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# Internationalization and Firm Performance in Agribusiness: Empirical Evidence from European Cooperatives

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Received January 2011, accepted July 2011, available online September 2011

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## ABSTRACT

The ongoing internationalization of markets has become a major issue also for companies of the agribusiness. Nevertheless, neither the degree of internationalization of agribusiness firms nor the internationalization-performance relationship in the agribusiness sector have been analyzed thoroughly so far. To help fill this void, we use panel data compiled from annual reports and balance sheets to investigate the internationalization as well as the internationalization-performance relationship of 21 leading European cooperatives in the dairy and meat sectors. Our results indicate that internationalization has a significant positive impact on firm performance.

*Keywords: internationalization, firm performance, cooperatives, dairy industry, meat industry*

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## 1 Introduction

Today, companies face increasing globalization, shortened product lifecycles and growing R&D and marketing investments as well as low growth rates and intense competition on their domestic markets. Against this background, internationalization has become a major issue for companies if they wish to maintain their competitiveness and develop new growth opportunities (Horvath, 1989; KUTSCHER and SCHMID, 2008). In recent years this development has also affected the agribusiness sector.

Nevertheless, despite the ongoing globalization that is ubiquitous in almost every industry sector and a growing number of multinational companies, the relationship between internationalization and firm performance still provokes controversy in the literature. Although various empirical studies deal with the subject of internationalization (for an overview see, for instance, LI, 2007 or Glaum and Oesterle, 2007), their results are ambiguous, and only a few studies focus on the agribusiness sector (e.g., THEUVSEN and EBNETH, 2005; Guillouzo and Ruffio, 2005; Ebneth and Theuvsen, 2007). Therefore, neither the degree of internationalization of agribusiness firms nor the internationalization-performance relationship in the agribusiness sector have been analyzed thoroughly. To help fill this void, we use panel data compiled from annual reports and balance sheets to investigate the internationalization as well as the internationalization-performance relationship of 21 leading European cooperatives in the dairy and meat sectors.

This paper is organized as follows: After the introduction we give an overview of the literature concerning the internationalization-performance relationship. In section 3 we introduce our sample and the methodology applied. Empirical results are presented in section 4. First, we analyze the degree of internationalization by combining the Foreign Sales Index and the Network Spread Index (IETTO-GILLIES, 1998) into one measure as suggested by EBNETH (2006). Next, we calculate selected key financial figures of the companies in our sample in order to obtain in-depth insights into the internationalization-performance relationship in the agribusiness.

We also apply multivariate statistics (panel data analysis using GRET) in order to shed more light on the relationship between degree of internationalization and firm performance in agribusiness. Finally, in section 5 we discuss our findings and conclude with some remarks concerning internationalization in the agribusiness sector.

## 2 Internationalization and firm performance

Whether there is a systematic relationship between the internationalization of firms and their performance is a central question in the field of (international) management. Over the years a number of scientists have examined the effects of internationalization on firm performance from various theoretical perspectives.

Besides the industrial economics perspective with its strong focus on economies of scale and scope as well as learning curve effects (Grant, 1987; Hitt et al., 1997; Hennart, 2007), expectations of a positive relationship stem mainly from the resource-based view in strategic management (Grant, 1991; Annavarjula and Beldona, 2000). According to this perspective, inimitable resources (technical knowledge, brands, highly skilled employees, etc.) developed on domestic markets can create competitive advantages on foreign markets as well (Morck and Yeung, 1991; Delios and Beamish, 1999; Lu and Beamish, 2004). Moreover, the flexibility of organizations due to internationalization (Allen and Pantzalis, 1996) is seen positively, because organizations might use arbitrage potentials on different markets in order to gain higher profits; this kind of flexibility also better equips firms to react to changing domestic markets (Kim et al., 1993; Allen and Pantzalis, 1996; Capar and Kotabe, 2003; Bausch and Krist, 2007) and could lead to higher levels of information (Ghoshal, 1987). Furthermore, portfolio theory supports positive internationalization-performance relationships since it enables companies to minimize their risks and increase profits by becoming active on markets that differ from their domestic markets in terms of market dynamics and development (Reeb et al., 1998; Annavarjula and Beldona, 2000; Hennart, 2007; Oesterle and Richta, 2009). Risks that might be relevant in this context are mainly fluctuations in the fields of customer demand, turnover, and prices on factor markets as well as changes in the political environment (Kim et al., 1989; Riahi-Belkaoui, 1998; Hsu and Boggs, 2003). Another argument in favour of higher levels of internationalization is the aspect of organizational learning. Companies with subsidiaries in foreign countries are able to acquire diverse information, which enables them to generate competitive advantages compared to competitors that have restricted their business activities to the domestic market in their home countries and, therefore, have a more limited access to relevant knowledge (Ghoshal, 1987; Kogut and Zander, 1993; Oesterle and Richta, 2009).

In contrast, there are also arguments for negative effects of internationalization on firm performance, such as increasing coordination and controlling costs (Gomes and Ramaswamy, 1999; Goerzen and Beamish, 2003; Denis et al., 2002). Furthermore, foreign companies may, at least at the beginning of their international activities, be at a competitive disadvantage against well-established companies due to lack of information regarding local demand conditions (Barkema et al., 1996; O'Grady and Lane, 1996; Zaheer and Mosakowski, 1997). Reeb et al. (1998) emphasize assessing the risks of international business activities as a net effect of opportunities and threats.

