



The predictors of social capital in agricultural consultation, technical, and engineering service companies

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ABSTRACT

Social capital is an essential type of capital that influences the growth and development of societies. The present descriptive-survey research aimed to capture CEOs' social capital predictors in the agricultural consultation, technical, and engineering service companies in Fars province, Iran. The CEOs, who amounted to 107 people, all participated in the research. The data collection instrument was a questionnaire whose content and face validity were confirmed by a panel of experts and whose reliability was calculated by Cronbach's alpha at 0.82. Data were analyzed in the SPSS22 software package. Based on data analysis, eight social capital items were derived and prioritized. They included social participation, social proactivity, social trust, neighborhood connections, friends and family connections, capacity to accept differences, appreciation of life, and work connections. Based on the ranking of these elements, social proactivity, work connections, and friends and family connections were ranked first to third, respectively. Also, step-by-step multiple regression analysis revealed that the three variables of the feeling of job security, investment, and media were the independent variables that accounted for the CEO's social capital. Programs provided by the media should focus on promoting people's social solidarity. Some investment must be made by these companies in social activities and encouragement of the target community's participation and trust. The success of the agricultural consultation, technical, and engineering service companies is based on the principles of specialty, trust, participation, and social solidarity, showing the existence of social capital in these companies. Therefore, social capital and factors that predict it influence the productivity and efficiency of the companies.

1. Introduction

The transition from subsistence agriculture to commercial agriculture [1] has increased the intricacies of farm management, while the increasing growth of agricultural technologies and emerging phenomena like climate change have created a need for more farm management skills [2,3,4]. The public extension service that usually provides farmers with free services has failed to respond to this

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need [5,6,7]. According to Ref. [8], public extension systems are traditional, obsolete, centralized, patriarchal, rigid, and enclosed in administrative bureaucracy, so they have failed to adapt to the dynamic demands of modern commercial agriculture. Now, extension-consultation services are not provided to farmers only by the government, but a wide range of individual and collective actors, including farmer cooperatives and associations, multinational agricultural production or processing companies, and private-sector extension and consultation companies, are involved in this activity [9,10].

Given the long history of private sector-based approaches in agricultural extension and consultation services, the extension services provided by private institutions are a fundamental part of the emerging systems of pluralistic and demand-based extension in developing countries [11,12,1]. A combination of the supply of extension services by public and private sectors not only covers various farmer groups (smallholders and plantation owners) more extensively but also allows farmers to choose consultation services provided by different extension service-providing institutions based on their production goals [13,14,15,16].

Privatized agricultural extension or agricultural advisory services across the world have a very diversified range of goals, such as improving rural livelihood, improving natural resource management, building social capital, empowering farmers, and enhancing national food security [17]. The success or failure of these services depends on various factors. Farmers' engagement with the advisory systems is commonly viewed through an economic lens. In this conceptualization, farmers' willingness and ability to pay for advisory services is used to consider policies for funding advisory and extension services [18]. Regarding this view, farmers with higher income and purchasing power have access to extension services [19,20]. But, using a social lens, especially in developing countries, and accepting and applying recommendations presented by privatized extension companies depend on social relations between service providers and users.

Despite the relatively rich literature on the concept of social capital, there is no consensus on the meaning of this concept, and new dimensions are progressively considered in efforts to measure it. In one sense, social capital is the collective asset or social-institutional resources of the structural relationships between people in society [21] that enhances social organization characteristics like trust, norms, and networks to increase the efficiency of society by facilitating coordination actions. Indeed, social capital is social norms and trust that enable people to act collectively [22]. In this regard [23], defines social capital as features of social life – e.g., networks, norms, and trust – that enable people to pursue their common goals by cooperating with others [24]. states that social capital is emphasized by promoting self-dependency capabilities in society by reducing government power and motivating voluntary and social activities. This method seems specifically appropriate for people with lower and poorer resources to accumulate resources. According to Ref. [25], social capital has two dimensions: cognitive and structural. The cognitive dimension includes norms, values, attitudes, and beliefs, and the structural dimension encompasses networks and institutions that link people and groups to do collective actions [26]. divides social capital into bonding and bridging. Bonding social capital refers to interactions between similar people (like relatives and close friends), but bridging social capital refers to interactions between dissimilar people (like people in different socioeconomic conditions) [24]. lists three types of social capital: bonding (strong local network communications), bridging (relatively weak but comprehensive communications), and linking (weak and transaction-based communications with externals).

