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## What determines suppliers' intensity of participation in the EU School Fruit Scheme?

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*The purpose of this study is to identify the determinants of suppliers' intensity of participation in the EU school fruit scheme (SFS) based on the example of the SFS in the German federal state North Rhine-Westphalia. In 2013/2014 approx. 100 suppliers including many agricultural enterprises or farm shops took part in a telephone survey. The data was processed by a factor analysis. Multivariate regression analyses were used to examine the determinants of intensity of participation. The findings reveal that the intensity of participation is influenced by the buyer-supplier-relationship, performance indicators and different types of costs.*



## 1 Introduction

Particular public school food procurement programs initiated in several countries pursue two objectives: to strengthen the viability of local agricultural production systems and to counteract the health status deterioration among children due to poor eating habits (Bagdonis et al. 2009; Vogt and Kaiser 2008). In the US, for example, more than 1,000 single farm-to-school programs have been established across 34 federal states since the 1990s, when the first pilot projects were initiated (Kalb 2008). This emergent trend is continuing, with more than 40,000 schools covered under these programs (National Farm to School Network 2014). Despite the practical relevance of these programs, only a few studies have investigated the role of suppliers in the US farm-to-school and fresh fruit and vegetable (F&V) programs (Izumi et al. 2010a; Peterson et al. 2010).

What is already known of the factors determining participation in these programs is restricted to the US and there are only very few equivalent results emerging from the EU. The results of these studies indicate that economic as well as non-economic factors determine suppliers' participation in such programs. Regarding economic motives, only a few studies have found a relatively high increase in suppliers' sales and profit (Conner et al. 2012). Most previous studies suggest that food service sales to schools often represent only a very small percentage of farmers' income (Izumi et al. 2010a; Izumi et al. 2010b; Bridger 2004; Joshi and Beery 2007; Ohmart 2002). Nevertheless, participation in those programs is consistent with farmers' overall economic strategy of spreading their risk across different markets (Izumi et al. 2010a). In addition, Hoellmer and Hartmann (2013) show, in a qualitative study for Germany, that suppliers see their participation in school schemes as a means to improve their reputation and, thus, to potentially win new customers (e.g., citizens in the local community).

Although the economic aspects and the perceived future market potential of school food services are important reasons for participation in such programs, farmers do consider non-economic motives as well, such as the social benefits of the program (Izumi et al. 2010b). For example, the feel-good factor from helping to improve children's dietary habits and supporting the local community has been identified as an important motive (Izumi et al. 2010b). This finding reveals that social embeddedness plays a role in inducing farmers to participate in such programs.



Recent developments have led to new, more complex, and larger local food systems with new actors (Buckley et al. 2013). Whether social relationships continue to be important in this changed scenario is therefore a relevant question. Buckley et al. (2013) maintain, in a qualitative analysis of a US farm-to-school program, that relationships of trust remain stable even if local food systems are becoming larger and more complex. Bateman et al. (2014) find, in another qualitative study, that separating economic opportunities and social benefits in US farm-to-school programs is hardly possible (Bateman et al. 2014). Employing a quantitative approach, Conner et al. (2012) identify three clusters of school supplier participants in the US: a socially motivated cluster, a low engaged cluster, and a market-motivated cluster. The last constitutes the smallest group among the three identified clusters. Compared to the other groups, these suppliers have a significantly higher sales volume of food per school, have the greatest percentage of respondents who reported a benefit for their own enterprise, invest in the capital requirements of the program, and experience an increase in farm profitability (Conner et al. 2012).

Similar to the US programs, the EU School Fruit Scheme (SFS) aims to promote a healthy diet and to stabilize regional food markets. More specifically, the aim of the SFS is to encourage F&V consumption among European schoolchildren and to strengthen the F&V market in the EU. Although the SFS has been implemented in 24 EU countries since its initiation in 2008/09, to the best of our knowledge, no quantitative study has so far identified or analyzed the relative relevance of the factors motivating farmers and retailers to get involved and stay with this scheme. The objective of the present study is to reduce this research gap. In our analysis, we concentrate on North Rhine-Westphalia (NRW), the largest federal state in Germany. The target group of our investigation consists of suppliers who already participate in the SFS. Therefore, the analysis focuses on investigating suppliers' willingness to change the degree of their SFS participation intensity.

