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THE LINKAGE BETWEEN PRODUCT-SERVICE PORTFOLIO AND CUSTOMER VALUE: A COUNTRY LEVEL ANALYSIS

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Abstract:
The work provides a novel empirical framework to evaluate PSS consumer demand at country level in the music industry. Research exploits a combination of real market sales and extensive consumer survey data with more than 18,000 observations in ten countries. The results demonstrate that at the time of data collection in all the countries analyzed the relative consumer demand for intangible digital music 'service' offerings is greater than that which was offered to the market by industry. The US is identified as having a PSS which most closely matches consumer demand. The results identify and give scale to the different market opportunities which exist, in this case the opportunity to expand the digital service offering. Significant correlations exist between the scale of market opportunity, a countries legal system and technological infrastructure. This opens a debate with implications for managers in addressing market needs and policy makers in regulating digital markets.

Keywords: business model, digitalization, music industry, product-service portfolio

1. INTRODUCTION

Social science lacks the appropriate concepts and methodological tools for measuring directly what we only see indirectly today (Greenstein, 2011). The hidden benefits of open innovation were first described when studying the commercialization of Xerox PARC inventions by spinoff companies (Chesbrough & Rosenbloom, 2002). They conclude that new business models can appear for manufacturers which unlock latent value from their technology, forming a connection between technical potential and realization of economic value. The potential exists in the revenue gap between current revenue and the economic value that could be realised. The success of new business models reflects the extent to which firms understand what their customer wants, how the value proposition is delivered, how the customer is locked in and the way to capture value and make a profit (Teece, 2010).

The Resource-based View suggests that resource bundles may be combined to create value propositions and capture value (Mills, Platts, & Bourne, 2003; Vargo & Lusch, 2004, 2008). A firm may provide a number of different product-service offerings using their portfolio of resources, creating Product-Service Systems (PSS) (Neely, 2008). Analysis of PSS and digital business models usually takes a qualitative perspective, and hence literature on PSS is open to further theoretical development through quantitative approaches providing robust assessment of the phenomena (Tukker, 2013). Studies are limited due to a scarcity of reliable consumer databases; which allow analysis of service-orientated business models (Sampson, 2012). This paper contributes to theory by filling a gap in literature through the development of a methodology that establishes the link between customer demand and the product and digital service portfolio offered across 10 developed countries in the context of the music industry. The work exploits a combination of real market sales data from IFPI and data from 18,000 customer surveys provided by a major music-licensing firm (Bustinza et al., 2013a). This analysis allows the estimation of the business model challenge for each country. That is, the gap between what the industry offers and what the consumer desires is inversely linked to digital dark matter within PSS.

In sum, the main goal of this paper is to respond empirically to the following research question: Are current digital business models fully satisfying consumer needs?

The order of the article is as follows. Next section builds upon theoretical framework of business models, servitization and competitiveness to position research questions and the empirical hypothesis. The following sections present the context of the study, the data and the results. Conclusions close the work.

2. THEORETICAL UNDERPINNING AND MODEL DEVELOPMENT

2.1. Business models, PSS, and consumer needs

Baines et al. (2007) defined PSS as a unified mix of products and services that deliver value in use. This is consistent with the paradigm shift for manufacturing firms to compete through value-in-use and differentiation instead of cost (Porter et al., 2003). Based on the generic strategies for competitive advantage established by Porter (1979) the concepts of PSS and servitization are linked to firm differentiation obtained by knowing the requirements of a customer base and creating barriers to entry through adding services which enable products to be differentiated.

Neely (2008) stated that one of the main challenges associated with PSS is the “business model and customer offering”. This challenge is related to the lack of knowledge of how to design and deliver complex services and the organisational capabilities required to do so (Neely, 2010). Further, a PSS co-ordinating firm may erroneously assume homogeneous customer capability in accessing the value of the PSS portfolio on offer, particularly when they provide a spectrum of possible product and service regimes (Ng et al., 2011; Bustinza et al., 2013b).