Most studies on social capital in agriculture have found that social capital is an important factor in behavioral decisions. For instance, some researchers have discussed the impact of social capital on farmers' decisions, such as adopting new agricultural technologies [27,24]. According to these researchers, structural and cognitive social capital can significantly affect farmers' willingness and promote them to adopt new technologies. In this regard [28], highlighted some aspects of social capital, such as social networks, trust, and participation.

The other research area related to social capital in agriculture has focused on the role of social capital in developing agricultural non-governmental organizations and cooperatives, especially in developing countries. The structural social capital can form the three types of relationships that farmers would establish among themselves within their organizations (bonding relations), between their organizations and others of the same kind (bridging relations), and with other powerful and influencing actors (linking relations) [29]. Also, strengthening social capital may result in enhancing organizational transparency, collaborative work, social networks, and cooperative resilience [30].

Despite notable works on social capital among farmers, few studies have emphasized the role and significance of the conceptual dimensions of social capital in agricultural extension services. In addition to the competencies of the members and managers of agricultural organizations like agricultural extension services (e.g., creativity, leadership, task-fulfilling ability, decision-making ability, human ethics, judgment ability, insightfulness, public relations, and ability to coordinate), constructive interaction with farmers as the main stakeholders of agricultural and rural development is unquestionably the major path to the success of these organizations in achieving their goals [31]. In this regard, some scholars argue that social capital can influence various aspects of organizations and companies, including efficiency [32], achievement of vision goals [33], knowledge of communities, economic development, political capacity [34], entrepreneurship [35], and innovation adoption [36]. It can, therefore, be concluded that social capital is a decisive factor in the success of non-governmental and cooperative organizations [37]. In other words, social capital is regarded as an invaluable resource with collective ownership that refers to the features of social organizations, such as networks, norms, and trusts, which are highly influential in facilitating cooperation and coordination to gain mutual profit. So, the coordination and cooperation of managers are expected to be higher with other members and the target group (farmers) in companies with higher social capital [38,39]. Also, the richer the people's social capital, the higher their health and security [40,41].

The agricultural extension system in Iran, which has been centralized in the governmental structure of the Ministry of Agriculture since its establishment, has been burdened by a shortage of extension agents, agents' low practical knowledge and skills, and the inability to secure funding in recent decades [42,43]. In this regard, the privatization of agricultural extension was operationalized in 2002 by initiating the Wheat Supervisor Engineers Company project, which aimed to recruit agriculture graduates at different levels for farm consultation. Along with the evolution of the project, agricultural extension, technical, and engineering services companies

composed of these graduates have started to emerge throughout Iran since 2007 [44]. According to this project, graduates of different agriculture disciplines have founded and launched these companies. Agricultural consultation, technical, and engineering companies aim to accelerate the transfer of scientific and research findings to the agricultural sector, enhance farmers' knowledge and skills, improve the production efficiency of the farming units qualitatively and quantitatively, increase farmers' revenues and living levels, and commercialize production through reforms in the production management system.

Since these companies started their activity, they have been subject to various efforts for efficiency assessment [45,46,44,47,48,49]. The results show that despite their relative success [50,51], their performance has not been as satisfactory as expected [45]. [47] ascribed their failure to achieve their goals to structural, environmental, psychological, skill, and educational shortages. However, their under-optimal performance has also been influenced by several external factors, such as the lower tendency of farmers, especially smallholders and poor farmers, to pay for consultation services, the low financial support of the companies, inadequate support by supervising governmental institutions, and non-economical income of these companies due to the low tariffs of private extension services [52,53,48].

Some studies have emphasized the role and significance of the conceptual dimensions of social capital in the success of private agricultural extension services in Iran. For example [54], reported that three dimensions of social capital, including structural, cognitive, and communicational dimensions, influenced organizational entrepreneurship development in these companies in the southern counties of Kerman province. Also [55], found that social support development, convergence, and bilateral interactions of companies with farmers were effective in their success in entrepreneurship development.

A factor that must be considered regarding the development and stability of agricultural consultation, technical, and engineering service companies is efforts to improve service effectiveness. On the other hand, farmers' expectations from these companies can be categorized into three categories: educational, behavioral, and technical. A key factor in encouraging experts and farmers' participation in extension activities is companies' CEOs. As the leader of consultation and technical activities, CEOs play an essential role in investment, cooperation of experts and farmers, and experts' risk-taking. In other words, if CEOs come to an understanding of the significance of social capital in the company, they will take advantage of all factors to promote social capital so that experts can transfer knowledge to farmers in the best possible way. So, the importance of attention to the managers of these companies is self-evident.

