

Product innovation and
technological collaboration:
A combined effect on SME growth.

Mar Solé

SME growth

Growth will be dependent on the strategies that firms make use to exploit environmental conditions (Romanelli, 1989).

So, in addition to structural characteristics to the firm and the industry, **SME growth will be a function of strategic decisions** about how the firm should grow (Gilbert et al, 2006).

Growth

Modes of growth

Internal

Acquisitive

Hybrid

Modes of **SME** growth

Internal

Acquisitive

Hybrid

Growth

Growing organically involves the use of innovative product development to capture prospective audiences

(Gilbert et al., 2006, p.939)

Modes of **SME** growth

Int

innovation

Acquisitive

Hybrid

Growth

An hybrid mode would require the establishment of collaborations to overcome firm's limited capacities

(McKelvie and Wiklund, 2010).

Modes of **SME** growth

Int

innovation

Acquisitive

Hyb

collaboration

This paper examines the effect of **product innovation** and **technological collaboration** on SMEs growth



Both product innovation and technological collaboration favour growth, but... rather than assuming linear, additive effects, research increasingly focuses on fit and combined effects (Davidsson et al., 2006).

So, yes...

This paper examines the effect of **product innovation** and **technological collaboration** on SMEs growth

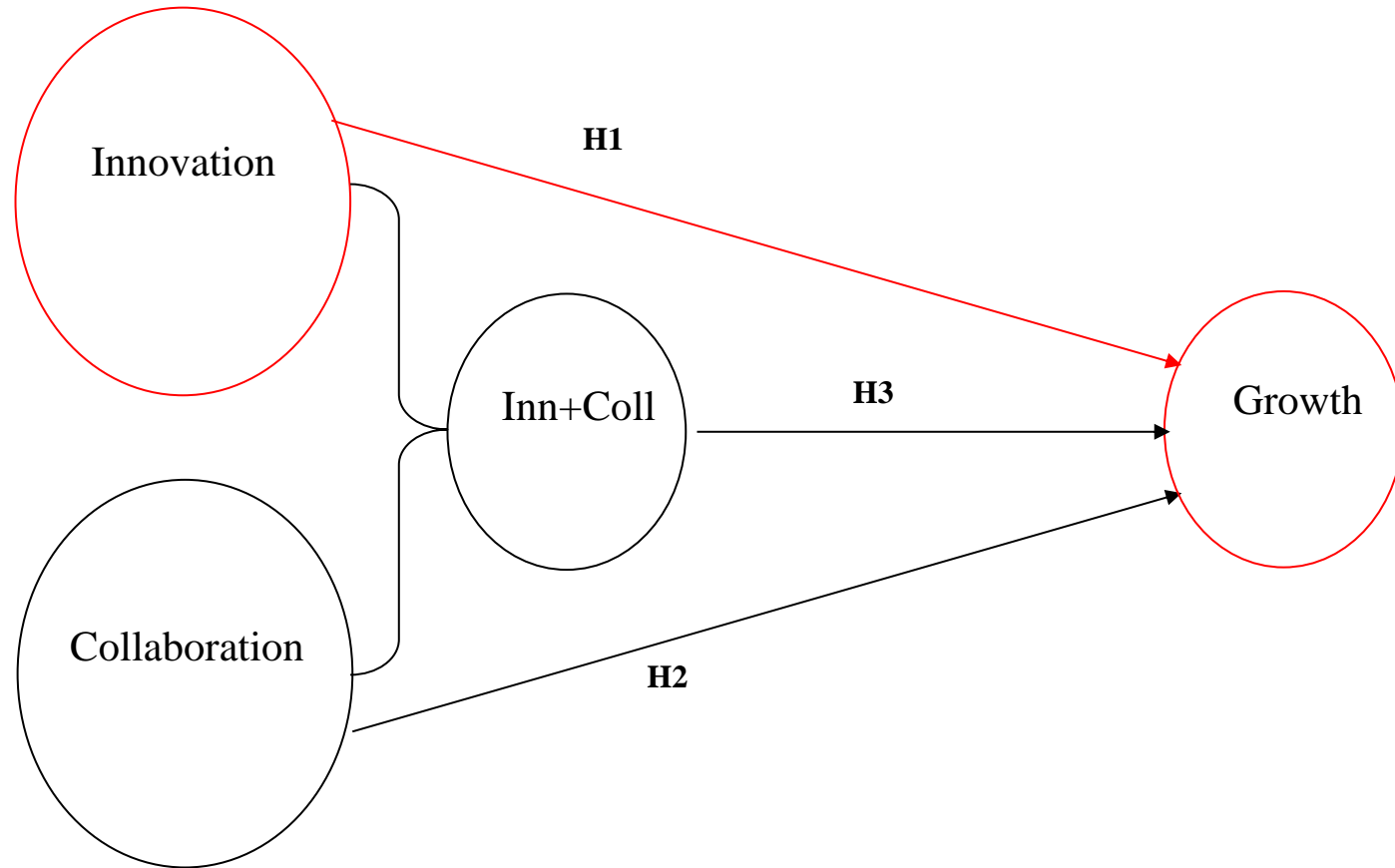
So yes...

