

*What connections in networks
of private entrepreneurs
are related to growth?*



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What connections in networks of private entrepreneurs are related to growth?

Abstract: The purpose of this paper is to present the connections in private networks of entrepreneurs that are related to growth in turnover. This will be illustrated through the study of growth patterns in three Danish food networks containing 93 SMEs. The research question is explored through a quantitative study that employs statistics and causal path modelling on the impact of connections among physical, social and economical spaces on growth. The main findings indicate that growth is embedded in entrepreneurial networks and is significantly dependent on the number of connections in physical space as well as on the heterogeneity of the value chain. Connections in the social space have a high degree of co-variance with the physical space but indirectly have a negative impact on growth. The implications of these findings explain the need for greater emphasis on physical connections and for further exploration of the impact of heterogeneous value chain activities on growth for entrepreneurial networking firms in rural areas.

Keywords: Growth, connections, physical space, social space, economical space

¿Qué conexiones en las redes de empresarios privados están relacionadas con el crecimiento?

Resumen: La intención de este trabajo es presentar las conexiones en redes privadas de empresarios que están relacionadas con el aumento de las ventas. Se ilustrará mediante el estudio de los modelos de crecimiento en tres redes que agrupan a 93 pequeñas medianas empresas alimentarias. La pregunta central de la investigación se intenta responder a través de un estudio cuantitativo que utiliza estadísticas y modelos causales de trayectoria sobre el impacto que las conexiones entre espacios físicos, sociales y económicos pueden ejercer sobre el crecimiento. Los resultados principales indican que el crecimiento está insertado en redes empresariales y depende en gran medida del número de conexiones en el espacio físico, así como de la heterogeneidad de la cadena de valor. Las conexiones en el espacio social tienen un alto grado de covarianza con el espacio físico pero indirectamente tienen un impacto negativo sobre el crecimiento. Las implicaciones de estos resultados explican la necesidad de un mayor hincapié en las conexiones físicas, y de una exploración a largo plazo del impacto de las actividades heterogéneas de las cadenas de valor sobre el crecimiento, para las redes empresariales en áreas rurales.

Palabras clave: Crecimiento, conexiones, espacio físico, espacio social, espacio económico

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Introduction

Forming organised networks is considered one of the ten most important dimensions of systemic innovation and growth, as shown by Edquist (2004) and Asheim and Coenen (2005). According to their research, the network approach at the regional level provides an interesting platform for knowledge sharing among stakeholders because it provides opportunities for utilising and combining explicit and implicit knowledge (Nonaka and Takeuchi, 1995). Furthermore, a trans-sectoral economic cooperation is created that, by taking advantage of the heterogeneous knowledge of the stakeholders, can create new values. Thus, based on this research, connections in economic space are expected to have a positive impact on growth.

At the societal level, connections can be described in spaces. These theoretical considerations are based on Castell's theory (Castell 1996; 2003) of spaces and the physics and flow among those spaces. The theory is based on the premise that the individual exists in different spaces simultaneously, and those spaces co-exist sometimes overlapping or being embedded within another space. The discussion on the space of flow includes the following three dimensions: social/cultural flow, physical flow and economic flow. The economic flow can be explained through an examination of systems that emphasise the entire value system from the beginning, which involves the development of the products and/or services, to the end, which includes use or delivery of the products and/or services to the end user. Firms fit into this value

system by establishing their own position on the value chain, thus providing value to the system. The theoretical thinking regarding spaces of flow suggests that social, physical and economical connections are required to support and promote innovation and economic development in rural areas. To analyse this theory a research was conducted in a rural network context. The research dealt with the question of what impact social, physical and economic connections have on growth in turnover in private entrepreneurial food networks in Denmark.

The rural food networking firms target innovation and growth in their networking activities. It is important to analyse the firms within these networks in regards to their connections and the small and medium sized enterprises – called SMEs'- current growth rates as well as their projected growth rates. These conditions are especially relevant in the context of the financial crisis because this crisis challenges growth expectations and reveals the dedication of private entrepreneurs to growth.

The financial crisis began in the fall of 2008 and quickly became noticeable in many firms. The data for this study were gathered between April and May of 2009. During this time, almost every industry was entrenched in the financial crisis and fully aware of its impact on their businesses. This situation provides a good opportunity to examine the growth and the impact on growth expectations in the context of the rural food network. This paper is not based on an analysis of the network as an economic unity because the network is loosely coupled and, thereby, does not represent a traditional enterprise for growth. Because the networking firms provide food production and food service activities, the growth in turnover is embedded in the participating entrepreneurial firms within the network. The network itself has no formal joint production and/or combined services programs, but the network members strive for "cooperation within the networks for business development and sustainable growth for their own firms" as described on the website of the networks. Because of the rather loose structure of the networks, data for the analyses are obtained at the firm level.

