Determinants of successful product innovations in the German food industry

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1 Introduction and motivation

The food processing industry is one of the largest manufacturing sectors in Germany with a turnover of €182.3 bn. in 2015 (Eurostat 2016). It is a market characterized by strong competition, market saturation (e.g. Menrad 2004) and increasingly sophisticated consumers. Thus, firms in this industry continuously have to adjust their product and process quality to meet consumers demand.

Innovation is considered important to generate and retain competitive advantages. However, innovation intensity in the food processing industry is low compared to other manufacturing sectors and the number of newly introduced food products constantly declines (-5.3% between 2010- 2012) (European Commission 2014). Moreover, up to 90% of newly introduced food products fail, i.e. are withdrawn from the market within two years after being first introduced (Steward-Knox and Mitchell 2003).

Research investigating the determinants of innovation success for the food sector is limited as the focus has either been on determining the drivers to perform innovation without considering the economic success or on case studies with a small number of companies and products (e.g. McNamara et al. 2013, Ciliberti et al. 2016).

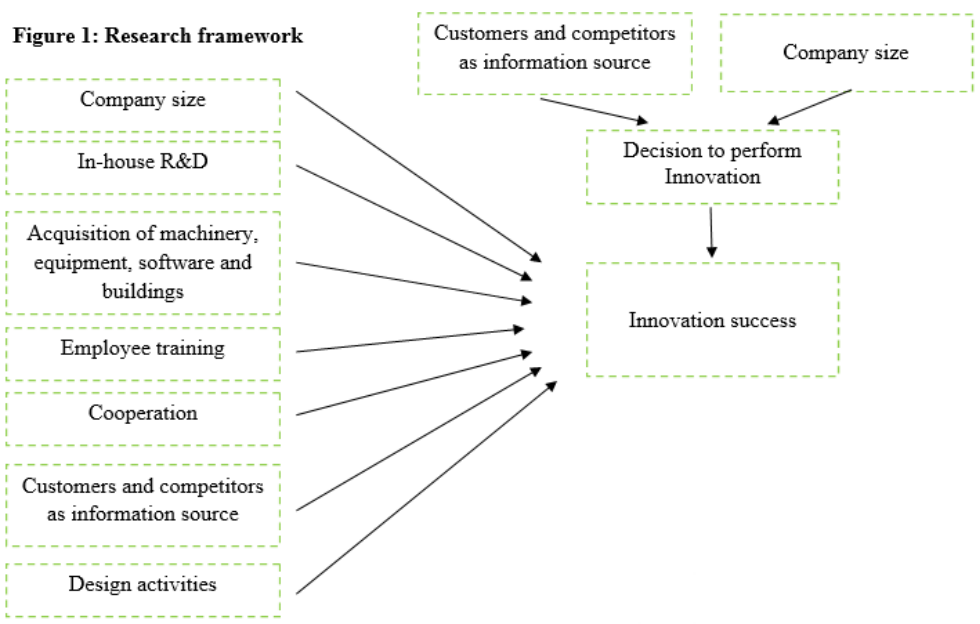
2 Objectives

- Identify firm-specific and external determinants of successful product innovations in the German food industry based on
  - a theoretical framework derived from a systematic literature review on 'success-failure research' of innovations
  - an empirical assessment using regression analyses
- Derive implications for innovation management in the food sector

3 Research framework

Determinants of innovation success are identified based on theoretical concepts from industrial organization and strategic management (e.g. Resource Based View, Knowledge Based View) as well as from previous empirical research on innovation performance:

Figure 1: Research framework



This framework is empirically tested by applying a double hurdle model that disentangles the decision to perform innovation from the innovation success

4 Data

- Community Innovation Survey 2012 provided by Eurostat which covers innovation characteristics and activities of EU firms over the time span 2010-2012
- We focus on Germany the EU leader regarding food industry turnover (15.5% contribution to total EU food industry turnover in 2014) (Eurostat 2016)
- The final sample consists of 275 German food processors and covers the time span 2010-2012
- 30.5% of firms in the sample have performed innovation during the analyzed time span by introducing new or significantly improved products
- Variables used to empirically test the research framework (Figure 1):

Theoretical measure	Empirical measure from CIS database
Innovation Success (TURNINOV)	Share of turnover generated in the last year of the survey with product innovations introduced in the previous three years
Firm size (SIZE)	Log turnover at end of reporting period
Innovation capability (RDIN)	Dummy = 1 if company has undertaken in-house R&D activities
Acquisition of purchasable resources (RMAC)	Dummy = 1 if company acquired machinery, equipment, software and buildings used for new or significantly improved products/processes
Design activities (RDSG)	Dummy = 1 if company engaged in activities to design or alter the shape or appearance of goods or services
Employee training (RTR)	Dummy = 1 if company provides employee education w.r.t. the develop of new or significantly improved products and processes
Cooperation with external partners (CO)	Dummy = 1 if a firm has cooperated with external partners to develop or improve products
Customers as information source (SCLI)	The importance of customers as source of information evaluated on a 4-point scale
Competitors as information source (SCOM)	The importance of competitors as source of information evaluated on a 4-point scale

5 Preliminary results and discussion

Determinants of innovation success: Double hurdle estimates

Variables					
Innovation Success			*Decision to perform innovation*		
	Coeff.	**SE**		**Coeff.**	**SE**
SIZE	**-0.101***	0.059	SIZE	**0.112***	0.059
RDIN	**0.668****	0.276	SCLI	**0.847*****	0.169
RMAC	**1.058*****	0.285	SCOM	**0.332****	0.131
RDSG	0.312	0.271	Constant	-3.299***	0.945
RTR	-0.061	0.245			
CO	**-0.737****	0.334			
SCLI	0.280	0.182			
SCOM	0.010	0.125			
Constant	-2.754***	0.987			
LR chi2(8)	130.01***				

- The decision to perform innovation is driven by firm size and the importance of customers and competitors as information source
- Innovation success is lower for larger firms and those which cooperate with external partners while in-house R&D activities and the acquisition of assets to develop new products significantly increase innovation success

➢ Large firms typically have greater financial resources they can assign to innovation activities. However, particularly for those firms it tends to be important to focus on the "right" innovations that lead to success, namely truly new product innovations

➢ Although cooperation can provide access to important resources for innovation success, firms that cooperate with external partners should carefully consider possible downsides to cooperation such as unfavorable dependencies or leakage of sensitive information. An alternative would be to substitute external cooperation with an increase in-house R&D activities

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