Since there are arguments both in favour of and against internationalization, over the years a great number of empirical studies based on various methods have dealt with the subject of internationalization and sought to answer the question of whether the relationship between internationalization and firm performance is positive or negative (Glaum and Oesterle, 2007; Li, 2007; Oesterle and Richta, 2009). Nevertheless, the empirical results have been ambiguous and findings sometimes seem contradictory. The major findings can be summarized as follows:

- **Positive linear relationship:** Higher levels of internationalization are associated with positive returns (Vernon, 1971; Bühner, 1987; Grant, 1987; Kim et al., 1993; Delios and Beamish, 1999; Zahra et al., 2000; Annavarjula et al., 2005).
- **Negative linear relationship:** Higher levels of internationalization are associated with negative returns (Siddharthan and Lall, 1982; Michel and Shaked, 1986).
- **Inexistent or not significant relationship:** Internationalization and performance do not correlate significantly (Severn and Laurence, 1974; Kumar, 1984; Dunning, 1985; Rugman et al., 1985; Yoshihara, 1985).
- **U-Curve:** The relationship between internationalization and performance is non-linear and results in a U-curve (Lu and Beamish, 2001; Capar and Kotabe, 2003; Ruigrok and Wagner, 2003). Using organizational learning theory, Ruigrok and Wagner (2003) find that firms initially experience negative performance when

expanding internationally due to the costs of foreignness. However, as firms learn from their international experience, their performance becomes positive (Thomas and Eden, 2004).

- **Inverted U-Curve:** Other scholars also find the relationship between internationalization and performance to be non-linear but to result in an inverted U-curve (Daniels and Bracker, 1989; Geringer et al. 1989; Hitt et al., 1997; Gomes and Ramaswamy, 1999; Li and Qian, 2005). Inverted U-shaped relationships can be explained by the incremental model developed by the Uppsala school (Johanson and Vahlne, 1977) which postulates that internationalization starts on geographically adjacent countries, where the business environment is more familiar to firms, and returns are likely to be positive. When entering into more complex markets, firms begin to face managerial difficulties that end up in compromising returns. Therefore, in the end the marginal cost of international expansion will exceed the marginal benefits and jeopardise firm performance (Li, 2007).

- **S-Curve Hypothesis:** Recently, attempting to combine the findings resulting in inverted U- and U-shaped relationships, other studies tested and found support for a horizontal S-shaped relationship (Sullivan, 1994; Contractor et al., 2003; Lu and Beamish, 2004; Li, 2005). Furthermore, Contractor (2007) found that the results of over one hundred empirical studies seem contradictory only on superficial examination. These results can be aligned with the S-curve hypothesis, according to which internationalization produces positive returns up to a certain level of investment in international operations, i.e. as long as the degree of internationalization (see section 3.2.1) does not exceed a critical threshold. After that point, i.e. if the degree of internationalization further increases, there is an increase in managerial costs, and the marginal product of internationalization becomes negative. Thus, there is a dynamic interplay between the costs and the benefits of internationalization, so the resulting relationship with performance is a cyclical S-curve. Thus, the S-curve hypothesis helps to explain some of the, at first sight, contradictory empirical findings in the international management literature by referring to the degree of internationalization as an important determinant of the internationalization-performance-relationship.

The vast majority of studies that have examined the relationship between internationalization and firm performance analyzed multinational firms from developed countries (mainly the USA, Germany, the UK and Japan). Most of these studies have analyzed samples that comprise enterprises from diverse industry sectors with the outcome that their results are heterogeneous and sometimes contradictory (Li, 2007; Glaum and Oesterle, 2007). Against this background and since so far the internationalization-performance relationship has only rarely been analyzed for agribusiness firms, it becomes obvious that further research is needed. In response, the present study investigates the nature of the relationship between internationalization and performance for firms located in the agribusiness sector.

### 3 Methodology

#### 3.1 Sample

Hennart (2007), Li (2007) and Delios and Beamish (1999) point out that the internationalization-firm performance relationship should be analyzed at a detailed industry level in order to separate the impact of internationalization on performance from other spurious effects. Consequently, the sample consists of 21 leading European dairy (14) and meat (7) cooperatives derived from the NICE European Agrifood Cooperative Top 100 List (Van Bekkum, 2007) and ranked by turnover in the year 2009. Although our sample is heterogeneous regarding firm sizes (with turnovers from very large companies such as Vion with almost € 9 billion as well as medium-sized companies such as Tican with about € 500 million), the companies within our sample are all cooperatives or at least “farmer-owned businesses”. They are at least somewhat active on international markets and situated in related subsectors of the agribusiness (e.g. both sectors are resource-intensive and mainly process animal raw materials that are purchased from their associated farmer suppliers).

**Table 1.**  
Sample of 21 leading European dairy and meat cooperatives

Company	Country	Turnover in € million				
		2005	2006	2007	2008	2009
<b>Dairy Cooperatives</b>						
FrieslandCampina <sup>1</sup>	NL	n.a.	n.a.	9,008	9,454	8,160
Arla Foods	DK/SE	6,220	6,099	6,408	6,635	6,209
Sodiaal	FR	n.a.	n.a.	n.a.	2,746	2,486
Tine	NO	1,781	1,860	1,939	2,102	2,123
Nordmilch	DE	2,031	1,941	2,341	2,521	1,862
Glanbia	IE	1,830	1,853	2,207	2,232	1,830
Irish Dairy Board	IE	1,976	2,074	2,111	2,090	1,823
Valio	FI	1,579	1,621	1,713	1,843	1,787
Emmi	CH	1,309	1,485	1,523	1,697	1,735
Humana Milchunion	DE	1,798	1,848	2,156	2,186	1,693
Hochwald	DE	1,030	1,070	1,188	1,252	1,058
Granarolo	IT	890	908	932	967	900
Milk Link <sup>2</sup>	GB	840	747	764	687	617
Milch-Union Hocheifel	DE	448	462	548	619	528
<b>Meat Cooperatives</b>						
Vion	NL	6,221	7,341	6,996	8,540	8,988
Danish Crown <sup>3</sup>	DK	6,522	6,507	5,952	6,300	6,012
HK Scan	FI	883	934	2,107	2,295	2,125
Westfleisch	DE	1,599	1,666	1,684	2,009	1,887
Nortura	NO	1,290	1,628	1,738	1,802	1,751
Atria	FI	977	1,103	1,272	1,357	1,316
Tican <sup>3</sup>	DK	345	407	497	569	498
<sup>1</sup> merged 31.12.08						
<sup>2</sup> financial year ending March						
<sup>3</sup> financial year ending September						