The outline of the paper is as follows. First, a literature review is presented and hypotheses are developed. Data are then collected, research methods are described and variables for the testing of the hypotheses are constructed. Hypotheses are tested through a structural equation modelling to reveal the impact of various connections on growth. The findings are discussed and summarised for policy implications, and future research possibilities are identified in the conclusion.

Literature Review

Network theory denotes the opportunities for networking participants to create value through their networking activities. The premise is that participants, who engage in networking through an often loosely coupled system of networks, have easy access to necessary resources that they may not otherwise have access to. This creates a competitive advantage, as noted by Burt (2000). If three or more firms cooperate or collaborate, they often form either a formal or an informal network. In the scholarly literature, a distinction is made between social networks, as first discussed by Granovetter (1973), and innovation networks, as first presented by DeBression and Amesse (1991). This paper will focus on the innovation networks and on the networks of firms. Hage and Alter (1997) have revealed how networks of firms differ from other types of networks and alliances. The four distinctions identified by Hage and Alter are briefly stated as follows:

- A more complex coordination of tasks
- A system of networks that span industrial sectors
- Firms that may be involved in more than one network
- Network memberships that are more diverse with a variety of involved functions.

As a result of these distinctions, firm networks are essentially structural holes, according to Burt (2000). Based on the distinctions, firm networks are described as complex organisations that span many sectors, include numerous networks and serve a variety of functions. By definition, therefore, it is implied that firm networks are founded upon a relevant or similar need that creates weak ties across a host of firms or groups. Burt (2000) asserts that weaker connections among groups create competitive advantages for groups having relationships, and that these competitive advantages can span the structural holes. As Burt (2000) specifically states:

People are focused on their own activities such that they do not attend to the activities of people in the other group. Holes are buffers, like an insulator in an electric circuit. People on either side of a structural hole circulate in different flows of information. Structural holes are thus an opportunity to broker the flow of information between people, and control the projects that bring together people from the other sides of the hole. (Burt, 2000; p. 553)

Polenske (2004) adds a fifth factor to Hage and Alter's list of distinctions for firm networks. This fifth principle states that networks also generally span across regions. This added distinction underpins the concept that firm networks are grounded in weak ties based on whatever is relevant at the time for the firms. As Polenske (2004) notes:

Firms use networks as a way to expand their spatial and organizational boundaries. These are still basically economic considerations ... Considerations of social, cultural and political factors may also influence the firm to form and/or join a network (Polenske, 2004; p. 1034)

Polenske acknowledges the relevance of the various connection types: the spatial/physical connections, the economical/organisational connections and the social/cultural/political connections. In this paper, the three areas of connections emerge both from Castell's (2005) approach on spaces and the flow of information and from Polenske's (2004) approach on the network of firms and connection types. The three connections are in the following named: social, physical and economical connections. It is projected, based on the literature review, that the more connections a networking firm establishes in all three areas will benefit the growth in turnover within the networking firm.

As Castells (2005) and Burt (2004) indicate, the heterogeneity of information flow is valuable to firms. However, different perspectives on value creation have been highlighted in the literature. For example, Polenske (2004) reveals a triangle of relationships among competition, collaboration and cooperation in networks of firms at the regional levels. This triangle of connections, according to Polenske (2004), results in a reduction of costs from cooperation and competition. This relationship and the subsequent results were initially identified by Coase (1937) as the 'transaction costs' approach and were later elaborated upon by Williamson (1996). The transaction costs approach compares the costs associated with coordinating the transaction to one of two sources of origin for the transaction - the external market or the internal organisation. It must be determined if it is more cost effective to coordinate the transaction through the external market (competition) or more efficient to have the hierarchical organisation oversee and cooperatively manage the transaction. The latter option may be particularly desirable in the event of a difficult or vulnerable transaction. The boundary between the external market and the internal organisation is defined and managed for economic benefit as it relates to the transactions for goods and services. Value is added through these transactions, and it creates a value chain with coherent entities within the value system and network from the conception of the product to the final delivery, thus resulting in value creation through reduction of

transaction costs. Cooperative arrangements can then lead to external economies of scale, affecting the overall position and shape of the cost curve reducing average costs of producing at all scales of production. Value also results, according to Polenske (2004), in cost reductions from collaboration, which can be described as adaption costs. According to Polenske (2004), collaboration arrangements among firms often lead to internal economies of scale. These resulting economies of scale may well affect the position the firm has on its long-run average cost curve. For example, by collaborating on the design and production of a product, two or more firms can lower their adaption costs and more quickly create new products. This leads, in turn, to workers acquiring new skills and firms increasing their capital investments. Each of the three factors, cooperation, competition and collaboration, has an impact on growth, but in different ways, within the economic space. Competition and collaboration have direct impacts on growth through value chain connections. Collaboration also has an indirect impact on growth through innovation activities within the value chain activities of the firm, which also fuels growth in turnover.