Despite the assertive role of social capital in the development and success of non-governmental agricultural organizations and companies that are in direct contact with farmers, few studies have addressed it. Various researchers in Iran have mentioned the loss of social capital as a primary challenge of the country [54,55,56]. So, it seems necessary more than ever to determine and measure the factors that can promote social capital in privatized agricultural services. Thus, this research aimed to explain and analyze the social capital of agricultural consultation, technical, and engineering service companies as the main program of privatized agricultural services in Fars province, Iran. The achievement of this general goal could be possible by achieving two specific goals: (i) studying the demographic characteristics of the managers in terms of age, educational level, the area of the land covered by the company, and employment or non-employment in a second job, and (ii) accounting for and analyzing the components of the managers' social capital and determining their social capital in agricultural consultation, technical, and engineering service companies.

This study is structured as follows. First, we review the existing literature concerning privatized agricultural extension services and the role of social capital within the agricultural sector. We then analyze the components of the managers' social capital and the effects of main variables in predicting social capital. Finally, we summarize the conclusions of our analysis, drawing practical and theoretical implications for the future of agricultural consultation, technical, and engineering service companies and highlighting areas in which more empirical research is needed.

2. Literature review and theoretical framework

Numerous studies have dealt with the dependence and influence of social capital on organizational and social contexts. Researchers have always been interested in subjects like how social capital is fostered, what factors reinforce or weaken it, what consequences it has, and how it is affected by other individual and collective human behavior parameters. Regarding the factors constituting or fostering social capital, example studies are those conducted by Refs. [57,23,58,59] who found that mass media can promote social capital if employed correctly. Also [60], reported that family income, income level, education, age, family size, and mutual trust of the parties had a direct relationship with social capital [61]. argue that practical compliance of public managers with outstanding traits like social responsibility and solidarity with society and their adherence to moral principles can contribute to creating social capital and an atmosphere of confidence and trust among citizens [62]. state that managers should be careful not to blemish people's reputations and should not forget justice in their actions, even for 1 s. It can, therefore, be said that the manager's adherence to high human qualities like benevolence, philanthropy, and justice can increase people's and even clients' trust, effectively strengthening social capital. This claim can be found in Ref. [62]'s study that found a positive and significant relationship between people's perceived justice in the organization and the organization's social capital. In other words, the formation of social capital is severely affected by perceived justice in the organization. Despite the relatively rich literature on social capital in organizational studies, the lack of consensus on its meaning and subparts has led to contradictory or different results and interpretations.

On the other hand, some researchers suggest that social capital has collective benefits for human communities. For example [63], argues that just as social capital can help cope with poverty and vulnerability, it can make people more tolerant of risks. In other words, it can increase their risk-taking [64,65]. perceive social capital as a phenomenon composed of trust (norms), common values and behaviors, communications, cooperation, mutual commitment, mutual recognition, and networks, which contribute to achieving mutual benefits. Noting the fast-paced developments in the contemporary world and the need for utilizing new methods and paradigms to gain new competitive advantages [66,20], regard social capital as the core of management in organizations because, as they argues,

social capital can prevent the waste of other forms of capitals, e.g., economic, physical, and human capital. Other researchers have also revealed the positive and constructive effect of social capital on human capital development. An example is [67]’s research. They conclude that social capital is significantly influential in human resource development, so increasing social capital results in raising human capital, or the so-called labor quality. On the other hand, social capital affects people’s intentions and motivation for cooperation positively [68,69]. [70] states that social capital is a sort of resource that is controlled by people and organizations and is regarded by them to be important. According to them, social capital remarkably affects human resource efficiency and productivity, and two of its critical consequences are people’s involvement in knowledge and innovation and the improvement of product quality. Therefore, the governance of social capital in organizational relations leads to organizational synergy on the one hand and the acceleration of achieving organizational goals on the other. In this regard [71], also emphasizes the value of social capital as a source. They argue that people’s understanding of one another increases their efficiency and effectiveness in the organization. Similarly [72], concluded that there was a significant relationship between social capital and job activities.