This paper examines the effect of **product innovation** and **technological collaboration** on SMEs growth

But...

Focuses particularly on their **conjoint effect**

Product Innovation

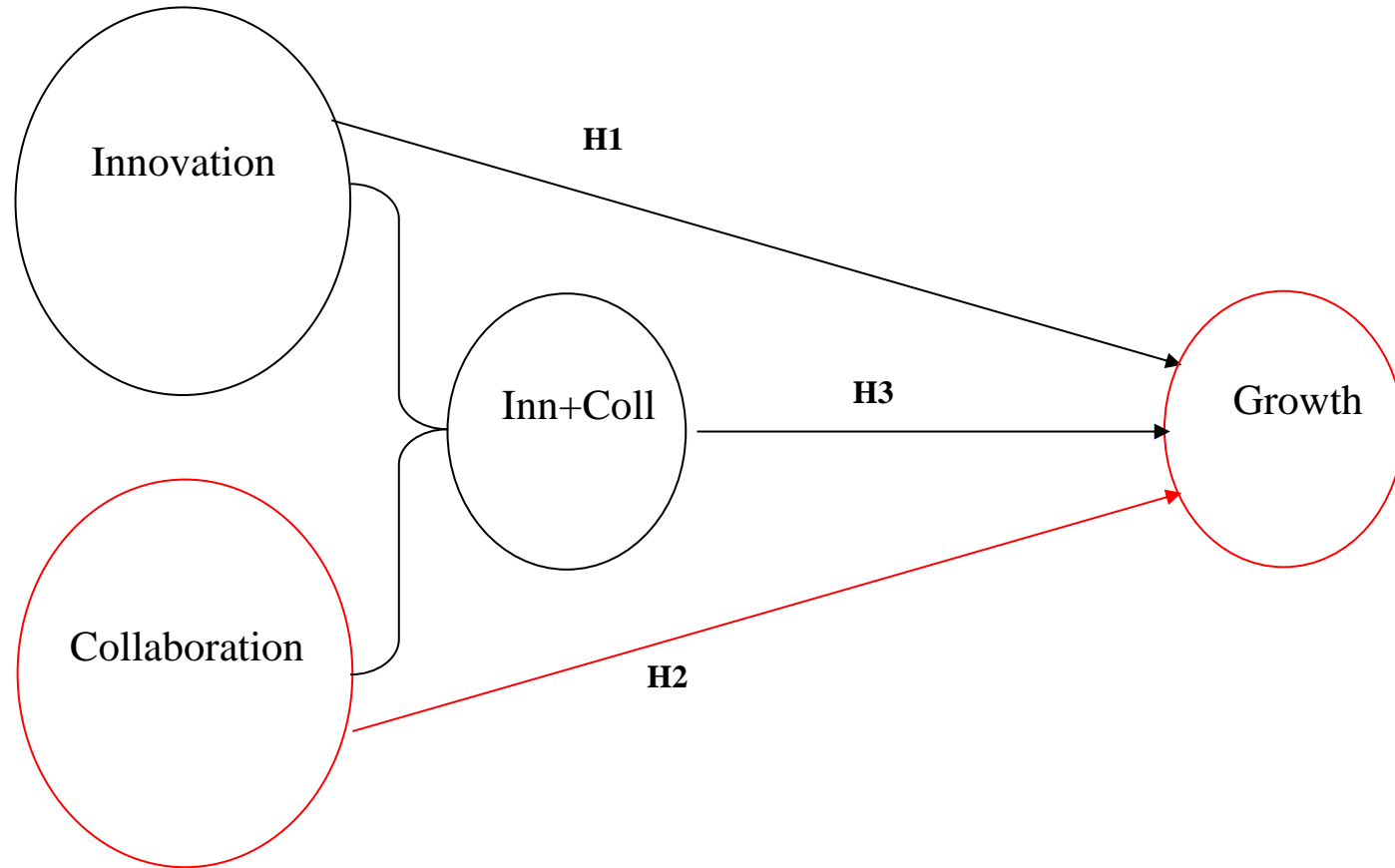


Hypothesis 1: SMEs that innovate on product will achieve greater growth rates than those that do not.

SMEs growth is often innovation-based
(flexibility, communicative setting...)

- SMEs' liabilities (can't acquire).
 - Key for competitiveness.
 - Product development.
 - Product improvement.
- Rapidly changing technologies
- Incremental rather than radical innovations.