From these theoretical considerations, it is expected that more economic connections are beneficial for growth in turnover for the entrepreneurial private firm. It is also anticipated that increased value chain activities enhance the changes or modifications to the entrepreneurial firm, thereby supporting the use of collaboration opportunities and supporting growth in turnover.

Thus, the theoretical review relates to several important hypotheses regarding the impact that connections among the social, physical and economic factors have on growth in turnover at private entrepreneurial firms. In the next section, these hypotheses are discussed in greater detail.

Hypotheses about the Impact of Connections on Growth

A review of the literature highlights the three connection characteristics of social, physical and economical connections. Upon closer scrutiny of these three characteristics, it can be inferred that the opportunities for social and physical contacts present themselves earlier than do the opportunities for economical connections.

The physical connections and flow are embedded within the facilities and the infrastructure created over time within the rural physical space. The social connections and flow are embedded in the inhabitants and the infrastructure of the rural social space. As the entrepreneur begins the initial steps of creating the firm, the organisation and value chain have to be established. This results in a natural time lag for creating economic connections and the value chain of the firm within the rural economical space. The economic connections elucidated here represent an intermediate impact that results from the impact of the social and physical connections on the economic connections. All three connections have a direct impact on growth in turnover. The hypotheses can then be derived as follows:

Hypotheses:

Direct impact:

1. The number of social connections has a positive impact on innovation/growth.
2. The number of physical connections has a positive impact on innovation/growth.

Intermediate impact:

3. The number of social connections has a positive impact on the number of economic connections and the number of value chain activities.
4. The number of physical connections has a positive impact on the number of economic connections and the number of value chain activities.
5. The number of economic connections and value chain activities has a positive impact on innovation/growth.

All hypotheses have one direction, which means a one-tailed significance level of the value of $p < 0.05$ is acceptable for significance.

Data Collection Method in the Three Networks

In collaboration with a project team at CLF (Center for Landdistriksforskning)–Danish Institute of Rural Research and Development at the University of Southern Denmark – in the spring of 2009, we developed a questionnaire for three different food networks:

- 'Sønderjyske Madglæder' (Food Joys of Southern Jutland) – 27 SMEs in the food industry in Jutland.
- 'Vadehavsprodukter' (Wadden Sea Products) – 85 SMEs, of which 49 SMEs are located in Southwest Jutland.
- 'Småøerne' (The Small Islands) – 17 SMEs within the food industry located on the smaller islands of Denmark.

The questionnaire was intended to obtain information on basic economic factors, growth, connections, organisational culture and innovation or improvements in the participating SMEs within the network. The questionnaire was also intended to provide information about the firm's use of the network. This paper deals only with the connections within the physical, social and economical spaces and the participant firm's growth in turnover.

Data were collected through an online questionnaire with controlled quantifiable responses combined with open comments for each question, meaning that the data are primarily quantitative with supplemental qualitative comments. For the quantitative data, a 7-point Likert interval scale was used. This interval scale was selected because it is not as time-consuming as other scales; it is easy to administer; it is easy for the respondents, who have a non-literary background, to access and understand; it encourages quick, impulsive responses; and it ensures adequate response rates and reliable data. The questionnaires were tested by the research team and three respondents from the committee of each of the three networks.

An analysis of this kind has not been conducted in these relatively newly established networks. Their responses can, therefore, be regarded as the first contribution to a general clarification of the networks' foundations. To ensure the validity and reliability of the instrument used for the gathering of data, the questionnaire was made

accessible and understandable to all relevant respondents. This required the administration of pre-tests of the online system. Further, a pre-test that evaluated the wording and the structure of the questionnaire as well as a test of the questions themselves needed to be performed. The questions were based primarily on previous observations in the network called 'Food Joys', which are described in a separate working paper. Valuable comments and suggestions were received from the various respondents, and these were incorporated into the questionnaire before the final distribution of the questionnaire to all participants in the three networks.

The response rate for the data collection was satisfactory. In total, 65% of the respondents who could answer the questionnaire replied. The response rates were slightly different among the three networks. The highest response rate was 78%, and the lowest was 53%. The response rate was satisfactory for the continued analyses. In total, 60 respondents answered, and they formed the basis for the analyses.

