Going Tech or Non-Tech
Innovation Strategies in the Food Sector

Manuel Toselli

April 20, 2015

Univerità degli Studi di Torino- Lungo Dora Siena 100/a Torino, Italy
Email: manuel.toselli@unito.it
Phone: +39 3338560535

Extended Abstract

For policy makers and scholars, innovation is an established key factor of economic growth. Thanks to the pioneering work of Grilliches (1979) on the interaction between innovation and productivity, during the last twenty years scholars (Marin, 2014; Peters et all, 2013; Hall et al., 2009; Griffith et al.,2006; Loof et al., 2004;Crepon et al., 1998) had paid attention to firm level, cross-sectoral, cross-country and regions differences in the innovation productivity relationship.

In the wake of such of this debate policy makers had implemented different policies for different sectors in order to foster competitiveness and productivity. This is the case of H2020 that in the context of societal challenges seek to ensure food security, sustainable smart growth and consumers' needs through and intensive reform of innovation process. The former will address competitiveness of the European agri-food industry and the sustainability of food production, processing, consumption and competition.

Among H2020 pillars (Excellent science, Industrial leadership and Societal Challenges) food sector firms may find useful founding tools in order to foster innovation related to main sensible themes. Potentially 29 billions of Euros (38% if total budget) can be at disposal of food related firms. Of which 4 billions related just to food security, sustainable agriculture (European Commission, 2013)[1]

[1] The indicative breakdown for Horizon 2020 is as follows in constant 2011 prices (in EUR

According to Alfranca et. al. (2003) competition in the food and beverage industry is currently conducted more in terms of quality, variety, diversification and safety of processed food than in terms of price. These desirable characteristics are largely the result of efforts in technical innovation as well as organisational structure and marketing strategies at the company level. However the contribution of different innovation remain unclear and underestimated (Menrad, 2007). Indeed quite often the distinction of technological innovation (TPP) and non-technological innovation (non-TPP) goes hand in hand and is not often distinguishable (Weindlmaier 2001). Innovation, in a broader sense, involves a set of simultaneous changes not only at technological level. Despite the classical distinction between product and process innovation in the literature and in order to asses the effective impact of innovative strategies and define proper policy instruments a wider and deeper analysis that take into account changes in the organisational structure as well as marketing strategies need to be applied (Ballot et all, 2014; Freeman and Soete, 1997).

The traditional supplier-dominated nature (Pavitt, 1984) is nowadays changing in few critical ways The industry is basically becoming more market-oriented as well as it relies on a set of different organisational structures. The reliance on machinery suppliers as main source of innovative activity is replaced by the need of more sophisticated technologies such as advanced instruments, electronics, biotechnology and pharmaceutical. Simple ready-to-made and ready-to-eat foods , available in all supermarkets, requires sophisticated analysis in order to increase the shelf life of the products as well as proper marketing strategy in order to find new potential market niches. Controlled oxigenations, packaging materials or new controversial techniques (i.e. GM foods) do not only require high trained employees but also a management and organisational structure that facilitated work flow and informations (Menrad, 2006; Galizzi & Venturini, 1996).

Food-processing firms confront a very heterogenous industrial environment. Food producers deal with bio-tech firms in order to improve conservation and storage: this is the case of fish and dairy firms which has to both conserve and keep fresh food. Producer of snack and refreshment have to deal with new plant and transport and thus dealing with mechanical. Albeit most of firms buy-out new technology and knowledge they need do deal first of all with market

million), i.e. using 2011 as the reference year. It is to be noted that the figures in the Horizon 2020 proposals are presented in current prices (using a fixed deflator of 2% a year), which account for inflation and are therefore higher.

requirements. The recent increase in the attention for food safety and in general on structural demand side make vital the introduction of real time testing as well as developments in the understanding of common needs.

In these therms the aims of the paper are the following two. First, highlight the contribution of both technological (TPP) and non-technological (non-TPP) innovation in order to assess their impact on productivity and second investigates whether there is a complementarity or substitution effect among different innovation modes. I make use of PITEC (Panel de innovation Technologica) database from 2006 up to 2009 which account for both economics and innovation information. The empirical strategy is based on a modified CDM model (Crepon et al, 1998). The main difference rely on the estimation of the knowledge production function through a multinomial logit that will consider a set of different innovation strategies accounting for product, process and non-TPP. For each stage of the CDM I present results based pooled data estimation. Finally I will test complementarity in performance throughout a supermodularity approach (Mohnen & Roller, 2005; Topkins, 1998; Milgorm & Roberts, 1990).

According to the supermodularity test product and process innovation are strict complements, process and non-TPP are substitute while the tests reject both complementarity substitutability between process and non-TPP

A relevant, more general result worth to be further explored in the future, is the exploitation of full panel structure through proper estimation techniques.