In the complementary PSS scenario customers select combinations of service offerings to support their use of the product. In the cannibalistic PSS scenario this does not happen, which suggests the provider must develop different business models to generate market revenue and meet customer needs (Teece, 2010). A strategy of customer needs linked to business model is required to provide PSS which realise value-in-use for customers (Vargo & Lusch, 2004, 2008). Business models

emerging from the process of servitization in manufacturing sectors with complementary PSS develop the firm's innovative capabilities in creating value at the customer level by creating the correct balance of products and services (Visnjic & Van Looy 2013). But is this also happening in cannibalistic PSS? This question is directly linked to the research question to this article.

Hypothesis 1: Do bundles of Product-Service in cannibalistic PSS satisfy consumer needs?

3. THE PSS OF THE MUSIC INDUSTRY

3.1. Industrial context

The music industry is led by 3 major music-licensing firms who hold over 60% of the market share in terms of property rights to music resource (Informa Telecoms & Media 2010). The companies and their artists may influence the final combination of products and services, tangible and intangible formats, which are offered in each market through distribution and promotion channels (Bockstedt et al., 2005). The music industry represents a sector where revenues were in sharp decline between 1999 and 2012 (Bustinza et al., 2013a; Myrthianos et al., 2014). Music industry was the first creative industry to suffer the threat of piracy which is being largely discussed as one of the main factors for explaining this decrease in revenues (see Parry et al., 2014 for a comprehensive summary of the literature). The industry adapted to piracy with the implementation of digital business models, in particular through downloads via platforms such as iTunes (Parry et al., 2012). The experience of the music industry is instructive to other industries digitalizing their resources and transiting from a product-centric business model to PSS. This includes other creative industries like cinema, videogames and books.

3.2. The data

Unique music industry dataset comprising information for 10 countries in 2010 was collected. The countries selected cover different geographical locations and legal systems (Djankov et al., 2002). In particular information from three independent sources is used for ten innovation-driven economies: US, Canada, Australia, Japan, UK, Germany, France, Italy, Netherlands and Spain. The survey contains 18,842 observations and a more detailed description can be seen in Bustinza et al. (2013a).

4. RESULTS

The first stage in the empirical design is to analyse consumer preference through logistic regressions. Table reports the results of two logistic regressions. Column 1 analyses the propensity to purchase in tangible format against not purchasing and the explanatory variables explain approximately 21% of the variance of the dependent variable. Column 2 analyses the propensity to purchase in intangible format, a model with an explanatory capacity of approximately 16%.

Consistent with most of previous literature using survey data (Parry et al., 2014) file sharers are found to exhibit a lower probability of purchasing music in tangible or intangible format, providing evidence of the purchase substitution phenomenon (Liebowitz & Watt, 2006). Ceteris paribus, file sharers have 19.8% (20.9%) lower probability of purchasing intangible (tangible) formats than non-file sharers. These results are statistically significant at 1%. The parameters in both columns are similar with one exception related to the variable 'gender'. While there is no significant difference in the propensity to purchase in tangible format between males and females, males are, ceteris paribus, 1.7% more likely to purchase music in intangible format than females. This result is significant at 1%.

The estimated demand functions show that the average likelihood to purchase digital music is highly heterogeneous across countries. There is larger preference for digital music in Anglo-Saxon countries including UK, US or Australia. Latin countries like France, Italy and Spain have the lowest preference for digital music. Similar heterogeneity is found for physical format suggesting that Anglo-Saxon countries are more willing to purchase music.

5. DISCUSSION AND CONCLUSIONS

The transition towards service business models is not cost free (Suarez et al., 2013) but can potentially enhance firm profitability and innovation (Visnjic & Van Looy 2013). In that regard this paper provides a new empirical methodology to understand the gap between business models value propositions in PSS. The context of the research (the music industry) is sector specific but the results and methods can be considered for use in other creative industries such as publishing or motion pictures (Parry et al., 2014) facing similar transitions towards a cannibalistic combination of physical and digital formats (Koukova et al., 2012). Results are also relevant for the private sector. The methodology provides evidence of consumer demand exceeding supply of intangible digital format music, which suggests the music industry needs to examine its PSS market offering and increase the support given to firms providing digital content. The success of a product-service combination is determined by good understanding of market demand. Appropriate resource bundles can then be co-produced and dialog with customers undertaken to educate partners as to the value of the proposed offer (Vargo & Lusch, 2008).