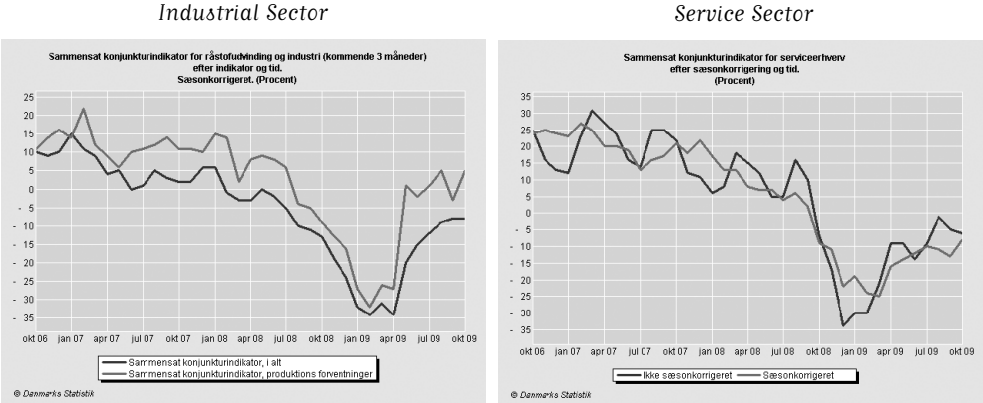
Five members overlap in the different networks, meaning that they participate in two of the three networks. In the data analysis, the five firms that participate in multiple networks were thus counted twice for the basis of the analysis. The networks were evaluated independent of any other affiliations the members may have had.

Variable Construction within Growth and Connections

A short description of the network profile in economic terms provides an understanding of what financial resources are available within the networks. The three networks represent an estimated total turnover that corresponds to approximately 100 million Euro calculated on average figures from the responses distributed among the networks with 30% in the 'Food Joys' network, 65% in the 'Wadden Sea' network and 5% in the 'Small Islands' network. A similar calculation can be carried out on the total workforce of fulltime staff, which includes 700 employees in all three networks. This indicates that the networks are a considerable resource in the Danish economy. The turnover for the firms in this study corresponds to the 500th firm in KPMG's list of the 1,000 largest firms in Denmark. A better understanding of growth in the entrepreneurial networks is, therefore, an interesting and important issue to research regarding the development of rural areas in Denmark.

The data were collected between April and May of 2009 when the financial crisis had a marked impact on the Danish firms. This is evidenced by the business barometer for industry and services from Statistikbanken of Denmark in Figure 5.0, which shows the base indicator for the industry on expectations of production in the coming three months, an assessment of backlog and finished goods stocks and the indicator of service industries' weighted expectations of employment and turnover in the coming three months.

Figure 5.0.
Financial Crisis and Growth Expectations (Statistikbanken)



It can be seen in Figure 5.0 that both indicators reach their minimum from January to April. However, after that timeframe, expectations of the three-month period become more and more positive, increasing to approximately zero. The network firms are all either within industry and/or service. The cyclical image is considered to have a spillover effect on the firms' expectations for growth over the next two years. It is further anticipated that the growth in the long term will not be as sensitive to changes in expectations over a three-month period. As a result of the dramatic decrease and length of the period of the financial crisis, it is logical to conclude that there will be lower growth for the next two years. Though the food industry is usually more stable than other industries because of the continuous need for food in the population, the financial crisis has had a serious negative impact as shown by a review from the Danish Industrial Food Association, which reported that the turnover from June

2008 to January 2009 was reduced by 8.5%. The serious negative effect is also evidenced by the Nielsen survey on Global Consumer Confidence, Concerns and Spending in the first half of 2009, which reported that 41% of global customers had begun to switch to less expensive grocery brands.

Description of growth in the network

The results from the data are shown in Figure 5.1.1. The data reflect the firms' average growth rate during the past two years and project the anticipated growth rate for the coming two years. A study of the growth rates thus far reveals that the rates are very high in comparison to the general growth in Denmark in terms of GNP per year at current prices. The GNP development in Denmark is registered by Statistikbanken to be + 1.8% in 2007 and -.3% in 2008, which are the two years covered in this research. The negative development in 2008 is dominated by the financial crisis in which the 4th quarter alone had a negative GNP growth of -2%. In comparison, the EU had a negative growth rate in the 4th quarter of 2008 of -1.5%, and the United States had a negative growth rate of -1% during this same period of time. Considering that the networks' growth is measured over two years while GNP is measured annually, the networks had well over twice the growth of the overall GNP growth in 2007. The high growth can be seen in all three networks, as shown in Figure 5.1.1