Source: Company data, authors' calculations

The research period comprises the last five financial years (2005-2009). Data collection was done on an annual basis, extracted from annual reports. All financial figures are disclosed in Euros as most companies report their annual results in the common European currency. All other currencies have been converted into Euros using annual average exchange rates. Therefore, our sample from the agribusiness subsectors dairy and meat processing provides comparable data to the required extent.

### 3.2 Variables and analytic method

#### 3.2.1 Measuring the Degree of Internationalization

To measure the internationalization-performance relationship of an enterprise, it is at first necessary to determine the degree of internationalization. The latter describes to what extent an enterprise is integrated into international business activities (Scherm and Süß, 2001). The most common ways of measuring the degree of internationalization are one-dimensional measures such as the ratio of foreign sales to total sales, the share of foreign assets to total assets (Reeb et al., 1998), the ratio of foreign pre-tax income to total pre-tax income (Chen et al., 1997), the number of countries with foreign operations and the shares of foreign employees, profits, value added or shareholders (Fisch and Oesterle, 2003). All the above measures have in common that they seek to capture the depth of internationalization. In current studies, sales-based internationalization indicators are by far most prevalent (Li, 2007). With this in mind and due to data availability, in this study we employed foreign sales to total sales ratio or, in other words, the foreign sales index (FSI) in order to analyze the depth of internationalization.

Moreover, there are some studies that investigate the scope or breadth of internationalization by examining the geographic dispersion of operations across countries (Kogut, 1985; Hsu and Boggs, 2003). Therefore, the current study also adopts a further internationalization index to cover the international dispersion of cooperatives' subsidiaries. The so-called Network Spread Index (NSI) is calculated by dividing the number of countries in which an enterprise maintains subsidiaries by the total number of countries

that received direct investments in 2007 (letto-Gillies, 1998). Thus, this paper uses 174 as the denominator because this is the number of countries identified as relevant recipients of direct investments in the year 2007 by the Doing Business Project of the World Bank minus one to correct for the country of origin (World Bank, 2007).

Nevertheless, the FSI as well as the NSI remain single-item measurements and do not fully explain the multi-dimensionality of internationalization (Glaum and Oesterle, 2007). For this reason and due to the constraints that result from the low disclosure requirements of cooperatives that complicate the use of more sophisticated measures, we apply a combination of two concepts for measuring the degree of internationalization. In doing so, we follow Ebneith (2006), who suggests combining the Foreign Sales Index (FSI) and the Network Spread Index (NSI) (letto-Gillies, 1998) into one measure by building the Degree of Internationalization (DOI). Therefore, the following internationalization measures are applied in this paper:

(1) *Foreign Sales Index (FSI)*: Ratio of foreign sales to total sales.

(2) *Network Spread Index (NSI)* with 
$$NSI = \frac{n}{n^*}$$

$n, n^*$  = Number of countries where a company owns fully consolidated subsidiaries ( $n$ ) or could possibly own subsidiaries ( $n^*$ ). This paper employs  $n^* = 174$  because this is the number of countries that have been identified as relevant recipients of direct investments by the Doing Business Project of the World Bank (World Bank, 2007).

(3) *Degree of Internationalization (DOI)* = 
$$\frac{(FSI+NSI)}{2}$$

### 3.2.2 Measuring Financial Performance

Cooperatives play an important role in the meat and dairy industries as well as in many other food industries in Europe (Theuvsen and Ebneith, 2005; Hendrikse, 2006). Without doubt, cooperatives typically pursue goals other than profit maximization, including, but not necessarily restricted to, the support of their members and creating membership value (Beuthien et al., 2008; Blome-Drees, 2008). Despite this broader goal system of cooperatives, the remainder of this study is restricted to an analysis of the internationalization-financial performance relationship for three reasons: First, the relationship between degree of internationalization and goals other than profit maximization has not been analyzed so far. Therefore, neither theoretical arguments nor empirical findings exist that could underpin such an analysis. Second, the food industry in Europe has been characterized by high intensity of competition for decades. This limits cooperatives' ability to pursue goals other than profit maximization. And third, some of the cooperatives in our study have transformed into "farmer-owned businesses" by separating their cooperative sphere from their daily business operations. The latter are often managed in a way very similar to a private, investor-owned company.

In the literature concerning the internationalization-performance relationship, many ways to measure firm performance are proposed (Oesterle and Richta, 2009). The suggested measures can be divided mainly into capital market-based figures (e.g., Tobin's Q or the Shareholder Value) and accounting-based measures (e.g., Return on Equity or Return on Investment) (Ebneith, 2006). Only the latter is applicable in the cooperative sector. Since we analyze the annual reports of cooperatives in our study, it is necessary to find an adequate profitability measure that can be derived from balance sheets and is comparable on an international basis. Therefore, we calculated (I) the EBIT (Earnings before Interest and Taxes) for the cooperatives in our sample. By adding taxes and interest back to the net income, EBIT eliminates to some extent the influence of different concepts of financing and taxation and, therefore, improves international comparability of firm data (Coenberg, 2005). Nonetheless, the literature also discusses different approaches for measuring the performance of cooperatives (for example, measuring the membership value) (Kramer, 2005). However, since most of the cooperatives in our sample, have outsourced their operating business activities to corporations and act as holding cooperatives for these firms, we employ traditional financial key figures (Beuthien, 1996).