Some research has focused on the status of social capital among rural people and farmers and its significance in adopting agricultural innovations or adapting to environmental changes. These studies have mostly confirmed the role of this component in agriculture development. For instance Ref. [73], studied the effect of understanding environmental regulations on farmers’ adoption of green agricultural production technologies and found that understanding environmental regulations and social capital had a significant interactive effect on farmers’ adoption. At the same time, social capital could strengthen the impact of understanding environmental regulations on adopting green production technology. In a study on the importance of various types of social capital, including building, bridging, and linking in accepting changes in the UK agricultural policy [74], reported that ordinary farmers who had never participated in agricultural-environmental projects and those who had recently been involved in current environmental projects exhibited high levels of bonding capital and low levels of bridging and linking, which may hinder their ability to adapt to changes [75]. found that social capital was an effective factor in the participation of water users in the management and use of irrigation and drainage networks [76,77]. similarly regard social capital as a critical social aspect of villages, which helps their development. Indeed, social capital is known as a valuable resource in tackling some problems of agricultural cooperatives [78,79].

Regarding the significance of social capital in the agricultural sector and rural development management issues, we can recite the results of [80] about triggering development in the management of the agricultural sector through developing and reinforcing non-governmental organizations and associations. Their results show that the more organized the farmers of the agricultural sector are, the greater the responsiveness, transparency, efficiency, effectiveness, and finally productivity of this sector will be. They emphasize social capital as a factor that can facilitate this trend and solve current issues and problems. Also, research shows that social capital plays a role in forming and reinforcing agricultural production cooperatives. For example [75], found that farmers who adopted water user associations had higher trust, solidarity, and social cooperation than non-adopter farmers. In another research, they put social trust in the list of the success factors of rural cooperatives [25]. In a study on production cooperatives [81], also showed that the social capital of the members of these cooperatives played a positive role in better decision-making, better and more optimal production management, and greater motivation and cooperation in production. Likewise, in their study on the social capital components of members and non-members of rural production cooperatives [82], found that information sharing with outside the social system, trust in inputs, the network of formal relations, and awareness were the most important factors distinguishing these two groups, respectively [73]. reported that social-supportive factors, discipline, job factors, risk-taking, managerial-organizational factors, the flexibility of regulations, the elimination of bureaucracy, and information technology were effective in creating and preserving social capital.

Research on the significance and effectiveness of social capital components in agricultural consultation service companies has been rare. Most literature on social capital in the agricultural sector has focused on performing farmers’ collective action through cooperatives. So, it can be inferred that privatized agricultural services have been neglected by researchers who work in this research field. However, some researchers have recently shown interest and focused on social capital in privatized services. For example, in a study on agricultural consultation, technical, and engineering service companies [83], concluded that social capital, economic, personal, structural, environmental, and socio-cultural status, and investment rate were the factors determining the viability of these companies. Also [25], argues that social capital is directly involved in reinforcing and developing intellectual capital in these companies.

It can be inferred from the literature review that various factors can account for social capital in agricultural consultation, technical, and engineering companies. Some of these factors are related to people’s psychological attributes because social capital is partially related to people’s mental-psychological issues. So, the two components of risk-taking and motivation can be considered in this regard.

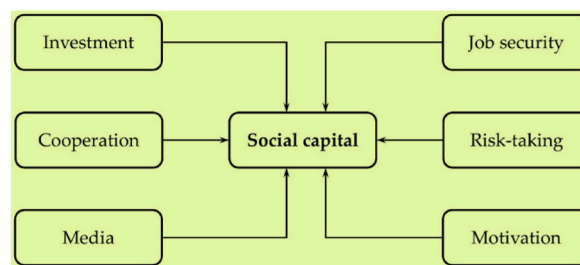


Fig. 1. The conceptual framework of the research.

On the other hand, there are some factors outside the individual which are considered external elements. For example, using media as a socio-cultural instrument can reinforce the social capital of people and institutions. Economic issues can also influence people's social capital. The type, extent, and manner of a CEO's investment can not only influence social capital but also unlock people's potential trust and cooperation. Accordingly, the conceptual framework of the research was developed, as displayed in Fig. 1.

3. Methodology

This research is a quantitative study in terms of methodology and an applied study in terms of goal, which was conducted as a descriptive study. The cross-sectional survey method was used for data collection. The statistical population was composed of all CEOs of the agricultural consultation, technical, and engineering companies in Fars province (N = 107), who participated in the research by the census method.

The agricultural sector of Fars province has played a major role in the production, employment, and food security of Iran. Also, it has a significant share of the gross national product. So far, about 9% of the added value of the agricultural sector of Iran (first place) is in the province of Fars, and 23% of the workers in the province are active in the agricultural sector. Fars province has been ranked third in annual cultivars in the country and second in permanent crops. Regarding the production of horticultural and crop products, Fars province has a special place. Indeed, about 16 % of Iran's horticultural crops are produced in this province, which is ranked first in this regard. It is also ranked second in crop production, accounting for about 9 % of all crops produced in Iran.

