

ANTECEDENTS OF SERVICITIZATION

***How Do Industry Evolution and Industry Conditions
Prompt Product Firms to Offer Services?***

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'SERVITIZATION' OF MANUFACTURING FIRMS: WHAT WE KNOW SO FAR

WHAT

- Servitization represents a growing trend of manufacturing firms to offer different services (*Bowen, Siehl, and Schneider, 1989; Suarez, Cusumano, and Kahl, 2013; Visnjic Kastalli and Van Looy, 2013*)

WHO

- Xerox, Canon, ABB, Bombardier, GE, Rolls- Royce, IBM...
... *>33% of manufacturers worldwide (>50% in US) were selling services in 2007 (Fang, Palmatier, and Steenkamp, 2008; Neely 2008)*

WHEN

- Servitization is a response to different industry conditions, such as industry lifecycle stages, competition, R&D intensity, turbulence (*Oliva and Kallenberg, 2003; Neu and Brown, 2005; Teece, 1986; Wise and Baumgartner, 1999*).
- Literature gap: when product firms offer which types of services?
 - Cusumano et al. 2014: demand-based typology (complements vs. substitutes)
 - Open question: supply-based typology (product-oriented vs. customer-oriented) (*Baveja, Gilbert, and Ledingham, 2002*).

When firms offer product-oriented and when customer-oriented services?

EXISTING LITERATURE ON SERVITIZATION

TYPES

KNOWLEDGE & RESOURCE PERSPECTIVE (Fang et al. 2008)

- Product-oriented servitization
 - Products and services come from the same knowledge base (installation, maintenance, repair, product optimization, monitoring)
- Customer-orienter servitization
 - Different knowledge bases: e.g. car manufacturer GM offering financial services, IBM's move into consulting

WHEN (ANTECEDENTS)

- **Industry lifecycle stages:**
 - **Earlier stages of the lifecycle:** i.e. when customer need uncertainty is high
 - **Later stages of the lifecycle:** i.e. when products commoditize (Wise & Baumgartner, 1999)
- **Industry R&D Intensity:** customer need uncertainty is high (Teece, 1986; Visnjic, Wiengarten, & Neely, 2014).
- **Industry Competition:** response to harsh competition in the manufacturing industry (Cohen, Agrawal, & Agrawal, 2006)
- **Industry Turbulence:** service sales non-cyclical or counter cyclical product sales in turbulent industries (Sawhney, Balasubramanian, & Krishnan, 2004).

HYPOTHESES

INDUSTRY LIFECYCLE

H1a: The likelihood that a firm offers **product-oriented services** will be higher in the **earlier stages** of the industry lifecycle.

Hypothesis 1b: The likelihood that a firm offers services that are **customer-oriented** increases in **later stages of the industry lifecycle**.

INDUSTRY R&D INTENSITY

Hypothesis 2: The likelihood that a firm offers **product-oriented** services increases with the R&D intensity of its core product industry.

INDUSTRY COMPETITION

Hypothesis 3a: Tougher competition in a firm's product industry increases the likelihood that it will offer **product-oriented services**.

INDUSTRY TURBULENCE

H4. Cyclicity of a firm's core product industry increases the likelihood that a firm offers **customer-oriented** services.

RESEARCH METHODOLOGY

DATA

- 410 public product firms from 1990 to 2011
- Source: Compustat Global and Compustat North America

DEPENDENT VARIABLES

- ***Service*** $_{f,t}$ - 1/0 when firm f reports/doesn't report service sales
- ***Product-Related Service*** $_{f,t}$ - 1/0 when firm f reports/doesn't report product-related service sales
- ***Unrelated Service*** $_{f,t}$ - 1/0 in case firm f reports/doesn't report unrelated service sales

INDEPENDENT VARIABLES

- ***Industry Maturity*** $_{i,t}$ = number of firms in the industry (Suarez et al. 2013)
 - -1 / firm number X 100 - for years before the shake out
 - 1 / firm number X 100 - for years after the shake out
- ***Industry Competition*** $_{i,t}$ = 1 - Herfindahl index based on market shares
- ***Industry Growth*** $_{i,t}$ = sales growth of the sum of firms from t-1 to t
- ***Industry Turbulence*** $_{i,t}$ = standard deviation in sales of firms over the previous 4 years / mean of sales over the four years (Fang et al., 2008)
- ***Industry R&D*** $_{i,t}$ = median % of R&D expenditure X 100

CONTROL VARIABLES

- ***Firm Market Share*** $_{f,i,t-1}$; ***Firm EBITDA margin*** $_{f,i,t-1}$; ***Firm Sales*** $_{f,i,t-1}$;
- ***Firm % of R&D expenditures*** $_{f,i,t-1}$; ***Firm slack*** $_{f,i,t-1}$