Technological Collaboration



Hypothesis 2: SMEs that collaborate technologically will achieve greater growth rates than those that do not.

- Limitations it helps to overcome.
 - Grow without income.
 - Brings local market knowledge.
- Aim at achieving competitive advantage rather than survival or profit
 - Provide synergies.
 - Foster rapid learning.
- Bridge between firm's present resources and its expected future requirements.

Interaction

Strategies are not mutually exclusive (Noke and Hughes, 2010).

E.g. from previous literature:

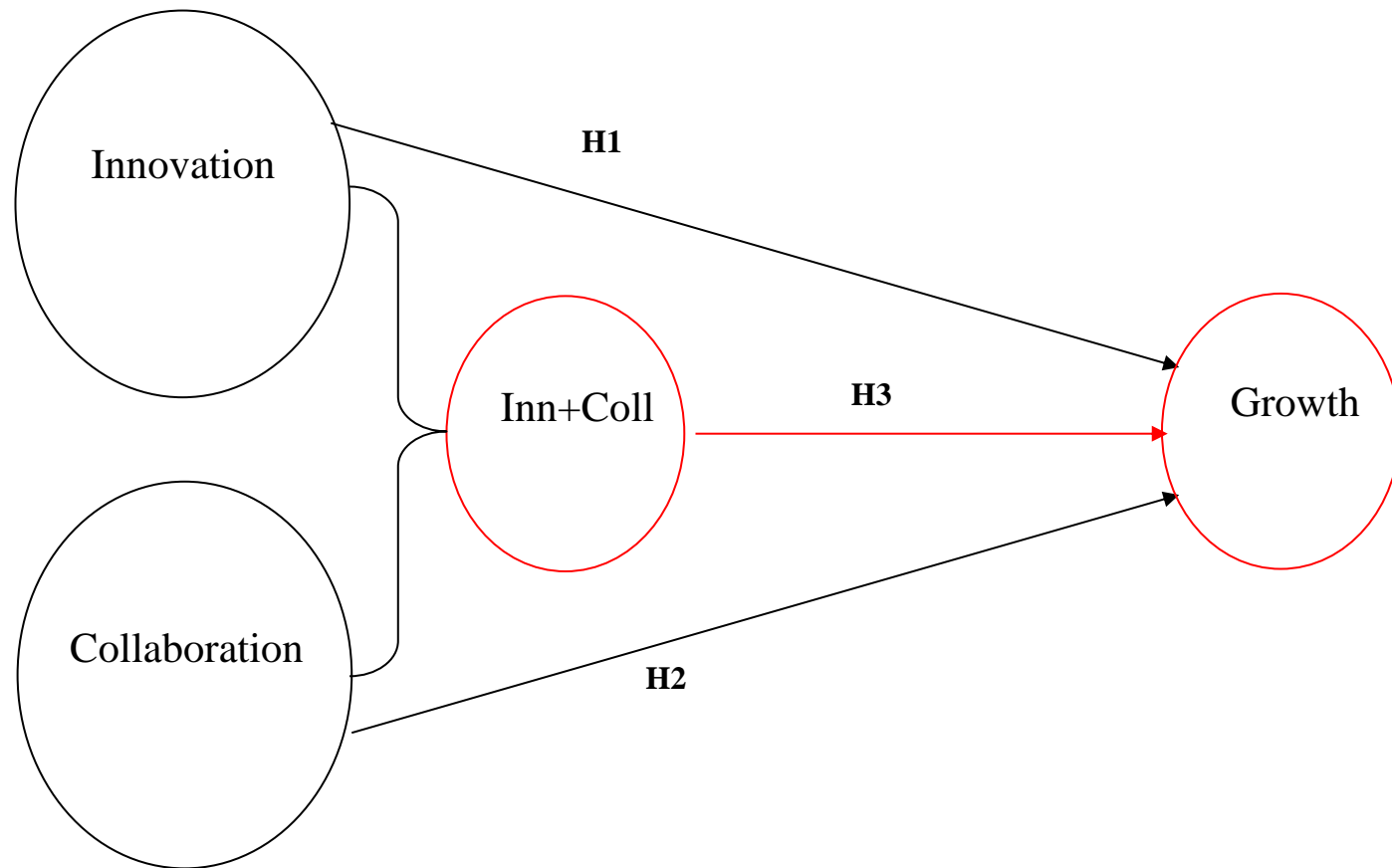
Innovation as a process resulting from various interactions among different actors (Doloreux, 2004).

Collaboration as a way to expand a firm's market abilities (Raffa et al., 1996) and sustain innovation.