### **1.1 Public procurement in the EU: the EU SFS**

Recently, considerable structural changes have taken place in the German horticultural sector. The number of F&V growing enterprises has declined, while at the same time, the total acreage cultivated with horticultural products and the intensification of production has increased (Steinborn and Bokelmann 2007). Between 1994 and 2005, the number of farms growing F&V



decreased by 40%. Consequently, small-sized farms, in particular, had to give up their business (Dirksmeyer 2009). However, the horticulture value chain has become increasingly concentrated at all levels, creating challenges not only for small- and medium-sized enterprises (SMEs) that grow fruits and vegetables but also for those SMEs that trade in such produce. SMEs have used differentiation, among other responses, to respond to the emergence of large and partly multinational competitors and supply chain partners in the value chain (Hinson 2005). Policy-driven initiatives can also play a role in this respect. Local food schemes have been implemented to foster the marketing of regionally produced food to institutional buyers. They have been introduced as a new instrument to link producers and consumers and establish more sustainable food networks (Peterson et al. 2010).

The SFS initiated by the European Union belongs to the group of policy driven procurement programs. It was launched toward the end of the 2009/10 academic year. Implementation of the scheme commenced in March/April 2010 in 350 primary and special schools in NRW. Children in participating schools are provided with F&V free of charge. Uptake of the scheme has been growing steadily, and for the 2013/14 academic year over 800 schools were enrolled (European Commission and MKULNV 2012; MKULNV 2015). In the same year, 130 active suppliers participated in the SFS. The price F&V suppliers receive (30 cents/100 g) and the quantity of F&V each child obtains (100 g/portion; 3 portions/week) are fixed. Firms interested in providing schools with F&V in the SFS framework in NRW can apply for authorization. Schools eligible to receive F&V in the SFS package can choose from the list of authorized suppliers, which is published on the official NRW SFS website as are the schools participating in the SFS. Both sides can terminate the supply relationship within a short period of time, for example, if the schools are not satisfied with the quality or service of their seller or the supplier does not feel that the co-operation with the school is beneficial. This procedure secures a direct relationship between suppliers and schools.

## **1.2 The intensity of participation in public programs**

Even though programs aiming to connect local SMEs, especially farmer units, to school procurement systems is a relatively new, fledgling movement, qualitative studies in the US, in particular, have already analyzed the supplier's motivation (Izumi et al. 2010b; Conner et al.



2012; Bateman et al. 2014; Thornburg 2013; Berkenkamp 2006; Allen and Guthman 2006; Kalb 2008; Schafft et al. 2010; Thompson et al. 2014; Vallianatos et al. 2004). These studies' findings on program outcomes differ, but they are unanimous about the economic as well as social motivation for participation. Evidence for the EU is still lacking despite steady growth of such programs in nearly all member states.

Theoretically, most studies are based on different approaches. In particular, a combination of the concepts of embeddedness, marketness, and economic instrumentalism has become a robust framework in the analysis of alternative food networks, including school procurement programs (Izumi 2008; Izumi et al. 2010b; Thornburg 2013; Morgan and Sonnino 2008; Hinrichs 2000). The concept of embeddedness is based on Polanyi's (2001) critique of the market economy, developed in the middle of the 20<sup>th</sup> century. According to this theory, the economy has always been embedded within the social framework of our societies and is subordinated to politics, religion, and social relations (Polanyi 2001; Izumi 2008). In the context of several studies, embeddedness refers to the values (e.g., community and health) and non-monetary variables (e.g., equity and localness) that influence economic transactions (Izumi 2008; Kirwan 2004; Goodman 2003; Marsden et al. 2000). However, studies have also warned that a one-sided view leads to a too romantic and optimistic analysis of food networks (Izumi 2008; Hinrichs 2000; Goodman 2004; Winter 2003; Born and Purcell 2006). The supplementation by marketness and instrumentalism reduces this risk. While marketness analyzes the strength of monetary signals, instrumentalism measures the extent to which individual economic benefits play into economic behavior (Izumi 2008). At one end of the continuum, transactions are purely motivated by economic self-interest. At the other end, behavior is determined by variables such as community or morality (Izumi 2008; Hinrichs 2000; Thornburg 2013).