*Figure 5.1.1.
Growth Rates for the Last Two Years and Anticipated Growth for the Next Two Years*

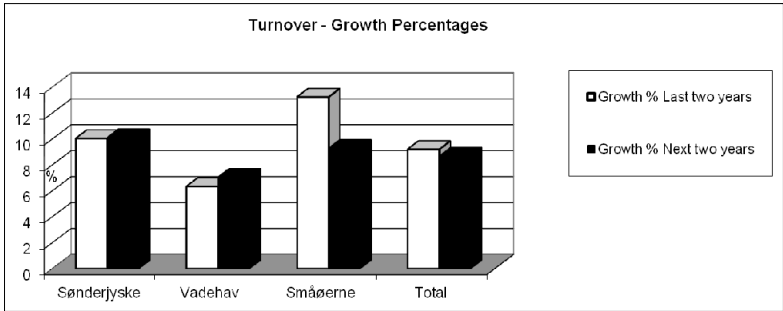


Figure 5.1.1 shows that despite the financial crisis, the network members expect to continue to grow at relatively the same high level. Though the network 'Small Islands' expects a decline from the very high growth rate they have experienced for the past two years, 'Food Joys' and 'Wadden Sea' expect a continued increase in growth. Overall, it can be concluded that the firms expect the same or a moderate increase in growth. This implies a continued high level of growth of 7% and 10%. From the qualitative comments on growth rate, the members are aware of the financial crisis, but they have established new initiatives that they expect will offset the effects of the crisis and lead to growth for their businesses over the next two years. This suggests a strong commitment and dedication to growth in turnover in the SME network firms even though the conditions for growth are extremely challenging. In 2010, the researcher contacted some of the firms and found that their growth expectations in 2009 to 2010 were actualised. Further research on the growth issue in the networking firms would be interesting to pursue in 2011 and 2012.

In the questionnaire, a long-term perspective on growth over two years is applied. The length of the financial crisis will logically affect the period's expectations.

- Growth in turnover for the past two years – Variable: growth last two years
- Growth in turnover for the next two years – Variable: growth next two years

A statistical factor analysis of the growth issue was performed on the data collected and is presented in Table 5.1.2.

Table 5.1.2.
Analysis of Growth Variables

	Component 1
Growth last two years	.872
Growth next two years	.872

Extraction Method: Principal Component Analysis
a.1 components extracted.

Table 5.1.2 suggests a clear positive correlation between past growth and future growth within these networks. Therefore, they are combined in an index for growth referred to as I-growth and entered into the statistical analysis. The index rep-

resents the growth issue as perceived by the networks. Growth in the analysis is thereby defined as the average combination of growth for the past two years and the expected growth for the next two years in standardised form. The growth variables are skewed with many observations near the mean growth rate and a few observations at very high growth rates. Therefore, a logarithm of LN is taken to reduce the weight of the "very high observations" and thus reduce their impact on the causal effect. Furthermore, a diminishing impact of the causal variables is anticipated; therefore, the few very high observed growth rates require a reduced weight to sustain the causal relation.

5.2 Description of connections in the network

Connections are examined based on the controlled responses giving by the respondents to the questions relating to connections in social, physical and economical spaces. The questions and controlled responses are as follows:

What activities can be found in the firm? – Variable: Number of value chain activities – representing the computation on number of economic value chain activities.

Answer Categories: *Agriculture; Manufacturing products; Manufacturing concepts, service or stories; Distribution; Sales of products and services from own business; Product sales in retail chain; Sales of products and services by another firm/person; Use of consultants and advisers; and Miscellaneous.*

Major connections on these activities? – Variable: the variable representing number of economic connections is further elaborated in factor analyses of answer categories within the value chain.

Answer Categories: *the same as for the earlier question: what activities can be found in the firm?*

How is the owner connected to the local area socially? – Variable: Number of social connections – representing the computation on the number of social connections.

Answer categories: *Family, Friends, Network with other persons in the area, Work-related network and Other connections.*

How is the owner connected to the local area physically? – Variable: Number of physical connections - representing the computation on the number of physical connections.

Answer Categories: *Land, Buildings, Other natural resources, Access to main arterial road,*

Other infrastructure, Regional development grants/other grants and Other physical connections.

The number of economic connections are counted and elaborated in factor analyses in relation to answer categories on each value chain activity. Value chain variables are shown below:

- Agriculture
- Manufacturing of products
- Manufacturing concepts, service or stories
- Distribution
- Sales of products and services from own business
- Product sales in retail chains
- Sales of products and services by another firm/person
- Use of consultants and advisers
- Miscellaneous

A statistical factor analysis on dimension reduction was performed on these variables to reveal their correlation - Table 5.2.1.

