financing of SMEs in Zanjan Province.

The t statistic for public participation was 5.55, which lies outside the non-significant range of -1.96 to +1.96. Therefore, public participation had a statistically significant effect on the financing of SMEs in Zanjan Province.

Table 5. Ranking of factors affecting SME financing

Rank	Variable	Mean rank
1	Foreign financing	9.30
2	Borrowing	7.49
3	Domestic financing	7.06
4	Investment	6.44

5	Modern financing methods	5.32
6	Supportive policies	4.57
7	Government environment	4.46
8	Economic environment	4.03
9	Public participation	3.34
10	Value creation	2.98

The Friedman ranking test showed that foreign financing ranked first among the financing variables for SMEs in Zanjan Province, with a mean rank of 9.30. Borrowing ranked second (7.49), domestic financing third (7.06), investment fourth (6.44), modern financing methods fifth (5.32), supportive policies sixth (4.57), government environment seventh (4.46), economic environment eighth (4.03), public participation ninth (3.34), and value creation tenth (2.98).

4. Discussion and Conclusion

The present study developed and empirically validated a multidimensional financing model for small and medium-sized enterprises (SMEs) in Zanjan Province. The exploratory analysis reduced the initial structure to 10 principal financing factors represented by 52 indicators, with the retained factors accounting for 78.238% of the total variance. These factors were domestic financing, investment, foreign financing, borrowing, economic environment, government environment, supportive policies, value creation, modern financing methods, and public participation. The confirmatory and structural analyses further demonstrated that all 10 dimensions had positive and statistically significant effects on SME financing. Model-fit indices indicated an acceptable structural model, including $CMIN/DF = 2.73$, $CFI = .966$, $TLI = .953$, and $RMSEA = .045$. Financing_Model_SMEs_Zanjan_Eng... Collectively, these findings indicate that SME financing in Zanjan Province cannot be adequately explained through a single financing channel, such as bank borrowing or retained earnings. Rather, financing appears to be a systemic phenomenon influenced simultaneously by firm-level resources, external capital, public policy, macroeconomic conditions, participation mechanisms, and emerging financing instruments. This multidimensional interpretation is consistent with contemporary literature emphasizing the increasingly diversified structure of SME finance and the need to select financing instruments according to firm characteristics, institutional environments, and developmental needs [1, 5].

Among all factors, foreign financing demonstrated the strongest standardized effect on SME financing ($\beta = .79$), followed by borrowing ($\beta = .74$), investment ($\beta = .72$), domestic financing ($\beta = .69$), modern financing methods ($\beta = .68$), supportive policies ($\beta = .67$), government environment ($\beta = .65$), economic environment ($\beta = .61$), public participation ($\beta = .54$), and value creation ($\beta = .52$). Financing_Model_SMEs_Zanjan_Eng... The strong effect of foreign financing indicates that SMEs perceive access to external sources beyond their immediate internal financial base as particularly important for maintaining and expanding productive activity. This finding is understandable because SMEs often possess insufficient retained earnings and owners' capital to finance investment, technological upgrading, working-capital requirements, or expansion. Entrepreneurial financing research similarly emphasizes that external financial resources become increasingly important as firms move beyond the start-up phase and face larger capital requirements [1]. Moreover, evidence concerning venture capital and angel investment indicates that external entrepreneurial financing can have long-term consequences for business development and employment creation [7]. Therefore, the strong role observed for foreign financing may reflect the broader need of SMEs to diversify their capital base beyond internally generated resources and conventional local financing channels.