We adopt the same economic and social drivers of the supplier participation in the SFS identified in the previously mentioned studies. This consensus has guided the formulation of our hypotheses, which are explained in the following section. Participation can be defined as the sum of actions taken by members of a system in order to influence or attempt to influence outcomes. Participation varies in extent and intensity. It is considered increasingly extensive as more people engage in it and more intensive as its cost to the individual in effort, money or time increases

(Singer 1995; Hardin and Nagel 1989). In physics, intensity is defined as the activity/power per unit area. Transferred to human behavior it measures the activity or involvement in e.g. a program (Andrews et al. 1990; Scharnberg 2010). The intensity of participation (PART) may include the willingness to participate supplemented by further aspects like the willingness to change the business focus in favor of another activity (in this case the participation in the SFS). In contrast to the willingness to participate, which is the target variable in several studies, PART refers to already participating suppliers in particular.

For many suppliers, the SFS combines two different novelties: development of a new trade channel (Hoellmer and Hartmann 2013) and participation in a policy-driven public program. Aibinu and Al-Lawati (2010) propose, citing the example of e-bidding, that the perceived barriers and benefits, especially the former, of using new trade channels as well as long-term reliability concerns are factors influencing the intensity of participation. Reluctance to use new trade channels is especially high where traditional channels have proved reliable whereas the new ones are associated with uncertainties. The study also indicates that respondents consider the entry costs of building new business opportunities relative to their perceived or real benefits (Aibinu and Al-Lawati 2010). In addition, concerns about the development of a new trade channel, for example, due to high or even unfair competition, reduce a supplier's PART (Zanetell and Knuth 2004). The results of the studies cited indicate that to understand why suppliers get involved in new trade channels, as offered by the SFS, it is important that one consider the investments required to participate in this trade channel (e.g., material investments as well as new staff), the degree of reliance (level of competition), the transaction costs, and the economic benefits. However, as our analysis does not focus on the SFS accession process but on the willingness to intensify participation in this new channel, investments likely play a more ambiguous role. This is the case since investments usually include sunk costs that cannot be recovered, potentially leading to path dependency, especially for very small businesses that are in general more hesitant to make investments (Skuras et al. 2008).

Business performance measures can be classified as either financial or operational (non-financial) (Venkatraman and Ramanujam 1986). Financially oriented measures of success such as profit indicators or sales alone are not always appropriate to capture the whole picture.



Therefore, both financial and non-financial measures of business performance are likely important (Toledo-López et al. 2012; Reijonen 2008; Haber and Reichel 2005; Tregear 2005; Prahinski and Benton 2004). Non-financial measures can include entrepreneurial satisfaction or perceived customer satisfaction (Haber and Reichel 2005) and contentment due to adherence to traditions or the feeling of autonomy and pride (Reijonen 2008; Paige and Littrell 2002). The latter are more difficult to operationalize but can be linked, in the SFS framework, to the conviction that one's own action is successful (i.e., it improves child nutrition) and to key non-price competitive success factors such as quality, delivery of service, and flexibility (Prahinski and Benton 2004; Venkatraman and Ramanujam 1986). These factors can also be used for self-evaluation of a supplier's fit for the SFS market. The importance of product- and service-related factors for sustained competitive advantages, especially for SMEs, is also emphasized by Salunke et al. (2013). In line with the above expositions, we derive the following hypotheses:

**H1a.** The higher the impact of the SFS on a supplier's financial performance, the higher the PART.

**H1b.** The higher a supplier's entrepreneurial performance in the SFS, the higher the PART.

**H2a.** The higher the investments already made, the higher the PART.

**H2b.** The higher the transaction costs linked to the participation in the SFS, the lower the PART.

**H2c.** The higher the level of perceived (unfair) competition in the SFS market, the lower the PART.

**H3.** The more suppliers are convinced that the SFS has improved child nutrition, the more they are willing to participate.