METHOD

- ***Logit model with firm fixed effects and year dummies***

DESCRIPTIVE STATISTICS

		Mean	Stdev	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	<i>Dependent variables</i>														
(1)	service	0.42	0.49	1.00											
(2)	product-oriented service (PO)	0.12	0.33	0.44	1.00										
(3)	customer-oriented service (CO)	0.32	0.47	0.80	-0.13	1.00									
	<i>Independent variables</i>														
(4)	industry maturity	-0.30	2.86	0.07	0.06	0.04	1.00								
(5)	industry competition	0.65	0.25	0.00	0.00	0.00	0.01	1.00							
(6)	industry cyclicality	0.32	0.37	0.03	-0.01	0.04	-0.03	-0.22	1.00						
(7)	industry R&D	6.74	6.44	0.04	0.08	-0.01	0.08	0.01	-0.04	1.00					
	<i>Control variables</i>														
(8)	market share t-1	0.92	4.45	0.08	0.05	0.09	0.02	0.02	-0.02	-0.09	1.00				
(9)	firm ebitda margin t-1	0.03	0.41	-0.01	0.01	-0.02	-0.02	-0.02	0.01	-0.10	0.05	1.00			
(10)	firm sales t-1	5.95	2.70	0.11	0.05	0.11	0.02	-0.10	0.11	-0.29	0.23	0.43	1.00		
(11)	firm R&D t-1	7.73	11.39	0.02	0.04	-0.01	0.05	0.08	-0.06	0.44	-0.08	-0.45	-0.32	1.00	
(12)	firm slack t-1	0.17	0.18	0.03	0.09	-0.03	0.06	0.13	-0.10	0.39	-0.06	-0.15	-0.25	0.46	1.00

Note: number of firms=410; n=5,320

FINDINGS: ENVIRONMENTAL ANTECEDENTS

	(1) PO	(2) PO	(3) PO	(4) PO	(5) PO	(6) PO	(7) CO	(8) CO	(9) CO	(10) CO	(11) CO	(12) CO	(13) services
<i>industry_maturity</i>		-0.06** (0.03)				-0.05* (0.03)		0.05** (0.02)				0.05** (0.02)	0.00 (0.02)
<i>industry_competition</i>			1.18*** (0.31)			1.18*** (0.32)			-0.00 (0.21)			0.04 (0.21)	0.35* (0.19)
<i>industry_cyclicality</i>				-0.18 (0.18)		-0.08 (0.18)				0.20* (0.12)		0.21* (0.12)	0.18 (0.11)
<i>industry_R&D</i>					0.15*** (0.04)	0.15*** (0.04)					0.02 (0.02)	0.02 (0.02)	0.05** (0.02)
<i>Firm controls</i>													
<i>market share t-1</i>	-0.01 (0.03)	-0.01 (0.03)	-0.02 (0.03)	-0.01 (0.03)	-0.02 (0.03)	-0.04 (0.03)	0.03 (0.02)	0.03* (0.02)	0.03 (0.02)	0.03 (0.02)	0.03 (0.02)	0.03 (0.02)	0.02 (0.02)
<i>firm_ebitda_margin t-1</i>	-0.19 (0.21)	-0.20 (0.21)	-0.18 (0.21)	-0.18 (0.21)	-0.19 (0.21)	-0.20 (0.22)	-0.00 (0.13)	-0.01 (0.13)	-0.00 (0.13)	-0.00 (0.13)	0.00 (0.13)	-0.01 (0.13)	0.03 (0.14)
<i>firm_sales t-1</i>	0.65*** (0.11)	0.65*** (0.11)	0.68*** (0.11)	0.65*** (0.11)	0.67*** (0.11)	0.70*** (0.11)	0.73*** (0.08)	0.73*** (0.08)	0.73*** (0.08)	0.73*** (0.08)	0.72*** (0.08)	0.72*** (0.08)	0.84*** (0.07)
<i>firm_R&D t-1</i>	0.02** (0.01)	0.02** (0.01)	0.03*** (0.01)	0.02** (0.01)	0.02** (0.01)	0.02*** (0.01)	0.00 (0.01)	0.01 (0.01)	0.00 (0.01)	0.00 (0.01)	0.00 (0.01)	0.00 (0.01)	0.01** (0.01)
<i>firm_slack t-1</i>	0.27 (0.46)	0.22 (0.47)	0.22 (0.47)	0.26 (0.46)	0.32 (0.47)	0.22 (0.47)	0.02 (0.34)	0.03 (0.34)	0.02 (0.34)	0.01 (0.34)	0.01 (0.34)	0.02 (0.34)	0.28 (0.32)
<i>year fixed effects</i>	Incl.	Incl.	Incl.	Incl.	Incl.	Incl.	Incl.	Incl.	Incl.	Incl.	Incl.	Incl.	Incl.
<i>firm fixed effects</i>	Incl.	Incl.	Incl.	Incl.	Incl.	Incl.	Incl.	Incl.	Incl.	Incl.	Incl.	Incl.	Incl.
<i>log likelihood</i>	-900.526	-898.430	-893.295	-900.016	-891.978	-882.795	-1807.867	-1805.641	-1807.867	-1806.478	-1807.393	-1803.593	-2109.926
<i>observations</i>	2,316	2,316	2,316	2,316	2,316	2,316	4,480	4,480	4,480	4,480	4,480	4,480	5,320
<i>firms</i>	174	174	174	174	174	174	343	343	343	343	343	343	410

Note: Robust standard errors in parentheses, * p<0.1, ** p<0.05, *** p<0.01

CONCLUSION & IMPLICATIONS



Product-oriented servitization:

- In emerging, R&D intensive and competitive industry conditions
- Drawing on and further fostering product knowledge

Customer-oriented servitization:

- Maturing, cyclical industry conditions
- Developing knowledge further away from the product base

DISTINCT ENVIRONMENTAL ANTECEDENTS

TWO DIFFERENT STRATEGIES

THANK YOU!