Foreign financing also received the highest position in the Friedman ranking, with a mean rank of 9.30, substantially higher than the other financing dimensions. Borrowing ranked second at 7.49, domestic financing third at 7.06, and investment fourth at 6.44. Modern financing methods ranked fifth at 5.32, followed by supportive policies at 4.57, government environment at 4.46, economic environment at 4.03, public participation at 3.34, and value creation at 2.98. Financing_Model_SMEs_Zanjan_Eng... The prominence of external and debt-related channels suggests that managers and specialists in Zanjan SMEs regard access to capital itself as an immediate strategic concern. This finding corresponds with evidence from developing economies showing that SMEs commonly experience substantial financing gaps and difficulties in accessing formal financial markets [2]. Research in Iran has likewise identified financial, institutional, and administrative barriers as important obstacles to SME production and development [3]. When internally available funds are inadequate, firms become more dependent on external resources, which can explain the high rankings assigned to foreign financing, borrowing, and domestic financing in the present model.

Borrowing produced the second strongest standardized effect ($\beta = .74$) and ranked second in relative importance. This result highlights the continued centrality of debt financing to SMEs, particularly in economic environments in which capital markets and equity-based mechanisms are less accessible to smaller firms. Debt allows firms to obtain resources without diluting ownership, but its usefulness depends on interest rates, collateral requirements, repayment conditions, credit availability, and financial stability. The present finding aligns with research showing that contemporary SME financing still relies strongly on debt even as alternative mechanisms expand [5]. However, dependence on borrowing may also increase financial vulnerability where enterprises face volatile revenues or economic uncertainty. Wang and Zhu demonstrated that financing constraints interact with economic policy uncertainty in shaping corporate investment efficiency, indicating that access to financial resources and the broader policy environment jointly determine whether enterprises can transform financing into productive investment [9]. The strong role of borrowing identified in this study should therefore not be interpreted as evidence that greater debt is invariably desirable; rather, it demonstrates the importance of accessible and appropriately structured credit within the SME financing ecosystem.

Investment also demonstrated a comparatively strong effect ($\beta = .72$), suggesting that capital formation and the availability of investment resources constitute major determinants of SME financing. Investment financing is essential because SMEs need capital not merely to survive but to acquire technologies, develop products, increase productive capacity, improve quality, and enter new markets. Long-term entrepreneurial financing may be particularly important where innovative projects require resources that cannot be repaid immediately from current revenues. The positive importance of investment is consistent with evidence that venture capital and angel investment may produce enduring effects on business expansion and job creation [7]. It is also compatible with research on financial flexibility, which indicates that firms capable of securing and reallocating financial resources efficiently are better positioned to respond to investment opportunities [8]. For SMEs in Zanjan Province, strengthening investment channels could therefore improve not only liquidity but also strategic capacity for longer-term growth.

Domestic financing had a significant effect of $\beta = .69$ and ranked third in the Friedman analysis. However, the one-sample t-test indicated that its observed mean was significantly below the expected level, suggesting that although domestic financing is highly relevant to SME financing, its existing availability or utilization remains inadequate. Financing_Model_SMEs_Zanjan_Eng... This apparent discrepancy is important: a factor may be structurally important while simultaneously being insufficiently developed in practice. Iranian research has

similarly indicated that different financing methods exert meaningful effects on corporate returns and performance, emphasizing the importance of matching financing structures to organizational requirements [11]. Research on financing-method selection also supports a multicriteria perspective, showing that SMEs must evaluate available sources in relation to cost, accessibility, risk, and strategic suitability [4]. Thus, the present findings suggest that improving domestic financing does not merely require increasing the nominal supply of funds; financing instruments must also become more accessible, affordable, and compatible with the characteristics of SMEs.

Modern financing methods also had a substantial positive effect ($\beta = .68$), although their observed level was significantly below the expected benchmark. This result points to an important development gap between the potential importance of innovative financing mechanisms and their current level of institutionalization among SMEs in Zanjan Province. Contemporary SME financing increasingly includes alternatives such as venture financing, crowdfunding, supply-chain finance, digital lending, and technology-enabled credit systems [5, 6]. Blockchain technology may further facilitate SME financing by improving transparency, transaction traceability, information reliability, and credit assessment. Lin proposed a blockchain-based framework for financing credit in small and medium-sized enterprises, emphasizing its capacity to improve the informational basis of financing relationships [13]. Similarly, blockchain-supported risk-management systems have been proposed for supply-chain financing to improve financial risk identification and decision support [14]. The present finding therefore suggests that improving digital and institutional infrastructure could help SMEs access financing mechanisms that extend beyond traditional bank-centered arrangements.