Suppliers' intensity in using new trade channels such as selling their products in recently introduced public procurement programs is determined by a multitude of factors that likely go beyond the ones discussed above. The theory of embeddedness (Polanyi 2001) and Granovetter's (1985) paradigm of social embeddedness acknowledge that economic action and institutions are



affected by social relations. Further, theory claims that economic life is submerged in social relations (Granovetter 1985). The theory stresses the importance of personal relations and networks of relations in economic life (Rooks and Matzat 2010), implying that this is a supplementary and partly rival concept to the neoclassical theory (Schmid 2008; Izumi et al. 2010b). According to this theory, the buyer-supplier relationship has an effect on the supplier's success (Prahinski and Benton 2004) and influences the intensity of participation or rather the intention to intensify the supplier's efforts in a business relationship such as in the SFS.

Several studies characterize this aspect of relationship in terms of the strength of ties, the extent to which values are shared, and the level of trust (Li 2012; Dhanaraj et al. 2004; Kale et al. 2000). Since social embeddedness tends to reduce barriers against, for example, transfer of information, decreasing the differences between suppliers and buyers is an important step toward creating cohesiveness and building trust (Li 2012; Dyer and Nobeoka 2000). On the basis of these insights, social embeddedness can be defined as the degree to which a supplier builds networks and manages lateral relationships with buyers and is characterized in terms of tie strength and shared systems (Li 2012). Tie strength refers to the extent to which suppliers receive support from buyers or maintain their relationship with buyers, whereas shared systems refer to the extent to which a supplier shares information with buyers openly (Li 2012). This social interaction within the buyer-supplier relationship is important in explaining the success of new ventures, but is mostly under-represented in entrepreneurship research (Lechler 2001).

Furthermore, supplier commitment as part of social embeddedness has been found to be a strong driver of success (Li 2012; Shin et al. 2000). Performance differences are due to heterogeneous manufacturing capabilities and supplier commitment to operational activities. Buyers tend to choose the services of suppliers who demonstrate a higher level of commitment (Cormican and Cunningham 2007). Highly committed suppliers are devoted to ensuring the continued success of the relationship by providing buyer satisfaction, which in turn enhances their success (Li 2012; Prahinski and Benton 2004). Previous results also show that social embeddedness helps firms to manage their transactions with less effort. Although one-sided specific investments, as well as monitoring of problems and transaction volumes, lead to more negotiation efforts, such efforts decrease if transactions are "better" embedded in a temporal or



network sense or if buyers and suppliers can rely on more institutional embeddedness (Rooks et al. 2000).

The findings emphasize that the social relationship between a supplier and the school(s) could influence supplier's SFS participation intensity. Therefore, this study hypothesizes as follows:

**H4a.** The higher the degree of social embeddedness between a supplier and the school(s), the higher the PART.

**H4b.** Conflicts in buyer-supplier relationships have a negative influence on the PART.

## **2 Materials and Methods**

### **2.1 Data collection**

The data for this research were obtained by a telephone survey conducted between November 2013 and January 2014 based on a standardized questionnaire. Content validity was supported by a qualitative pre-study of guided interviews with 28 school fruit suppliers from NRW, an extensive literature review, and a pre-test of the questionnaire with 18 school fruit suppliers from another federal state with similar framework conditions. The aim was to conduct a census. Therefore, all of the 130 active suppliers were contacted. The response rate—at around 80%—was relatively high. Table 1 shows that almost all companies participating in the survey belong to the category of SMEs, according to the EU definition (2003/361/EC). Most of them are micro and small-sized enterprises. The 99 suppliers involved in the research comprise 36 agricultural enterprises and farm shops, 28 supermarkets, 20 F&V wholesalers, 13 greengrocers, and 2 others. Of all the companies, 58 are located in urban areas and 41 in rural or semi-urban areas. Descriptive statistics regarding annual turnover, number of employees, and number of served schools are shown in the last three rows of Table 2.

<<Table 1>>

<<Table 2>>



## 2.2 Dependent variable: participation intensity

The literature review provided only limited support for operationalizing the factors that determine suppliers' willingness to intensify their participation in a program such as the SFS. Some studies have a limited scope in that they analyze only the extent to which the suppliers are willing to participate using a single item (Aibinu and Al-Lawati 2010; Söderqvist 2003). Other studies use multi-item measures by also considering, besides the willingness to participate, the changes in business practices and cooperation (Zanetell and Knuth 2004), the willingness to assume risk (Napier et al. 1988), or the willingness to invest (Suh and Houston 2010).