Since we are comparing companies of different sizes over time, it is useful to set the EBIT in relation to an input value (Baetge et al., 2004). Thus, we calculated the following ratios:

(II) Return on Assets = 
$$\frac{\text{EBIT}}{\text{Average Total Assets}}$$

By dividing the EBIT through the average total assets, the Return on Assets (ROA) represents the interest yield of the average total assets (Peemöller, 2003). Therefore, the capital structure does not have any influence on this financial key figure which allows certain comparability. (Küting and Weber, 2009) It has often been used in previous studies concerning the internationalization-performance relationship (Daniels and Bracker, 1989; Haar, 1989; Ramaswamy, 1995; Gomes and Ramaswamy, 1999).

As a third financial performance indicator, we calculated Return on Sales (ROS) as follows:

$$(III) \text{ Return on Sales} = \frac{\text{EBIT}}{\text{Total Sales}}$$

Return on Sales has also often been used in previous studies (Vernon, 1971; Dunning, 1985; Li and Qian, 2005). It is used to evaluate the operational efficiency of a company since it shows the profit earned per unit of turnover. Additionally, using sales-based measures avoids the effects of different asset valuations resulting from new investments and depreciation (Geringer et al., 1989).

### 3.2.3 Measurement Model

To combine the results for the Degree of Internationalization and the performance indicators, we are able to make use of our panel data set, which enables 20 observations for every year of the five-year research period. Nevertheless, due to data availability, we could not obtain data for every cooperative in every year. Therefore, our data set reflects a so-called unbalanced panel. In order to test the potential internationalization–firm performance relationship in the cooperative dairy and meat sector, we apply a fixed effects model using the statistics program GRET. Fixed effects regression is used to control for omitted variables in panel data when the omitted variables vary across entities but do not change over time (Stock and Watson, 2007). Thus, by introducing entity fixed effects, we control for variables, such as corporate culture or the attitude of management towards the internationalization process, that are firm-specific but at least in some way constant over the observed time period. Additionally, we apply time fixed effects to control for variables that are constant across the observed cooperatives but change over time (e.g., the global milk price for the dairy cooperatives).

Due to the fact that the entity and time fixed regression model cannot control for omitted variables that vary both across entities and over time, we integrate two additional control variables: (a) firm size and (b) size of the domestic market. By this means, we are able to control for other factors that could also have an influence on firm performance.

Previous studies indicate that a firm’s size is often related to its performance (Grant et al., 1988; Buckley et al., 1977). Therefore, in our study, firm size is measured by the natural logarithm of total sales and used to control for economies and diseconomies of scale at the corporate level (Contractor et al., 2003). It is also possible that companies from small countries with small markets are more successful in the internationalization process since internationalization is their only way to realize growth. To assess the size of the domestic market, the natural logarithm of the number of inhabitants in a company’s home country was taken as a proxy. The number of inhabitants was derived from the data bank of the World Bank Group (World Bank, 2011)

## 4 Empirical Results

### 4.1 Progress in Degree of Internationalization

By analyzing the levels of internationalization we identify tremendous differences between individual cooperatives.

#### Dairy Cooperatives

Regarding the FSI for the dairy cooperatives, results are very heterogeneous. The FSI ranges from 2.31 % (Milk Link) to 72.45 % (FrieslandCampina) in the year 2009\*. Interestingly, the largest company in the

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\* The Irish Dairy Board constantly has a FSI of 100 % due to the fact that the IDB was founded to solely export Irish dairy products.

sample, measured by turnover, (FrieslandCampina) shows the highest share of foreign sales to total sales. Notwithstanding, Milchunion Hocheifel, the smallest company in our sample, also achieves a high percentage (40.28 % in 2009) of sales on foreign markets. Concerning the development of the FSI of individual dairy cooperatives, there are only slight changes over the years. Their average FSI grew slightly from 34.47 % in 2005 to 38.80 % in 2009. It is not known whether these small changes may even stem from changes in foreign exchange rates rather than from a clear strategy towards greater internationalization of the European dairy cooperatives.

As for the FSI, we also find heterogeneous results for the NSI of the dairy cooperatives ranging from no foreign direct investments (Milk Link) to a NSI of 12.64 % (FrieslandCampina) in 2009, which indicates subsidiaries in 22 countries. It is worth noting that we did not make a distinction as to whether the subsidiary is a manufacturing company or just a sales company. Therefore, we are not able to assess the involvement of the parent company in the foreign country. The average NSI rose slightly from 2.99 % in 2005 to 3.80 % in 2009. Thus, in 2009 the dairy cooperatives in our sample had subsidiaries in 6.61 countries on average.

### **Meat Cooperatives**

Concerning the ratio of foreign sales to total sales in 2009, we also find heterogeneous results for the meat cooperatives in our sample, ranging from 3.24 % (Nortura) to 89.45 % (Vion). Just as with the dairy cooperatives, there are only slight changes within the FSI of the individual meat cooperatives, with one exception: HK Scan acquired the operating business units of Swedish Meats in 2007 and, therefore, shows a strong increase in its FSI. HK Scan achieved 68.51 % of its sales abroad in 2007 compared to 35.19 % one year earlier. During the research period, for all meat cooperatives in our sample, the average FSI rose from 50.98 % in 2005 to 58.40 % in 2009. Hence, the FSI of the leading European meat cooperatives is significantly greater than the average FSI of the dairy cooperatives.