The data collection instrument was a questionnaire whose questions were organized into three sections. Section 1 was related to demographic and professional characteristics. Sections 2 and 3 included questions to measure the amount of social capital and independent variables (three items for investment, three items for cooperation, four items for media, three items for job security, five items for risk-taking, and five items for motivation), respectively. The components of social capital in this research included participation in the local community (4 items), proactivity in a social context (3 items), social trust (4 items), neighborhood connections (3 items), friends and family connections (4 items), capacity to accept differences (3 items), appreciation of life (4 items), and work connections (5 items). The variables were all calculated on a five-point scale from 1 for "very low" to 5 for "very high." The basis was [26]'s questionnaire with an interval scale, which was adjusted and tailored to the CEOs' attributes. The face and content validity of the questionnaire was confirmed by some managers of different agricultural organizations in Fars province and some faculty members. They first studied the questions and items thoroughly and proposed their revisions. Then, they were interviewed face-to-face to discuss their perspectives and apply the required revisions. The reliability of the questionnaire was estimated by Cronbach's alpha, for which 30 questionnaires were filled out by a part of the statistical population, and after data processing, Cronbach's alpha was estimated for the items and questions at 0.82. The questionnaires were filled out at the managers' office of the agricultural consultation, technical, and engineering service companies, taking 20–25 min.

Data were analyzed in the SPSS22 software package using the statistics of frequency, percentage, mean, and standard deviation (SD) in the descriptive section and multiple regression in the inferential section to account for the social capital of the CEOs of the agricultural consultation, technical, and engineering service companies in Fars province.

Table 1
The demographic characteristics of the respondents.

Variable	Strata	Frequency	Percent	Cumulative percent
Age (years)	20–30	60	58.3	58.3
	30–40	38	36.9	95.2
	40–50	5	4.6	100
Field of study	Agricultural extension and education	26	24.3	–
	Agriculture	34	33	–
	Animal husbandry	21	20.4	–
	Plant protection	15	14.6	–
	Machinery	8	7.8	–
Job experience (years)	1–5	59	57.3	57.3
	5–10	23	22.3	79.6
	10–15	18	17.5	97.1
	15–20	3	2.9	100
Second job	Yes	42	40.8	–
	No	65	59.2	–
Number of company members	5–10	21	19.4	19.4
	10–15	49	44.7	64.1
	15–20	37	34	98.1
	20–25	2	1.9	100
Area of land supervised (ha)	<100	1	1	1
	100–500	27	24.3	25.3
	500–1000	40	36.9	62.2
	1000–1500	11	9.7	71.9
	1500–2000	2	1.9	73.8
	>2000	1	1	74.8
	Unreported	26	25.2	100

4. Results

4.1. CEOs' demographics

According to Table 1, 34 participants (33 %) were graduates of agriculture, 26 people (24.3 %) were graduates of agriculture extension and education, 21 (20.4 %) were graduates of animal husbandry, 15 (14.6 %) were graduates of plant protection, and 8 (7.8 %) were graduates of agricultural machinery. Also, 60 CEOs (58.3 %) were in the age range of 20–30 years, and the remaining were in the age ranges of 30–40 years (38 CEOs, or 36.9 %) and 40–50 years (5 CEOs, or 4.6 %). Therefore, over 50% of the managers were composed of educated youth. In terms of job experience, 50 CEOs (57.3 %) had a job experience of 1–5 years, while it was 5–10 years for 23 participants (22.3 %), 10–15 years for 18 participants (17.5 %), and 15–20 years for three participants (2.9 %). On the other hand, 42 CEOs (40.8 %) expressed that they had a second job in addition to the management of the company. According to the participants, 19.4% of the companies had 5-10 members, 44.7 % had 10-15 members, 34% had 15-20 members, and 1.9% had 20-25 members. In terms of the area of land supervised by the company, it was 500–1000 ha for 36.9% of the companies, 100–500 ha for 24.3% of the companies, 1000–1500 ha for 9.7% of the companies, 1500–2000 for 1.9% of the companies, >2000 ha for only one percent of the companies, and <100 ha for again only one percent of the companies.