Five statements were developed according to the insights from the literature (see Table 2). All statements were measured on a 5-point Likert scale. The dependent variable PART is determined as the unweighted average of suppliers' responses to these five statements:

$$PART = \frac{\sum_{i=1}^5 PART_i}{5}$$

PART<sub>2</sub> and PART<sub>3</sub> were reverted before the dependent variable PART was calculated in order to align with the scale of the other variables with a low value representing a low intensity of participation and a high value representing a high intensity of participation.

## 2.3 Independent variables: the basic items

To measure financial performance, this study used self-assessment questions concerning profit changes, sales turnover, and planning reliability (Li 2012, Cohen and Prusak 2001, Haber and Reichel 2005). Additionally, the overall yearly turnover, the number of employees, and the number of served schools (which is a reliable indicator for sales in the SFS) are considered. Besides financial indicators, business performance can also be measured by operational (non-financial) items. Regarding the latter, we adapted variables from the literature regarding smooth delivery, responsiveness to requests for changes, and service support, with each item evaluated relative to a firm's competitors' performances (Prahinski and Benton 2004). In addition, we asked the respondents about their perception regarding the level and fairness of competition in the SFS.

Suppliers may incur costs before entering the SFS (e.g., investments in new equipment or hiring new staff) and in the course of the program (e.g., transaction costs). Similar to Rooks



(2010), we considered both cost components in asking respondents whether they had made investments or hired new personnel before entering the program and also requested information regarding the perceived bureaucratic and administrative efforts linked to the program (Rooks and Matzat 2010). To measure social embeddedness, we relied on variables adopted from the literature, such as commitment (Magazine et al. 1996; Wilson 1995; Meyer and Allen 1991), subjective norms (Ajzen 2002; Lechler 2001), and the strength of the relationship with the school as well as the existence of a shared system (Li 2012; Cohen and Prusak 2001; Wilson 1995). To capture the role of conflicts in the buyer-supplier relationship, questions regarding the coordination level and conflict resolution (Lechler 2001) were used. The suppliers' opinion regarding SFS's effects on child nutrition was also determined from the questionnaire.

### **3 Results**

The results reveal that overall, suppliers slightly tend to intensify their participation in the SFS. The mean of the multi-item variable PART is 3.46 on a 5-point scale (see Table 2). Subsequent analysis was performed in two steps. A factor analysis was used to extract relevant factors that explain PART, followed by a linear regression analysis to test the hypotheses derived above.

#### **3.1 Factor analysis**

A principal component analysis with varimax rotation was performed. The number of factors was determined by a scree test. All factors in this study had an eigenvalue greater than 1 (Kaiser-Guttman criterion).

<<Table 3>>

Table 2 presents the factor analysis results for each construct involved in this study. In terms of the reliability analysis, the factor loading for each item was greater than 0.5, and Cronbach's coefficient alpha for each extracted factor was larger than 0.5 (Churchill 1979; George and Mallery 2003). Furthermore, the Kaiser-Meyer-Olkin value, calculated at around 0.6 or higher, was acceptable. Additionally, the Bartlett test of sphericity was significant for all factors, which is an additional requirement for the suitability of data for factor analysis. Variables with negative factor loadings were reverted for a distortion test. However, there were no significant changes in



the results of the factor analysis and the regression model, implying that the original results were still valid. The individual items with their allocation to each factor are shown in Table 2.

### 3.2 Regression analysis

Multiple linear regression analysis was used to examine the influence of social embeddedness, performance, and costs on suppliers' SFS participation intensity. In total, four models were estimated. Model 1 (M1) combines all factors from Table 3. Models 2 to 4 were extended by the suppliers' belief of child nutrition improvement by the SFS (M2), the amount of F&V served in the SFS framework (M3), and the annual turnover and number of employees (M4). Standardized regression coefficients were used for model comparison. According to an F-test conducted, all models were significant overall and no serious violations were found in the plots of standardized residuals as compared to the predicted values and the normal probability plots of standardized residuals. This implies that residuals were normally distributed. The result of the regression analysis is shown in Table 4. The adjusted  $R^2$  ranges between 0.215 (M1) and 0.252 (M3). The variance inflation factor was calculated in all cases to avoid multicollinearity between the independent variables of the models. To verify these results, a correlation matrix of all factors and additional variables was calculated. With the exception of the correlation between the annual turnover and the number of employees (0.42;  $p < 0.01$ ), all regression coefficients are much lower than 0.4, indicating no substantial multicollinearity in the independent variables. Furthermore, a correlation analysis could reveal relationship patterns between supplier characteristics. For instance, financial performance correlates negatively with company size (-0.35 for turnover as against -0.30 for employees;  $p < 0.01$ ). Regarding financial performance and business focus, they are in point biserial correlation with farms/farm-shops (0.23;  $p < 0.05$ ), greengrocers (0.20;  $p < 0.05$ ), and supermarkets (-0.29;  $p < 0.01$ ). Point biserial is used because of the categorical scale business focus variables.