Table 5.2.1.
Factor Analysis of Connection Variables

	Rotated Component Matrix ^a		
	1	2	3
Agriculture	.077	.820	.226
Manufacturing of products	.700	.072	.480
Manufacturing concepts, service or stories	.004	.156	.883
Distribution	.904	.207	-.151
Sales of products and services from own business	-.116	.097	.516
Product sales in retail chains	.933	.175	-.008
Sales of products and services by another company/person	.270	.838	.003
Use of consultants and advisers	.088	.839	.012
Miscellaneous	.200	-.073	.756

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 5 iterations.

Table 5.2.1 reveals a clear positive correlation divided in three components. The first contains agricultural activities with the following variables: Agriculture, Sales of products and services by another firm/person and Use of consultants and advisers. The second compartment contains production activities with the following variables: Manufacturing of products, Distribution and Product sales in retail chains. The third compartment contains service activities with the following variables: Manufacturing concepts, service or stories, Sales of products and services from own business and Miscellaneous. The results indicate that collaboration partners in the network are typically clustered within these three areas. Three indexes are therefore created as follows: one for Agricultural activities – number of connections, one for Production activities – number of connections and one for Service activities – number of connections. They are defined as the average combination of the variables contained in the three indexes. They are entered into the analysis in standardised form.

The validity of the variables measured for the testing of the hypotheses is measured by bivariate correlation analyses, as shown in Table 5.2.2.

Table 5.2.2.
Bivariate Correlation Analyses on Constructed Variables

	Number of Social connections	Number of Physical connections	Agricultural activities. Number of connections	Production activities. Number of connections	Service activities. Number of connections	Number of value chain activities	I-growth
Number of Social connections	1						
Number of Physical connections	.385**	1					
Agricultural activities. Number of connections	-.168	.137	1				
Production activities. Number of connections	.034	.299*	.340**	1			
Service activities. Number of connections	-.032	.249*	.165	.165	1		
Number of value chain activities	.020	.523**	.486**	.367**	.242*	1	
I-growth	.157	.310*	.044	.194	.191	.310*	1

** . Correlation is significant at the 0.01 level (1-tailed).

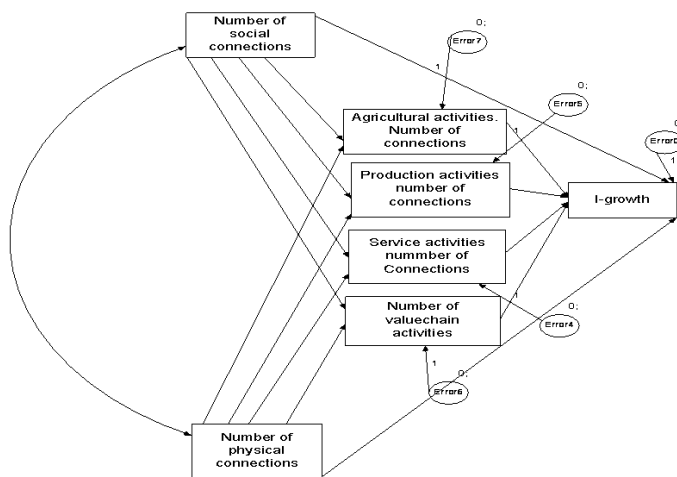
* . Correlation is significant at the 0.05 level (1-tailed).

Figure 5.2.2 suggests that the number of social connections and physical connections are significant but correlated only to a factor loading of 0.39. This suggests that the variables are significantly overlapping, but they do not represent the same measure because an individual measurement of the two variables is represented by a value of 0.61. It was also found that agricultural and production activities are correlated. The number of value chain activities correlated with agricultural, production and service activities. The factor loadings range between 0.24 and 0.49, which again leaves a proportion of these variables to individual measurement. The overlapping was anticipated based on the literature review. It was also anticipated that the results would represent separate variables. The six variables from the results are kept as single measurements of their construct for use in the structural equation model presented in the next section.

Statistical Modelling in AMOS, Analyses and Results

The hypotheses were evaluated in a causal modelling tool called AMOS (Analysis of Moment Structures). A prerequisite to implementing AMOS is the existence of a time-difference in the occurrence of the elements. In the model, social connections and physical connections are perceived as prerequisites for the four variables within economic space and for growth. Social and physical connections are present before the firm can organise for innovation and growth through the creation of the value chain activities and the establishment of external business connections. Organising external collaborative partnerships and the heterogeneity of value chain activities are seen as prerequisites for innovation and growth in turnover. The organising of connections makes it possible for the network to perform and execute economic value-creating activities.