4.2. Components influencing CEOs' social capital

This section explores six components influencing social capital (the feeling of job security, investment, cooperation, risk-taking, motivation, and media). Table 2 presents that most CEOs (41.7 %) highly trusted their staff. The frequency distribution of the variable of the investment by the agricultural consultation, technical, and engineering companies indicated that investment had been made in agriculture heavily by 40 CEOs (38.8 %) and very heavily by 35 CEOs (34 %). The frequency distribution of cooperation with the extension agents of the Agriculture Organization showed that most CEOs (43.7 %) cooperated with them to a great extent. Also, 38.8% of the CEOs estimated the risk-taking of the members of their companies at a high level. A variable underpinning social capital was the motivation of the company to get involved in economic activity. It was found that 34 CEOs (33 %) expressed the high motivation of their companies for these activities. The frequency distribution of the variable of using mass media showed that 36 CEOs (35 %) expressed their extensive use of mass media.

4.3. Prioritization of the eight components of social capital

Hypotheses 1. The five components of social capital have suitable priorities.

In this section, the eight components of social components were prioritized as (i) social participation, (ii) social proactivity, (iii) social trust, (iv) neighborhood connections, (v) friends and family connections, (vi) capacity to accept differences, (vii) appreciation of life, and (viii) job connections. The components of social proactivity, work connections, and friends and family connections were ranked the highest with means of 3.875, 3.365, and 3.365 and SDs of 0.746, 0.652, and 0.652, respectively. The component of neighborhood connections was ranked the lowest, with a mean of 3.177 and an SD of 0.655 (Table 3). Fig. 2 is presented to better illustrate this ranking.

4.4. The effect of the independent variables in the prediction of social capital

Hypothesis 2. The independent variables are stronger predictors of CEOs' social capital.

Table 4 presents the results of multiple regression, especially regression coefficients and the constant. As is evident, out of the six components that were considered to influence the social capital of the agricultural consultation, technical, and engineering service companies, the three components of the feeling of job security, media, and investment were included in the regression model as they were found to be significant. In other words, these three variables had a significant linear relationship with the dependent variable, i.e., social capital. The β -coefficients of these independent variables reveal that the variable of job security is the most influential as social capital changes by 0.289 units for one unit of change in this component. Also, one unit of change in the components of investment and media was found to change social capital by 0.305 and 0.12 units, respectively.

Table 2

The frequency distribution of the components affecting social capital.

Variable	Very low		Low		Relatively		High		Very high	
	Frequency	%	Frequency	%	Frequency	%	Frequency	%	Frequency	%
Feeling of job security	0	0	6	5.8	16	15.5	43	41.7	38	36.9
Investment	0	0	7	6.8	21	20.4	40	38.8	35	34
Cooperation	2	1.9	6	5.8	23	22.3	45	43.7	27	26.2
Risk-taking	1	1	13	12.6	16	15.5	40	38.8	33	32
Motivation	6	5.8	17	16.5	15	14.6	34	33	31	30.1
Mass media	7	6.8	17	16.5	16	15.5	26	25.2	36	35

Table 3
Ranking of the eight components of social capital.

Item	Mean	SD	Rank
Social proactivity	3.875	0.746	1
Work connections	3.365	0.652	2
Friends and family connections	3.365	0.652	3
Social participation	3.310	0.641	4
Social trust	3.310	0.641	5
Appreciation of life	3.303	0.638	6
Capacity to accept differences	3.245	0.751	7
Neighborhood connections	3.177	0.655	8

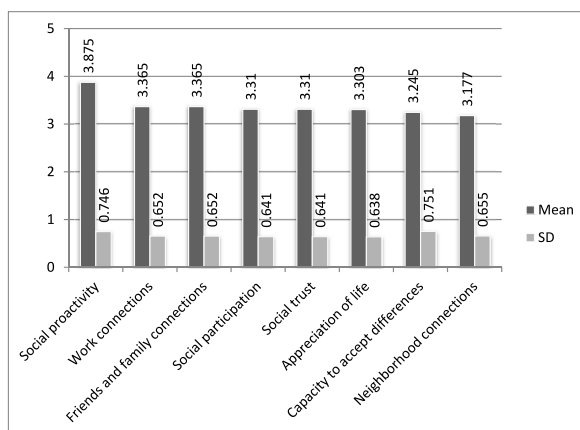


Fig. 2. The ranking of the eight components of social capital.

Table 4
The application of multiple regression in determining the independent variables influencing CEOs' social capital.