#### <<Table 4>>

##### 3.2.1 The influence of performance on supplier's PART

Both financial performance and entrepreneurial performance have a significant influence ( $p \leq 0.01$ ) on PART in all models. With respect to the beta coefficients (Table 4), the effect of financial performance is slightly stronger compared to entrepreneurial performance.



Surprisingly, the amount of F&V served (which indicates the SFS turnover), the number of employees, and the annual turnover do not influence PART. Thus, H1a and H1b are partially supported.

### 3.2.2 The influence of costs, level of competition, and child nutrition on supplier's PART

Monetary costs, such as investments and new staff (INV), do not show a significant influence on PART. Similarly, the level of perceived (unfair) competition has no significant impact. Transaction costs, however, significantly reduce PART in all models ( $p \leq 0.1$ ). Therefore, H2a and H2c are rejected, while H2b is supported. In addition, the suppliers' conviction about improvement in child nutrition influences PART positively in M2–M4. Therefore, H3 is supported, too.

### 3.2.3 The influence of social embeddedness on supplier's PART

We tested H4a and H4b with models M1–M4, and H3c with M2–M4. All models show similar results for these hypotheses. Although the general social embeddedness has a positive influence on PART ( $p \leq 0.01$ ), conflicts in the buyer-supplier relationship have no significant influence. Therefore, H3a is supported, but H3b is disproved.

## 4 Discussion

The purpose of this research was to determine the influence of social embeddedness, performance, and costs on supplier's SFS participation intensity. Several key insights emerge from the results. The identified factors correspond to the theory. Overall,  $R^2$  value indicates that approximately 25% of the variance is explained by the model. These are rather satisfactory results for a cross-sectional enterprise-based study. However, we could not integrate all predicted variables in the models. The variety in the types of companies and social relationships must also be taken into account.

The results mostly correspond to as well as complement the theoretical assumptions. Thus, the reasons for SFS participation are multifaceted, as in US studies of farm-to-school programs (Conner et al. 2012; Izumi et al. 2010a; Izumi et al. 2010b). In the estimated models, the financial aspect was determined as the most influential single factor that could be inferred from a neo-classical view. Contrary to qualitative case studies that suggest that this aspect is of rather

minor importance, the results support those studies that identified at least subgroups with a distinctive financial motivation (Conner et al. 2012). We could detect no influence of a subjective perception of competition on PART. However, entrepreneurial performance, which consists of competitive success factors, contributes significantly to PART. Therefore, it could be helpful to relate subjective statements to facts about competitors within a specific radius. Further studies would find it interesting to take a closer look at the determinants of economic success. Besides the business-driven determinants, the buyer-supplier relationship is clearly shown to have a significant influence on PART and the social motivation for the promotion of child nutrition. The more suppliers are embedded in the social system of customers, the more they are willing to intensify participation.

This study does not claim to separate motivations or even suppliers into “good” or “bad” clusters or to identify successful ones. Rather, it indicates that success in food networks should be interpreted in a different way, depending on the company’s individual situation (Haber and Reichel 2005; Reijonen 2008; Paige and Littrell 2002; Toledo-López et al. 2012). Furthermore, these programs were initiated, among other things, to strengthen the viability of local and often small-scale agricultural production systems (Bagdonis et al. 2009; Vogt and Kaiser 2008). The high share of micro and small-sized enterprises as well as farms and farm shops in the sample indicates that the SFS can be attractive to these groups.