Concerning the NSI, the number of countries where the meat cooperatives have subsidiaries ranges from 1 (Nortura) to 30 (Vion) countries (NSI 0.57 % to 17.24 %) in 2009. For all meat cooperatives, the average NSI rose from 3.07 % in 2005 to 6.24 % in 2009 and is therefore also slightly higher than the average NSI of the dairy cooperatives. Thus, on average the meat cooperatives in our sample had subsidiaries in 10.86 countries in 2009.

Table 2 shows the results for the Foreign Sales Index and the Network Spread Index for the dairy and meat cooperatives in our sample. The cooperatives are sorted by turnover in the year 2009.



**Table 2.**  
Development of FSI and NSI

Company	Foreign Sales Index (%)					Network Spread Index (%)				
	2005	2006	2007	2008	2009	2005	2006	2007	2008	2009
<b>Dairy Cooperatives</b>										
FrieslandCampina <sup>1</sup> (NL)	n.a.	n.a.	70.71	70.40	72.45	n.a.	n.a.	14.37	14.37	12.64
Arla Foods (DK/SE)	59.94	60.22	61.45	60.17	61.38	9.77	10.92	11.49	10.34	10.34
Sodiaal (FR)	n.a.	n.a.	n.a.	14.97	14.16	n.a.	n.a.	n.a.	2.30	2.30
Tine (NO)	11.77	12.30	12.92	13.35	15.12	2.30	2.30	2.30	2.30	2.30
Nordmilch (DE)	31.28	29.93	31.78	27.10	29.86	n.a.	0.00	0.57	0.00	0.00
Glanbia (IE)	59.83	58.16	63.59	66.71	n.a.	2.87	2.87	4.60	4.60	4.60
Irish Dairy Board (IE)	100	100	100	100	100	2.87	2.87	2.87	2.87	2.87
Valio (FI)	33.16	33.68	34.80	30.00	31.01	5.17	5.17	5.17	4.60	4.60
Emmi (CH)	21.92	21.80	23.47	23.21	25.78	4.60	5.75	5.75	6.32	6.32
Humana Milchunion (DE)	28.14	28.68	27.55	24.52	n.a.	1.72	1.72	1.72	1.72	n.a.
Hochwald (DE)	26.09	34.76	34.88	33.82	34.48	0.57	1.15	1.15	1.15	1.15
Granarolo (IT)	2.33	2.21	2.00	n.a.	n.a.	0.00	0.57	0.57	0.57	0.57
Milk Link <sup>2</sup> (GB)	4.65	6.04	4.05	2.42	2.31	0.00	0.00	0.00	0.00	0.00
Milch-Union Hoheifel	n.a.	27.47	30.06	31.14	40.28	n.a.	1.72	1.72	1.72	1.72
Mean	34.47	34.60	38.25	38.29	38.80	2.99	2.92	4.02	3.78	3.80
Standard Deviation	27.47	26.02	27.23	26.69	27.33	2.81	2.97	4.21	3.99	3.77
<b>Meat Cooperatives</b>										
Vion (NL)	83.53	85.82	86.88	88.52	89.45	n.a.	13.22	16.09	17.82	17.24
Danish Crown <sup>3</sup> (DK)	89.71	89.70	88.61	88.53	87.95	12.07	13.22	13.22	13.79	13.22
HK Scan (FI)	33.62	35.19	68.51	67.99	65.86	2.87	2.87	4.60	5.17	5.17
Westfleisch (DE)	24.86	26.55	31.67	34.11	31.60	0.57	1.15	1.15	1.72	2.30
Nortura (NO)	2.74	2.94	2.30	3.21	3.24	0.00	0.00	0.00	0.57	0.57
Atria (FI)	36.02	39.40	42.49	42.38	41.75	2.30	2.30	3.45	4.02	4.02
Tican <sup>3</sup> (DK)	86.33	91.46	90.51	90.18	88.95	0.57	1.15	1.15	1.15	1.15
Mean	50.98	53.01	58.71	59.28	58.40	3.07	4.84	5.67	6.32	6.24
Standard Deviation	32.39	32.97	31.56	31.18	31.32	4.15	5.36	5.91	6.27	5.97
<sup>1</sup> merged 31.12.08										
<sup>2</sup> financial year ending March										
<sup>3</sup> financial year ending September										

Source: Company data, authors' calculations

#### 4.2 Development of Financial Performance

Like the degrees of internationalization, the results concerning the financial performance indicators are also very heterogeneous and do not reveal a clear trend. Table 3 shows the results for the Return on Assets (ROA) and the Return on Sales (ROS) for the dairy and meat cooperatives in our sample. In some years the average ROA figures are clearly higher for the meat cooperatives than for the dairy cooperatives, indicating that these firms were able to achieve higher margins on their average total assets. Also regarding the ROS, the meat cooperatives achieved higher performance on average than their counterparts from the dairy sector for the years 2005 to 2007. However, for 2008 and 2009, the average ROS figures for the dairy cooperatives outperformed those for the meat cooperatives. Nevertheless, the sometimes high values for standard deviation indicate that there are high- and low-performers in the dairy as well as in the meat sector.