Model	Unstandardized coefficients		Standardized coefficient	t	Sig.
	B	Error SD	β		
Constant	23.843	2.418	–	9.862	0.000
Feeling of job security (x1)	0.980	0.317	0.289	3.090	0.003
Investment (x2)	0.994	0.313	0.305	3.179	0.002
Cooperation (x3)	–0.019	0.293	–0.006	–0.065	0.948
Risk (x4)	0.395	0.281	0.138	1.407	0.163
Motivation (x5)	0.111	0.247	0.046	0.448	0.655
Media (x6)	0.272	0.224	0.120	1.213	0.039

According to R^2 , the three variables included in the regression equation together predicted 38% of the variance in the variable of the social capital of the agricultural consultation, technical, and engineering companies. Also, the three independent variables of the feeling of job security, investment, and media accounted for 28, 6.2, and 3.8% of the variance in social capital, respectively. As is evident, the feeling of job security has the greatest share in capturing this variance (Table 5).

Finally, based on the final model of the multivariate regression, social capital in the agricultural consultation, technical, and engineering companies can be estimated by the following equation:

$$Y = a + b_1x_1 + b_2x_2 + b_3x_3$$

$$Y = 23.843 + 0.98x_1 + 0.994x_2 + 0.272x_3$$

Table 5
The variance in social capital accounted for by the independent variables.

Variable	R	R ²	R ² change
Feeling of job security	0.529	0.28	0.28
Investment	0.584	0.342	0.062
Media	0.616	0.38	0.038

in which x_1 , x_2 , and x_3 represent the feeling of job security, investment, and media, respectively.

5. Discussion

The results show that the distribution of the study fields is symmetrical in the agricultural consultation, technical, and engineering companies, so graduates of all agriculture-related fields work in most companies. In addition, most experts and CEOs have second jobs, implying that they cannot make a living only by relying on the company. There is empathy among company members, so 77% of the CEOs trust their colleagues. This is in agreement with the results of [73]. Also, 70% of the CEOs have close relationships with the experts and staff of the Agriculture Organization, which facilitates information sharing between these two structural institutions. Risk-taking is high among 69% of the CEOs. So, they participate in new occupations and situations, which, in turn, enhances their social capital. This is consistent with the report of [63]. Based on the results, 60% of the CEOs use mass media. The use of mass media increases social capital, as argued by Refs. [23,58,59]. Social capital is perceived as more important when one considers its increasing role in improving human interactions, such as improving trust and people's cooperation, which accelerates performing the tasks. This can be well supported by a review of the literature. However, the other extreme, i.e., the severe deficiency or lack of social capital, must not be neglected as it can deter human communities.

According to the results, 78% of the studied companies have 10–20 members, and 72% of CEOs have invested in agriculture. This implies that they are at a good level of income. Company size and income have direct relationships with social capital, so social capital increases as they increase. This has been confirmed by Ref. [60]. In the present work, it was found that the variable of the feeling of job security had the greatest role in accounting for the social capital of the CEOs in Fars province. This variable has been emphasized as one basis of social capital in various references. Our finding agrees with several studies, such as [61,66].

The ranking of the eight components of social capital among the CEOs shows that work connections and proactivity in the social context were higher than the other components. However, neighborhood connections were estimated at a low level. This reflects the high collectivist morale among the CEOs, which can contribute to the success of agricultural associations and cooperatives.

The regression analysis of the social capital predictor variables reveals that the variables of the feeling of job security, investment, and mass media are significantly involved in increasing or decreasing social capital. Indeed, 38% of social capital is predicted by these three variables. In other words, economic constructs and media play a fundamental role in the social capital of agricultural consultation, technical, and engineering service companies. Some scholars [62,74,78] have also emphasized the role of these variables in developing strategies.

6. Conclusion

As was already mentioned, social capital in various fields has been considered by researchers, such as the research on social capital and mass media [84,85,86], social capital and the internet [23], social capital and innovation [36], social capital and poverty in rural areas and social capital and its difference between rural and urban areas [58]. However, a few studies have addressed the concept of social capital in the agricultural sector, especially in the context of private-sector extension services, such as agricultural consultation and technical service companies. Even though recent research has shown that social capital, besides financial, physical, and human capital, explains the success or failure of private-sector extension services, a few studies have focused on the status of social capital in these businesses.

By emphasizing the importance of reinforcing social capital in the performance of these companies, the present research aimed to check the status of different dimensions of social capital at the level of these companies from the perspective of their CEOs in the first place and identify the factors influencing the social capital of these companies including psychological attributes, social factors, media, and economic constructs in the second place.