## 5 Conclusion

We found evidence that social embeddedness has an effect on PART. Therefore, the aim should be to achieve a close buyer-supplier relationship. However, treating each other with kid gloves is not necessary. Results show that conflicts between trading partners should not generally be ignored. Although the SFS pursues a social objective without price competition in other fields, a certain entrepreneurial performance is required considering that it operates under market economy conditions. Even though suppliers’ commitment to child nutrition improvement has a positive impact on PART, financial success is at least equally important. This explains why decision makers should establish an economically profitable framework without excessive transaction costs. In fact, financial performance plays a central role, but the amount of F&V served has no significant effect. Nevertheless, a latent connection between individual variables—



which could not be determined because of the relatively small population with less than 150 suppliers—could influence the results. Regarding the special situation of the SFS, the results show that the program is very well suited to small and medium-sized companies where even a few customers can generate a significant share of the companies' overall sales. However, the approach in a restricted area of Germany cannot automatically generate conclusion about the situation in the EU, considering that the EU area is much more diverse in terms of agricultural practices than the US. From the viewpoint of further studies, a closer look at other countries as well as the determinants of economic success could offer interesting insights. Research on different forms of implementation in other countries could generate interesting results toward identifying the framework that is most appropriate for promotion of the local economy. Simultaneously, it would be desirable if the economic objective of the SFS is described as precisely as the aim of increasing children's F&V consumption.

### **Acknowledgments**

This paper derives from a research project funded by the state government of North Rhine-Westphalia and the European Union.

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**Table 1. Size classes of enterprises**

Employees/Turnover in €	<10	<50	<250	<500	>500
<250K	19	1	1	0	0
<500K	14	0	0	0	0
<1 mio	13	2	0	0	0
<2 mio	8	9	0	0	0
<10 mio	2	20	1	0	0
<50 mio	0	2	3	0	0
>50 mio	0	0	0	1	0

The gray scaled parts correspond to the categories of micro (light gray), small (medium gray) and medium-sized (dark gray) enterprises in the European Commission recommendation 2003/361/EC; n = 96 (since 3 of the 99 initial firms have missing values for turnover)



Table 2. Descriptive statistics of the variables

Label	Content of variable	Mean	S.D.	Adapted from
PART	$PART = \frac{\sum_{i=1}^5 PART_i}{5}$	3.46	0.60	
PART1	I will definitely continue to participate in the SFS.*	4.68	0.71	
PART2	<b>R*</b> Sometimes, I consider stopping my activities in the SFS.*	4.21	1.37	
PART3	<b>R*</b> In retrospect, I would not participate in the school fruit program again.*	4.69	0.85	
PART4	For the SFS, I would reduce my efforts in other business areas.*	1.49	1.00	
PART5	According to your experience, what are your future activities in the SFS?***	3.79	0.90	
FP1	How sharply did your sales increase by the SFS?****	2.40	1.02	(Li 2012; Low and Cheng 2006)
FP2	How sharply did your profit increase by the SFS?****	1.96	0.97	(Li 2012; Low and Cheng 2006)
FP3	How sharply did your planning security increase by the guaranteed offtake in the SFS?****	2.25	1.35	(Li 2012; Low and Cheng 2006)
EP1	Compared to other competitors my delivery performance is smoother.*	3.80	0.99	(Prahinski and Benton 2004)
EP2	Compared to other competitors my performance in responsiveness to requests for changes is better and faster.*	4.14	0.98	(Prahinski and Benton 2004)
EP3	Compared to other competitors my service support is outstanding.*	4.33	0.83	(Prahinski and Benton 2004)
COM1	Some suppliers actively try to poach schools.*	2.49	1.57	
COM2	Some companies work with unfair practices.*	2.57	1.43	
COM3	When new schools are announced, many suppliers pounce on them.*	3.14	1.64	
COM4	In my school fruit area, I feel no competition between suppliers.*	3.71	1.54	
INV1	Extra investments were necessary for the SFS (e.g. new equipment).*	1.93	1.49	(Rooks et al. 2000)
INV2	Hiring new staff for the SFS was necessary.*	1.94	1.60	(Rooks et al. 2000)
TC1	To me, the SFS is too bureaucratic.*	3.42	1.44	
TC2	<b>R*</b> The amount of time I have to invest in the administration of the SFS corresponds more or less to the expenditure of time in comparable businesses* (1 = lower; 5 = higher).	3.84	1.39	(Rooks and Matzat 2010)
SE1	I enjoy talking to others about the SFS and the working relationship with the schools.*	4.33	1.05	(Magazine et al. 1996; Meyer and Allen 1991)
SE2	People whose opinion is important to me think positive about my participation in the SFS.*	4.67	0.71	(Ajzen 2002)
SE3	I would be sad indeed if the cooperation with the schools ends some day.*	4.71	0.79	(Magazine et al. 1996; Meyer and Allen 1991)
SE4	It is important for me to show to the outside world that I support the society.*	4.10	1.28	(Ajzen 2002)
SE5	I share my information openly with the schools.*	4.74	0.69	(Li 2012; Cohen and Prusak 2001)
SE6	To sum up, I have a close relationship with my schools.*	3.88	1.27	(Li 2012; Cohen and Prusak 2001)
CON1	It is not easy to agree upon the tasks between the school and me.*	1.67	1.18	(Lechler 2001)
CON2	If disagreements arise, it is hard to find a solution to our mutual satisfaction.*	1.33	0.73	(Lechler 2001)
CON3	The schools are only interested in their own problems, so there remains little time to handle the SFS.*	2.33	1.55	(Lechler 2001)
CON4	The schools hardly acknowledge me or my products.*	1.53	1.01	
CN	Child nutrition has improved with the SFS.*	4.27	0.79	
T	Annual turnover****	3.27	1.66	
S	Number of served schools; N (min 1; max 57)	7.45	10.27	
E	Number of employees; N (min 1; max 250)	19.05	37.32	