**Table 3.**  
Development of Return on Assets and Return on Sales

Company	Return on Assets					Return on Sales				
	2005	2006	2007	2008	2009	2005	2006	2007	2008	2009
<b>Dairy Cooperatives</b>										
FrieslandCampina <sup>1</sup> (NL)	n.a.	n.a.	7.27	4.93	5.32	n.a.	n.a.	4.14	2.62	3.16
Arla Foods (DK/SE)	5.74	4.33	5.30	3.83	4.76	3.25	2.55	3.18	2.32	3.05
Sodiaal (FR)	n.a.	n.a.	n.a.	2.00	2.22	n.a.	n.a.	n.a.	0.72	0.93
Tine (NO)	5.47	4.58	7.09	6.73	9.34	3.05	2.50	3.79	3.58	4.92
Nordmilch (DE)	1.96	-5.75	9.38	7.32	8.85	0.53	-1.56	2.20	1.57	2.38
Glanbia (IE)	8.92	8.04	9.90	10.19	7.80	4.40	4.62	5.25	6.01	6.07
Irish Dairy Board (IE)	5.86	5.79	4.47	2.92	4.84	2.08	2.08	1.68	1.16	2.07
Valio (FI)	2.80	1.64	2.61	0.56	4.22	1.46	0.82	1.29	0.27	2.21
Emmi (CH)	5.36	4.93	3.94	6.15	6.53	3.07	2.85	2.49	3.79	4.16
Humana Milchunion (DE)	n.a.	2.04	5.16	3.96	3.62	0.99	0.63	1.47	1.05	1.16
Hochwald (DE)	n.a.	1.13	1.63	1.33	1.23	0.53	0.36	0.52	0.41	0.40
Granarolo (IT)	2.04	1.59	2.20	4.40	7.89	1.49	1.21	1.67	3.17	5.73
Milk Link <sup>2</sup> (GB)	n.a.	9.34	9.96	9.06	8.91	3.11	3.80	4.03	3.62	3.57
Milch-Union Hocheifel	n.a.	1.88	3.26	2.58	2.65	n.a.	0.55	0.95	0.72	0.91
Mean	4.77	3.29	5.55	4.71	5.58	2.18	1.70	2.51	2.22	2.91
Standard Deviation	2.22	3.72	2.81	2.77	2.58	1.22	1.62	1.39	1.61	1.75
<b>Meat Cooperatives</b>										
Vion (NL)	5.36	6.68	8.20	4.37	5.32	1.89	2.09	2.94	1.53	1.91
Danish Crown <sup>3</sup> (DK)	7.58	8.28	8.71	8.20	7.46	3.57	3.83	4.22	3.87	3.66
HK Scan (FI)	5.11	7.60	6.41	3.37	4.99	2.73	4.32	2.55	1.63	2.55
Westfleisch (DE)	n.a.	5.33	10.76	7.00	6.59	0.67	0.85	1.80	1.08	1.08
Nortura (NO)	5.79	2.39	2.94	2.53	3.98	2.68	1.02	1.33	1.18	1.92
Atria (FI)	6.93	6.06	10.92	3.60	2.46	4.11	3.76	7.43	2.83	2.09
Tican <sup>3</sup> (DK)	16.11	16.98	8.84	7.90	7.75	6.26	6.81	3.25	2.92	3.22
Mean	7.81	7.61	8.11	5.28	5.51	3.13	3.24	3.36	2.15	2.35
Standard Deviation	3.81	4.21	2.55	2.18	1.77	1.64	1.95	1.88	0.98	0.81
<sup>1</sup> merged 31.12.08										
<sup>2</sup> financial year ending March										
<sup>3</sup> financial year ending September										

Source: Company data, authors' calculations

### 4.3 Internationalization-Performance Relationship

Analyzing the internationalization-performance relationship, we find a significant positive influence of the Degree of Internationalization on ROS as well as on ROA. Since the variables in the model are log transformed, our results indicate that a 1 % increase in the degree of internationalization implies a 0.578 % increase in ROS as well as a 0.429 % increase in ROA. Moreover, firm size as measured by the natural logarithm of total sales has a significant—but negative—influence on firm performance. In contrast, the size of the domestic market has no significant influence on the performance of the cooperatives in our sample. Interestingly, the dummy variable for time ( $dt\_2$ ) shows a slightly significant negative influence on ROS and a significant negative influence on ROA in the year 2006.

Table 4 shows the results of our entity and time fixed effects model with heteroscedasticity- and autocorrelation-consistent standard errors for the internationalization-performance relationship in the cooperative meat and dairy sector.

**Table 4.**  
Results of the fixed effects GRETL model

	<b>ROS</b> (n=87)	<b>P-Value</b>	<b>ROA</b> (n=83)	<b>P-Value</b>
<b>DOI</b>	0.578 **	0.011	0.429 **	0.024
<b>Firm Size</b>	-1.149 ***	0.001	-0.742 ***	0.002
<b>Country Size</b>	3.971	0.360	6.253	0.126
<b>dt_2</b>	-0.156 *	0.079	-0.283 ***	0.003
<b>dt_3</b>	0.180	0.166	0.005	0.965
<b>dt_4</b>	-0.085	0.609	-0.301 **	0.048
<b>dt_5</b>	0.040	0.772	-0.227 **	0.048
<b>R<sup>2</sup></b>	0.888		0.847	
<b>Adjusted R<sup>2</sup></b>	0.839		0.775	
<b>F</b>	18.209		11.878	
*p<0.1; **p<0.05; ***p<0.01 (two-tailed tests) All variables are log transformed.				

Source: Authors' calculations

## 5 Discussion

The results of our study indicate a positive internationalization-performance relationship for the leading European dairy and meat cooperatives we analyzed. Our findings are in line with other scholars' results indicating that higher levels of internationalization are associated with positive returns (Vernon, 1971; Bühner, 1987; Grant, 1987; Kim et al., 1993; Delios and Beamish, 1999; Zahra et al., 2000; Annavarjula et al., 2005). The findings are also in line with the S-curve hypothesis, according to which internationalization produces positive returns up to a certain level of investment in international operations. Internationalization in the food industry is still in its infancy. Many German food processors, for instance, show only very limited degrees of internationalization and have mainly entered markets characterized by geographical and cultural proximity but have so far refrained from investing in more distant markets, for instance in Asia (Theuvsen and Heyder, 2011). This is a situation in which a positive relationship between internationalization and financial performance is very likely.