The first research question was about the status of the social capital components of the CEOs. A descriptive analysis of social capital among the CEOs showed that the status of three components, including social participation, social proactivity, and social trust, were better than the other components. However, mutual respect and trust between farmers and the CEOs still need to be improved. In fact, the CEOs, besides their financial and physical capital, should invest in their social capital because their existence and survival depend on the demand of their users (farmers). So, it can be concluded that the more the attention and investment in social capital, the more successful the CEOs.

The second research question that the research aimed to answer was how the social capital of CEOs can be strengthened. The regression analysis showed that psychological factors like security sense, economic factors like the amount of investment in social capital, and applying mass media to promote and strengthen social capital, could be useful. So, CEOs should attend to such factors to increase their social capital.

Since some studies introduced different components of social capital, future studies can investigate the other components of social capital, such as social networks and social solidarity. Also, cultural factors and moral values should be investigated as potential predictors of social capital components. Finally, the status of social capital in different private extension agents can be addressed because of the pluralistic feature of privatized agricultural extension services.

7. Theoretical implications

Most studies on social capital have focused on its three famous dimensions, including trust, network, and norm [87]. But, this

research studied eight dimensions of social capital, including social participation, social proactivity, social trust, neighborhood connections, friends and family connections, capacity to accept differences, appreciation of life, and work connections. In this respect, the network dimension corresponds to work connections, family relations, and neighborhood connections [88]. But, as the results showed, they were not all at the same level, and neighborhood connections were at the lowest level of social capital. So, the view on the detailed dimensions of social capital provided more precise results than the holistic view on its famous dimensions.

The dimensions of social proactivity, appreciation of life, and capacity to accept differences, which were used to measure social capital in this research, have been considered in a few studies. As the results showed, social proactivity had the highest level of social capital, reflecting its significance in measuring social capital. Also, the capacity to accept differences is an important component in forming and strengthening social capital and facilitating social actions, so researchers must consider it.

Whether social capital is merely influenced by psychological traits or other factors, such as economic and external factors, is a big question. This research used a combination of psychological constructs (e.g., risk-taking and motivation), social factors (e.g., cooperation), the activity of external institutions (e.g., media), and economic constructs (e.g., investment and the feeling of job security) to predict the eight dimensions of social capital. Based on the results, economic factors and media play a decisive role in reinforcing social capital.

8. Practical implications

Private-sector agricultural extension and consultation services regard knowledge as an invaluable commodity and perceive that it is necessary to spend money to access it. Since the formation of private-sector extension institutions in developing countries, their adoption by farmers, especially smallholders and poor farmers who are accustomed to free-of-charge public-sector extension services, has always been a concern for the policymakers and planners of the agricultural sector. Demand orientation, which is inherent to private-sector extension units like agricultural consultation, technical, and engineering service companies, depends on the social capital of these units. By experience, companies that have more social capital due to their performance are more trusted and referred by more farmers, which is a win-win game for the companies and farmers.

Based on the results, agricultural consultation, technical, and engineering service companies should make long-term plans to strengthen social capital dimensions, including networks, trust, and participation. These companies' investment in enhancing their social capital will determine how much the farmers will cooperate with them and will guarantee their success.

Also, these companies must consider the factors influencing the formation and endurance of their social capital, such as psychological factors, economic factors, and media, in their strategic programs. In this regard, an important role of mass media is to increase the participation and social interaction of people with one another. So, programs offered in media should enhance social solidarity.

These companies must invest in social activities and encourage the target community's participation and trust. However, social capital, which is a factor in the productivity of physical and human assets, has no place in the studied agricultural community, and its enhancement is a priority for the success of agricultural development programs. Authorities and developers must focus on planning and implementing plans to develop social capital in the target community. Indeed, the present world is a world of competition, and any corporation whose behavior and attitude are oriented toward provoking its clients' trust and participation will have greater social capital and will win the competition with its competitors.

Informed consent obtained for research

All participants provided written informed consent prior to engagement in the study.

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Data availability statement

Data will be made available on request.

CRediT authorship contribution statement

Pouria Ataei: Writing – original draft, Supervision, Data curation, Conceptualization. **Afshin Mottaghi Dastenaie:** Writing – review & editing, Supervision, Methodology. **Nasim Izadi:** Writing – review & editing, Software, Methodology, Formal analysis. **Hamid Karimi:** Writing – review & editing, Supervision, Resources, Formal analysis. **Meysam Menatizadeh:** Writing – original draft, Validation, Methodology, Formal analysis.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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