Figure 6.1.
Path Diagram of the Impact of Connections on Growth



The hypotheses were tested in a stepwise backwards elimination of the least significant factor combination. The hypotheses were all one-tailed, which gives a significance level for causal effect of $p < 0.05$. In this study, the sample was relatively small for employing this significance level. The analysis is based on maximum likelihood estimation. The significance level is shown in Table 6.1 where p ranges from zero to 0.016, which is far below the required significance level.

Table 6.1.
Level of significant Estimations in Path Diagram

		Estimate	S.E.	C.R.	P Label
Number of value chain activities	Numbre of phisycal connections	1.205	.224	5.379	-
Number of value chain activities	Number of social connectios	-.539	.224	-2.404	.016
I-growth	Number of value chain activities	.074	.030	2.445	.014

Furthermore, it is relevant to look into the goodness of fit in the model by revealing the statistics relating to model fit. In Table 6.2, the incremental fit indices represented by the comparative fit index, or CFI, is shown.

Table 6.2.
Incremental Fit Indices - CFI

Model	NFI Delta 1	RFI rho 1	IFI Delta 2	TLI rho 2	CFI
Default model	.903	.513	.954	.702	.940
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

In Table 6.2, a CFI of 0.94 is shown. This exceeds the CFI guidelines of greater than 0.90 to represent good fit. This is, therefore, acceptable for the purpose of these analyses.

It is also relevant to examine the absolute goodness of fit measure represented by the root mean square error of approximation, RMSEA. The findings of RMSEA are shown in Table 6.3.

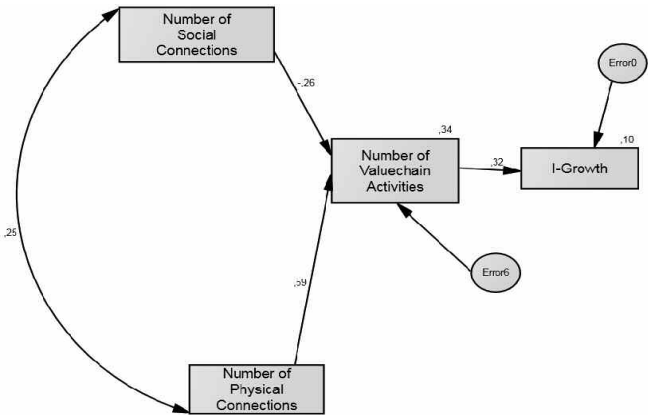
Table 6.3.
Absolute Goodness of Fit Measure - RMSEA

Model	RMSEA	LO90	HI90	PCLOSE
Default model	.115	.000	.303	.209
Independence model	.211	.141	.285	.000

In Table 6.3, the RMSEA is 0.115. Employing the 90% confidence interval for this RMSEA, it can be concluded that the true value of RMSEA is between 0.00 and 0.303. This is satisfactory for the model; however, it is in the high end of the established values, < 0.08 (Hair, Black, Babin and Anderson, 2008), for a good fit. As the RMSEA is best suited for larger samples, the fact that our sample was of rather limited size could be the reason for the higher values within this measure.

The causal relations of significance are graphically shown in the path diagram in Figure 6.2.

Figure 6.2.
Path Diagram with Significant Causal Relations from Connections to Growth



In the three networks, there was a standardised proportion of 0.25 covariance. This score indicates a relatively high degree of correlation between social connections and physical connections. This result was expected based on the literature review. In relation to growth, however, neither the number of physical connections nor the number of social connections had a significant direct impact.

The analyses of the indirect impact revealed an effect through the number of value chain activities. The relationship between the number of physical connections and the number of value chain activities had a significant proportion of influence of 0.59. The number of social connections also had a significant proportion of influence on the number of value chain activities, but this influence was negative with a proportion of -0.26. The number of value chain activities had a significant proportion of 0.32 influence on growth. The indirect impact from the number of physical connections on growth was $(0.59 \times 0.32) = 0.189$. The indirect impact from the number of social connections on growth was $(-0.26 \times 0.32) = -0.083$. This means that the number of physical connections is much more valuable for growth than the number of social connections, even though they covariate. The number of social connections has an indirect negative impact and thereby reduces the overall positive impact on growth from connections.