n=99; \* 1 (does not apply at all) to 5 (fully applies)\*\* 1 (I intend to significantly scale back my activities) to 5 (I intend to significantly increase my activities); \*\*\* 1 (not at all) to 5 (very sharply); \*\*\*\* 1 (<250 000 €) to 7 (>50 mio €; n = 96); PART = intensity of participation; SE = social embeddedness; COM = competition; FP = financial performance; CON = conflicts in buyer-supplier relationship; NFP = non-financial performance; INV = investments; TC = transaction costs; CN = children's nutrition; T = turnover; S = number of schools; E = number of employees; **R\*** = item has been reverted in order to align with the scale of the other variables



**Table 3. Factor analysis for each construct**

Label	Research construct	Research items	Number of items	Eigenvalues	Factor loadings (absolute values)	Cronbach's alpha
FP	Performance	Financial performance	3	2.379	0.762–0.809	0.8
EP		Entrepreneurial performance	3	1.785	0.729–0.834	0.7
COM		Competition	4	2.882	0.582–0.825	0.8
INV	Costs	Investments	2	1.309	0.744–0.829	0.7
TC		Transaction costs	2	1.106	0.784–0.793	0.7
SE	Buyer-supplier relationship	Social embeddedness	6	4.274	0.538–0.781	0.7
CON		Conflicts in buyer-supplier relationship	4	1.978	0.563–0.856	0.7

**Table 4. The influence on the intensity of participation in the SFS (dependent variable)**

	M1	M2	M3	M4
Financial performance (FP)	0.318***	0.286**	0.244**	0.268**
Entrepreneurial performance (EP)	0.284***	0.261***	0.247***	0.261***
Competition (COM)	n.s.	n.s.	n.s.	n.s.
Investments (INV)	n.s.	n.s.	n.s.	n.s.
Transaction costs (TC)	-0.172*	-0.150*	-0.157*	-0.163*
Social embeddedness (SE)	0.233***	0.232***	0.235***	0.198***
Conflicts in buyer-supplier relationship (CON)	n.s.	n.s.	n.s.	n.s.
Improving children's nutrition (CN)		0.171**	0.185**	0.211**
Amount of F&V served (S)			n.s.	n.s.
Number of employees (E)				n.s.
Company's turnover (T)				n.s.
d (Durbin-Watson)	1.970	1.938	2.022	2.164
R <sup>2</sup>	0.271	0.297	0.323	0.338
adj. R <sup>2</sup>	0.215	0.234	0.252	0.249
F	4.824	4.744	4.603	3.805
p	0.000	0.000	0.000	0.000

Standardized coefficients; \*\*\*p ≤ 0.01; \*\*p ≤ 0.05; \*p ≤ 0.1