Supportive policies had a significant effect of $\beta = .67$, while their observed level was significantly below the expected value. This indicates that subsidies, grants, taxation arrangements, exemptions, export incentives, guarantees, and related policy instruments may materially shape SME financing, yet existing support may be perceived as insufficient. Policy support is particularly important for SMEs because smaller enterprises may face disadvantages in collateral, information disclosure, bargaining power, and financing history. The significance of supportive policies is consistent with research showing that financing barriers are partly institutional rather than purely firm-specific [3]. Moreover, uncertainty in government economic policy can reduce investment efficiency, especially where financing constraints are substantial [9]. Thus, stable and predictable policies can influence financing indirectly by lowering uncertainty as well as directly through incentives and financial-support programs.

The government environment and economic environment also exerted significant positive effects, with standardized coefficients of .65 and .61, respectively. Importantly, the government environment was above its expected mean, whereas the economic environment was also reported above the expected value in the study's descriptive interpretation. *Financing_Model_SMEs_Zanjan_Eng...* These findings reinforce the view that SME financing is embedded in a broader institutional context. Government budgets, administrative systems, taxation, regulatory procedures, monetary conditions, inflation, and economic growth can change both the supply and cost of financing. Economic and environmental uncertainty can intensify financing constraints and alter corporate investment and innovation decisions [9, 10]. Accordingly, financing policy cannot be designed independently from macroeconomic stabilization and regulatory reform. Even well-designed lending programs may fail to generate sustainable outcomes if firms simultaneously face unpredictable costs, unstable markets, administrative barriers, or high uncertainty.

Public participation had a statistically significant structural effect ($\beta = .54$), although it ranked ninth and did not differ significantly from the expected level in the one-sample test. The role of public participation is theoretically meaningful because financing from families, local communities, benefactors, associations, and entrepreneurial

networks may supplement formal sources when SMEs experience restrictions in banking or capital markets. Recent scholarship has increasingly emphasized social capital as a mechanism through which entrepreneurs mobilize community-based financial resources [18]. Trust, reciprocal relationships, and network embeddedness can lower information barriers and facilitate access to resources that may not be available through formal lenders. Faith-based financing provides another illustration of how community relationships can support organizational sustainability through collective resource mobilization [19]. In Iran, Islamic financing mechanisms may further provide alternative channels that are compatible with prevailing financial and institutional principles, although challenges remain in adapting such instruments effectively to SME needs [20]. Therefore, the comparatively lower ranking of public participation should not be interpreted as irrelevance; rather, this mechanism may remain underdeveloped compared with conventional financing channels.

Value creation showed the smallest standardized coefficient ($\beta = .52$) and ranked last, with a mean rank of 2.98. Nevertheless, its effect remained statistically significant, demonstrating that activities such as innovation, technology adoption, education, and idea generation retain an important role in the financing model. The relatively low ranking may reflect managers' prioritization of immediate access to capital over intangible capabilities whose financial effects become visible over longer periods. Yet financing and value creation are mutually reinforcing. Firms require capital to innovate and digitalize, while firms that demonstrate innovation capacity, transparency, and strategic quality may become more attractive to creditors and investors. Evidence concerning digital transformation shows that financing constraints, internal control, and information disclosure are closely connected to the financial consequences of corporate digitalization [12]. Likewise, ESG performance can improve access to commercial credit and reduce debt financing costs by signaling lower risk and stronger stakeholder management [15, 16]. Iranian evidence further suggests that green financing can alter the relationship between ESG performance and financing costs [17]. Therefore, value creation may have been ranked relatively low in immediate financing decisions while still serving as an important long-term mechanism for improving financeability.