Nevertheless, as shown above, the findings of previous studies are quite contradictory. While some studies found a positive relationship between internationalization and performance, others identified a negative relationship between them or even no relationship at all. These ambiguous outcomes can result from various factors. First of all, an insufficient conceptualization of the measure for the degree of internationalization could explain the contradictions. Measurement errors might have occurred in the quantitative determination of the degree of internationalization and the performance measures (Annarvajula and Beldona, 2000, Oesterle and Richta, 2009). For instance, the volatility of foreign exchange rates might have affected the FSI of the companies in our sample because an increase or decrease in foreign exchange rates can easily lead to a substantial change in the FSI. Moreover, Glaum and Oesterle (2007) noted that single-item measurements (FSI as well as NSI) do not sufficiently explain the multi-dimensionality of internationalization. Consequently, we developed a more sophisticated solution and apply a combination of two concepts to measure internationalization by constructing the Degree of Internationalization (DOI), which combines the Foreign Sales Index (FSI) and the Network Spread Index (NSI) (Ietto-Gillies, 1998) into one measure (Ebneith, 2006). Nevertheless, the question arises whether it would not be more reasonable in future research to attach greater weight to the NSI since, by depicting foreign direct investment activities, it describes a more intensive form of international involvement than simply exporting goods.

Moreover, the choice of performance indicators is allied with further challenges. Common accounting-based profitability measures are associated with heterogeneity of accounting methods and possible managerial manipulation (Li, 2007). Varying accounting policies between countries could lead to distorted results. Since we analyze companies from various European countries, it is unavoidable that the sample includes companies that are subject to different accounting policies. With respect to this problem, we

tried to find performance measures that are mostly insensitive to varying accounting policies. By using ROA and ROS to express a firm's profitability, our approach is in line with the predominance of existing studies (cf. Li, 2007).

Despite the abovementioned difficulties, we have provided an initial overview of the status quo in the internationalization process of European dairy and meat cooperatives and linked these results to their financial performance.

Our findings reveal interesting insights into the internationalization of cooperatives. It is often argued that cooperatives lack internationalization and have evident difficulties and disadvantages in pursuing internationalization strategies compared to companies with different legal structures. The structural peculiarities of cooperatives are usually explained by referring to new institutional economics and include problems such as investment horizon and the free-riding problem (Cook, 1995; Theuvsen, 2006). However, from our sample we cannot confirm that cooperatives lag behind in the internationalization process. Our findings show a broad range from widely internationalized cooperatives to ones that are still in the first stage of internationalization. This could also be due to the fact that the companies in our sample are not as greatly affected by the structural problems mentioned as normal cooperatives are. Many of the companies in our sample have changed their legal form while preserving their cooperative principles or have outsourced their operating business activities and act solely as holding cooperatives. This is a common process among cooperatives and is not restricted to the agribusiness sector (Beuthien, 1996).

By analyzing the FSIs of the cooperatives in our sample, it has become obvious that the largest companies in the sample have the highest foreign sales ratios. But the smallest companies also show remarkable results for the FSI. Several studies have analyzed the relationship between firm size and internationalization (e.g. Calof, 1993). They found a positive relationship but, at the same time, concluded that smaller firm size does not have to be an obstacle in the process of internationalization and, therefore, could not be used as an explanation for differing degrees of internationalization.

On the one hand, the varying levels of internationalization of the cooperatives in our sample may originate in differing strategies, which influence such elements as production programs. While some cooperatives in the dairy sector focus on producing high-value products and have developed international brands, others concentrate primarily on producing commodities (Schramm et al., 2004). This decision regarding production programs has an important impact on export activity and, therefore, on the observed degree of internationalization. On the other hand, scholars long have acknowledged that companies located in countries with small domestic markets tend to generate higher shares of their total sales on foreign markets (Kutschker and Schmid, 2008). For these companies, internationalization offers the only opportunity for growth that is accompanied by economies of scale and higher performance due to rationalization. Thus, companies from small countries tend to have higher degrees of internationalization and could thus distort the results. For this reason, we used control variables in our model and assessed the size of the domestic market and took the natural logarithm of the number of inhabitants in a company's home country as a proxy. Notwithstanding, the small-country effect can also be seen in our sample: The cooperatives with the highest degrees of internationalization are based in Denmark and the Netherlands.

Although the leading European dairy and meat cooperatives show a positive internationalization-performance relationship, one should keep in mind that not all companies necessarily seek to maximize their accounting profits. Especially cooperatives have broader goals, including the support of their members and creating membership value (Beuthien et al., 2008). Thus, it may be the case that internationalization also has positive effects from the perspective of the farmer-owners, such as higher prices for raw milk or slaughter cattle due to successes on international markets, that go beyond ROA and ROS and that are not reflected in our measurement model.

## 6 Conclusions

A literature review at the beginning of this paper showed that, although there are already a lot of studies concerning the internationalization-performance relationship, only a very small number of them focus on companies in the agribusiness and even fewer on cooperatives in this industry sector. Therefore, this study adds substantially to our knowledge of internationalization and the internationalization-performance relationship in agribusiness. Our results show a positive relationship. This has the interesting managerial implication that managers in meat and dairy cooperatives should try to expand their international business. However, the decision to operate in international markets should only be made after thoroughly considering all opportunities but also all risks. Although we found that

internationalization has a positive impact on performance there are, of course, many other factors that influence a firm's performance. Moreover, we cannot say which internationalization strategy leads to higher gains—directly investing in foreign countries or just exporting to foreign markets. Nonetheless, making agribusiness firms ready for international expansion through such practices as setting up adequate controlling and reporting systems and implementing required human resource management strategies could be a starting point for cooperatives seeking to the profit potentials of international markets.