Theories explaining innovation co-operation are dispersed, e.g.:

- Transaction costs (cost reduction)
- Organizational capabilities and technology-based view (enhancing firm value)
- Game theory (strategic decisions in competitive relationships)
- Relational-view (competitive advantaged through inter-firm relationships)

Reduce uncertainty.
Complement resources.
Expand intellectual capital.



Hypothesis 3: SMEs that innovate and collaborate at the same time, will achieve greater growth rates than those doing it separately, or than those that do none.

Methodology

Encuestas Sobre Estrategias Empresariales (ESEE).

10.255 observations of 4.357 Spanish manufacturing SMEs across 8 years (panel data from 1998 to 2006).

Stata.SE

Dependent variables		
Growth	Sales	$\ln \text{Sales}_{i,t} - \ln \text{Sales}_{i,t-1}$
	Employment	$\ln \text{Employment}_{i,t} - \ln \text{Employment}_{i,t-1}$

Independent variables	
Strategy	<p>4 dummy variables:</p> <ul style="list-style-type: none"> -No innovation, nor collaboration (base) -Product innovation only -Technological collaboration only -Both product innovation and technological collaboration

Control variables

Firm size	Sales	In Sales
	Employment	In Employment
Firm age	Number of years since the firm foundation	
Industry	<p>4 dummy variables:</p> <ul style="list-style-type: none"> -Supplier dominated (base) -Science based -Scale production -Specialised production 	
Success	<p>Dummy variable:</p> <p>0= up to 200 employee firm during timeframe (base)</p> <p>1= SMEs that turn large over the years, or vice versa</p>	
Year	<p>Set of 9 dummy variables:</p> <ul style="list-style-type: none"> -Observation of year 1998 (base) -(8 dummies, one per year > 1998) Observation of year X 	

Baseline model:

$$\begin{aligned} \text{In Employment } i,t - \text{In Employment } i,t-1 = & \\ & \alpha + \delta_1 \text{ Inn} + \delta_2 \text{ Coll} + \delta_3 \text{ Inn\&Coll} \\ & + \beta_1 \text{ Firm size } i,t + \beta_2 \text{ Firm Age } i,t \\ & + \delta_4 \text{ Success} + \delta_5 \text{ Industry 2} \\ & + \delta_6 \text{ Industry 3} + \delta_7 \text{ Industry 4} \\ & + \delta_8 - \delta_{16} \text{ Year} + \varepsilon_{i,t} \end{aligned}$$

	Dependent Variable			
	<i>Sales Growth</i>		<i>Employment Growth</i>	
	(7)	(8)	(9)	(10)
<i>Intercept</i>	0.03927*** (0.0096)	0.0874*** (0.0097)	0.0934*** (0.0137)	0.0996*** (0.0138)
Independent Variables				
<i>Innovation</i>		0.0210** (0.0098)		0.0210** (.0067)
<i>Collaboration</i>		0.0383*** (0.0142)		0.0349*** (0.0067)
<i>Innovation&Collaboration</i>		0.0420*** (0.0131)		0.0389*** (0.0071)
Control Variables				
<i>Firm size (employment)</i>			-0.0245*** (0.0034)	-0.0284*** (0.0035)
<i>Firm size (sales)</i>	-0.0162*** (0.0430)	-0.0195*** (0.0052)		
<i>Firm age</i>	-0.0005** (0.002)	-0.0005*** (.0002)	-0.0003*** (0.0001)	-0.0004*** (0.0001)
<i>Success</i>	0.0532** (0.0240)	0.0500** (0.0235)	0.0593*** (0.0115)	0.0566*** (0.0114)
<i>Industry 2</i>	0.0430*** (0.0093)	0.0355*** (0.0094)	0.0377*** (0.0072)	0.0293*** (0.0073)
<i>Industry 3</i>	0.0446*** (0.0074)	0.0443*** (0.0073)	0.0253*** (0.0052)	0.0246*** (0.0039)
<i>Industry 4</i>	0.0138 (0.0098)	0.0076 (0.0098)	0.0015 (0.0073)	-0.0045 (0.0073)
<i>Years included</i>				
N	10255	10255	10255	10255
R2	0.0213	0.0238	0.0195	0.0232
Wald Chi2 (14)	189.28***		178.22***	
Wald Chi2 (17)		202.58***		231.99***

Fixed Effects correcting for heteroskedasticity, and contemporaneous and serial correlation.

Results

Either product innovation (**h1**) and technological collaboration (**h2**) have a significant and positive effect on SME growth c.p., as expected from the literature.

These firms that combine both strategies (**h3**) may expect an even more positive increase in SME growth than those applying solely one of them, and much greater than those implementing none, c.p.

Conclusions

The combined effect is significantly positive, both in terms of sales and employment growth.

One positive predictor of growth may actually be a negative predictor of another one (Murphy, Trailer and Hill, 1996)

Thank you,
Any questions?

Mar Solé