Overall, the findings support an integrated financing perspective in which SMEs require a portfolio of complementary financing sources rather than reliance on a single mechanism. Foreign financing, borrowing, domestic financing, and investment represent the strongest immediate dimensions, whereas modern financing methods and supportive policies provide institutional mechanisms capable of broadening financial access. Government and economic conditions define the external environment within which these financing choices become feasible, while public participation and value creation provide supplementary and longer-term capabilities. This integrated structure is consistent with contemporary scholarship showing that SME financing now includes conventional debt, entrepreneurial investment, alternative financial instruments, digital technologies, community-based finance, and sustainability-related credit mechanisms [1, 6, 18]. The principal contribution of the present study is therefore its demonstration that financing challenges among SMEs in Zanjan Province should be addressed through a multidimensional ecosystem rather than through isolated credit interventions.

The study has several limitations that should be considered when interpreting its findings. First, the quantitative phase was restricted to managers and specialists of SMEs operating in Zanjan Province, and regional characteristics regarding industrial composition, access to financial institutions, administrative practices, and economic conditions may limit the generalizability of the resulting model to other Iranian provinces or national contexts. Second, the study relied largely on self-reported assessments obtained from experts and SME managers, which may be influenced by subjective perceptions, recall error, or socially desirable responses. Third, the cross-sectional nature of the quantitative data does not permit examination of how financing priorities change over time or in response

to major macroeconomic shocks. Fourth, although the model incorporated 10 broad dimensions, other potentially relevant variables—such as firm age, firm size, ownership structure, profitability, collateral quality, financial literacy, export orientation, sector, digital maturity, and managerial risk preferences—were not explicitly modeled as moderators or control variables. Finally, the ranking of financing factors reflects respondents' assessments of relative importance and should not necessarily be interpreted as evidence that the highest-ranked mechanism produces the greatest causal improvement in actual firm performance.

Future studies should test the proposed model using larger samples drawn from multiple provinces and economic sectors in order to assess its external validity and determine whether the relative importance of financing dimensions differs across geographical and industrial contexts. Longitudinal designs would be particularly valuable for examining how financing patterns respond to changes in inflation, interest rates, exchange-rate conditions, banking policy, and business-cycle fluctuations. Researchers may also extend the model by incorporating firm-level characteristics such as age, size, profitability, leverage, export activity, ownership structure, collateral capacity, and technological intensity as moderators. Comparative studies could examine differences between manufacturing and service SMEs, start-ups and mature enterprises, or high-technology and traditional businesses. Future research should also examine specific modern financing mechanisms—including crowdfunding, venture capital, supply-chain finance, fintech lending, blockchain-based credit, and green financing—as distinct constructs rather than aggregating them within a general dimension. Testing the model through longitudinal structural equation modeling, multigroup analysis, or mixed-method comparative designs could further clarify causal pathways and identify heterogeneous financing needs among different categories of SMEs.

For practice, SME managers should adopt diversified financing strategies that balance internal resources, borrowing, domestic and external financing, and investment capital rather than relying excessively on a single source. Financial institutions should design credit products appropriate to SME cash-flow structures, reduce unnecessary collateral and documentation burdens, strengthen credit-assessment systems, and accelerate financing procedures. Government agencies can improve access to finance by expanding credit guarantees, targeted subsidies, tax incentives, export-support programs, and transparent financing schemes while reducing administrative complexity. Policymakers should also encourage fintech platforms, supply-chain financing, digital credit systems, and other innovative mechanisms capable of reducing information asymmetry and transaction costs. SME managers should strengthen accounting transparency, internal controls, digital information systems, innovation capability, and strategic financial planning to improve their creditworthiness. Finally, mechanisms for attracting investors, mobilizing community resources, developing cooperative financing networks, and linking SMEs with domestic and international capital providers should be strengthened so that firms can obtain financial resources appropriate to their stage of development, risk profile, and investment objectives.

Authors' Contributions

Authors equally contributed to this article.

Ethical Considerations

All procedures performed in this study were under the ethical standards.

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Conflict of Interest

The authors report no conflict of interest.

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