It is considered surprising that the number of social connections had a negative impact on growth. This may be because the social contacts had a defocusing effect on the individuals within the firms or because too much time was spent on the social connections, which did not create value. Furthermore, there could be an element of 'group thinking' that limits the perception of 'what we can do' and 'what we should do'. Burt (2000) refers to this as closure, which he sees as a stasis forming equilibrium action rather than change action for growth. The covariance of social connections to physical connections has an impact. Here, the embeddedness of social capital in the physical space is indicated (Svendsen and Svendsen, 2009). Also surprising is that the number of external connections and collaborations does not, in itself, have a significant impact on growth. Within the economic space, it is the heterogeneity of activities and functions that plays an important role for innovation and growth; the ability of the private entrepreneur to combine a variety of activities. The number of connections and collaborations does not seem to have a direct significant impact, although this was anticipated as a result of the knowledge sharing effect. Too much time can be spent discussing the many connections, and this could serve as a distraction from the overall goals. The result could be many widespread activities with limited coordination and, therefore, limited impact.

Physical connections appear to contribute to and support growth in these networks. Improving the opportunities for activities embedded in the physical rural area also appears to have a positive impact on growth as does the ability of the private entrepreneur to coordinate many different activities. This then leads to a need to train private entrepreneurs on how to utilise their connections to the physical space and implement a variety of value chain activities. This has policy implications in terms of providing the necessary support to the physical facilities and infrastructure along with the requisite support needed to build capacity and develop those skills required in the value chain.

Discussion of Findings

The effects of the embedding and the overlapping of the three spaces and connections are supported through the statistical analyses of the correlations. This is also true when examining the impact the connections have on each other and on growth. These effects are both a strength and weakness, however, as the findings disclose the positive impact while simultaneously creating measurement challenges. While the overlap can easily blur the individuality of the variables, the significance in the findings supports the positive effects of the connections. Further research is needed to explore the impact from economic connections on growth to find out if the answers on economic connections are too faintly represented in the data.

A contribution to network theory and economic development is made by the significant findings that physical connections and the heterogeneity of value chain activities have a positive impact on growth. More research needs to be conducted on the effects of enhancing physical connections and value chain activities on growth. It is assumed that there will be a limitation on the positive impact at some point. Currently, the significant findings of positive impact support the approach of the new rural paradigm (OECD, 2006) in which employment and utilisation of local resources are seen as important for rural development. Furthermore, the heterogeneity in the value chain emphasises that the capabilities of the networking entrepreneurial firms is important for economic development. This heterogeneity also promotes the need for flexibility within the entrepreneurial firm and the need to adapt internal activities in relation to external opportunities.

In terms of policy implications, a requisite need has been identified for local resources and infrastructures to support economic development. Furthermore, a flexible approach to policy will allow for the greater support of various activities such as providing training and infrastructure activities needed for enhancing the value chain. Greater insight and understanding of the connections has been garnered through this study, providing the information needed to organise connections among networks and firms.

Conclusion

This paper illustrates what impact connections in private networks of entrepreneurial firms have on growth in turnover in these firms. Three Danish food networks with 60 private entrepreneurial firms provided the data for the analyses. The research question was explored through a quantitative study employing structural equation modelling on the impact of connections on growth in turnover. Through a stepwise backwards elimination of causal relationships, the significant impact was revealed.

An embedded relationship between social, physical and economic spaces was found. The decomposition of relations in this paper gives an important insight into the causal relations. Innovation and growth in turnover are important for the private entrepreneurs within the networks. The entrepreneurs show dedication and commitment to growth even though at the time of the study they were in the midst of a severe financial crisis. Generally, the three networks represent a significant economic force that corresponds to a ranking of 500 in the list of the Danish top 1000 firms. This suggests that networks provide a significant resource for growth and development in the rural areas of Denmark. Moreover, the experienced growth and expected future growth in these networks are at a level equivalent to just over twice the overall development in the Danish society. Therefore, an understanding of the growth issue in these networks represents a significant potential for the development of rural areas.

The findings reveal that social and physical connections have no direct significant impact on growth, but physical connections have a high indirect impact on growth through the heterogeneity of value chain activities. Social and physical connections have a high covariance that reveals the embeddedness of the three spaces

within the causal modelling. Social connections have a surprisingly negative impact on the heterogeneity of activities of the private entrepreneur. It is also surprising that a significant impact on growth does not come from the number of collaborations itself but from the heterogeneity in the value chain. It is the ability of the private entrepreneur to deal with many different activities in the value chain that significantly facilitates growth.

This paper contributes to network theory by demonstrating the impact that connections in private networks have on growth in turnover. Further research within this area is important to obtain a deeper understanding of the growth of firms within private networks. It follows that a contribution to policy initiatives is also framed on emphasising physical facilities, infrastructure facilities and on providing flexible learning and training approaches. Moreover, a contribution is made to networks and networking participants to organise and incorporate those activities that support growth. Perspectives on further research can enhance theory, policy implications and practical behaviour in private networks and, consequently, support rural development.

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