Internationalization is sometimes seen as “the consequence of a process of incremental adjustments to changing conditions of the firm and its environment” (Johanson and Vahlne, 1977, 26) rather than the result of a strategy for optimal allocation of resources. The question of whether there is an optimal degree of internationalization is still very controversial. Thus, further research could specify a quadratic or cubic regression term and test for inflection points in the relationship. Additionally, larger samples from other agribusiness subsectors and from non-cooperative companies could provide more information about the relationship between internationalization and firm performance. Furthermore, performance indicators that reflect cooperative specific goals (for instance, creation of membership value) should also be taken into account. Last but not least, the internationalization strategies of companies and attitudinal attributes of managers could be analyzed and combined with quantitative findings to shed even more light on the internationalization-performance relationship in European agribusiness.

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## Appendix I: Development of EBIT

Company	EBIT in € m				
	2005	2006	2007	2008	2009
<b>Dairy Cooperatives</b>					
FrieslandCampina <sup>1</sup> (NL)	n.a.	n.a.	373.000	248.000	258.000
Arla Foods (DK)	201.965	155.649	204.010	154.104	189.627
Sodiaal (FR)	n.a.	n.a.	n.a.	19.700	23.200
Tine (NO)	54.276	46.486	73.416	75.318	104.353
Nordmilch (DE)	10.737	-30.296	51.534	39.565	44.383
Glanbia (IE)	80.569	85.567	115.834	134.054	111.166
Irish Dairy Board (IE)	41	43	36	24	38
Valio (FI)	23.038	13.304	22.082	5.050	39.419
Emmi (CH)	40.219	42.284	37.938	64.316	72.187
Humana Milchunion (DE)	17.730	11.706	31.681	22.940	19.559
Hochwald (DE)	5.443	3.887	6.208	5.077	4.252
Granarolo (IT)	13.262	10.981	15.593	30.694	51.563
Milk Link <sup>2</sup> (GB)	26.095	28.354	30.755	24.834	22.012
Milch-Union Hocheifel (DE)	n.a.	2.555	5.181	4.485	4.826
Mean	46.768	34.467	77.137	60.886	70.158
Standard Deviation	53.362	45.898	100.119	68.573	71.273
<b>Meat Cooperatives</b>					
Vion (NL)	117.792	153.157	205.485	130.352	171.824
Danish Crown <sup>3</sup> (DK)	232.803	249.320	251.228	243.549	219.978
HK Scan (FI)	24.100	40.400	53.800	37.500	54.200
Westfleisch (DE)	10.720	14.217	30.379	21.726	20.443
Nortura (NO)	34.620	16.584	23.081	21.174	33.590
Atria (FI)	40.167	41.533	94.546	38.417	27.514
Tican <sup>3</sup> (DK)	21.606	27.732	16.163	16.601	16.025
Mean	68.829	77.563	96.383	72.760	77.653
Standard Deviation	74.530	82.901	87.719	78.675	76.719
<sup>1</sup> merged 31.12.08					
<sup>2</sup> financial year ending March					
<sup>3</sup> financial year ending September					

Source: Company data, authors' calculations

## Appendix II: Development of DOI

Company	Degree of Internationalization (DOI) (%)				
	2005	2006	2007	2008	2009
<b>Dairy Cooperatives</b>					
FrieslandCampina <sup>1</sup> (NL)	n.a.	n.a.	42.54	42.39	42.55
Arla Foods (DK)	34.86	35.57	36.47	35.26	35.86
Sodiaal (FR)	n.a.	n.a.	n.a.	8.63	8.23
Tine (NO)	7.03	7.30	7.61	7.83	8.71
Nordmilch (DE)	n.a.	17.97	16.18	13.55	14.93
Glanbia (IE)	31.35	30.52	34.09	35.66	n.a.
Irish Dairy Board (IE)	51.44	51.44	51.44	51.44	51.44
Valio (FI)	19.16	19.43	19.98	17.30	17.80
Emmi (CH)	13.26	13.78	14.61	14.77	16.05
Humana Milchunion (DE)	14.93	15.20	14.64	13.12	n.a.
Hochwald (DE)	13.33	17.96	18.02	17.49	17.81
Granarolo (IT)	1.16	1.39	1.29	n.a.	n.a.
Milk Link <sup>2</sup> (GB)	2.33	3.02	2.02	1.21	1.15
Milch-Union Hocheifel (DE)	n.a.	14.60	15.89	16.43	21.00
Mean	18.89	18.76	21.14	21.16	21.41
Standard Deviation	15.09	13.66	14.86	14.47	14.77
<b>Meat Cooperatives</b>					
Vion (NL)	n.a.	49.52	51.48	53.17	53.34
Danish Crown <sup>3</sup> (DK)	50.89	51.46	50.91	51.16	50.59
HK Scan (FI)	18.25	19.03	36.55	36.58	35.52
Westfleisch (DE)	12.72	13.85	16.41	17.92	16.95
Nortura (NO)	1.37	1.47	1.15	1.89	1.91
Atria (FI)	19.16	20.85	22.97	23.20	22.88
Tican <sup>3</sup> (DK)	43.45	46.30	45.83	45.67	45.05
Mean	24.31	25.49	28.97	29.40	28.82
Standard Deviation	17.30	17.72	17.28	16.91	16.75
<sup>1</sup> merged 31.12.08					
<sup>2</sup> financial year ending March					
<sup>3</sup> financial year ending September					

Source: Company data, authors' calculations