Table 1: The propensity to purchase in tangible and intangible form through logistic regression

	Independent Variables	Tangible Buyer vs. Non Buyer	Intangible Buyer vs. Non Buyer
Variables related to Value-In-Use	Passion for Technology	0.751*** (0.046)	0.520*** (0.039)
	File Sharers	-0.849*** (0.049)	-0.928*** (0.041)
	Willingness to Pay	1.197*** (0.044)	0.942*** (0.037)
	Budget Constraint	-0.205*** (0.044)	-0.221*** (0.037)
	Income Full-Time	0.439*** (0.073)	0.237*** (0.060)
	Income Part-Time	0.342*** (0.079)	0.171*** (0.065)
	Out of Job Market	0.397*** (0.083)	0.174*** (0.067)
	Students	0.137 (0.093)	0.035 (0.075)
Taste for Music	Passion for Music	1.034*** (0.070)	0.487*** (0.050)
	Ln(Hours per week)	0.299*** (0.028)	0.155*** (0.024)
Personal Charac.	Gender	-0.004 (0.044)	0.088** (0.037)
	Ln(Age)	0.330*** (0.056)	0.110** (0.047)
Country Specific Characteristics	Europe	0.854*** (0.084)	0.650*** (0.072)
	AusiAsia	0.107 (0.076)	0.110* (0.065)
	French LO	-1.569*** (0.078)	-1.679*** (0.067)
	German LO	-0.320*** (0.081)	-0.205*** (0.067)
	Cons	-2.933*** (0.236)	-0.279 (0.189)
	Log likelihood	-6303.3694	-9125.4158
	X^2	3350.08	3561.31
	Number of obs.	11529	17550
	Prob> X^2	0.0000	0.0000
	Pseudo R^2	0.2099	0.1633

Standard Errors in Parenthesis. Level of statistical significance: ***, ** and * denote statistically significance of 1%, 5% and 10% respectively. Reference groups are unemployed

Analysis here is based on 2010 data but in 2012 according to IFPI (2013) the music industry reached an inflection point, changing to a path of revenue growth. This was based on the introduction of new formats, including streaming services and is an example of the iterative and dynamic nature of consumer demand and industry PSS. Dynamism was not dealt with in this paper as the data presented is cross-section. Besides, the evidence provided is silent on the relation between digitalization and competitiveness in developing countries. Overall, future research must analyse how PSS transforms and evolves over time and with changing contexts and consumer demand. In particular future studies should analyse how the PSS has changed since 2010, and look for insight into the success of strategy based upon PSS offer and economic, legal and infrastructure developments across different types of counties over time.

REFERENCE LIST

1. Baines, T. S., Lightfoot, H. W., Evans, S., Neely, A., Greenough, R., Peppard, J., ... & Wilson, H. (2007). State-of-the-art in product-service systems. *Proceedings of the Institution of Mechanical Engineers, Part B: Journal of Engineering Manufacture*, *221* (10), 1543-1552.
2. Bustinza, O. F., Vendrell-Herrero, F., Parry, G., & Myrthianos, V. (2013a). Piracy and music business models. *Industrial Management and Data Systems*, *113* (1), 4-22.
3. Bustinza, O. F., Perez-Arostegui, M. N., & Ruiz-Moreno, A. (2013b). Organizational culture focused on quality management and benefits derived from an ERP system implementation. *Intangible Capital*, *9* (1), 126-152.
4. Bockstedt, J., Kauffman, R. J., & Riggins, F. J. (2005). The move to artist-led online music distribution: explaining structural changes in the digital music market. In *System Sciences, 2005. HICSS'05. Proceedings of the 38th Annual Hawaii International Conference on* (pp. 180-195). New York: IEEE.
5. Chesbrough, H., & Rosenbloom, R. S. (2002). The role of the business model in capturing value from innovation: evidence from Xerox Corporation's technology spin-off companies. *Industrial and corporate change*, *11* (3), 529-555.
6. Djankov, S., La Porta, R., Lopez-de-Silanes, F., & Shleifer, A. (2002). The regulation of entry. *Quarterly journal of Economics*, *117* (1), 1-37.
7. European Commission. (2011). Meeting the challenge of Europe 2020: the transformative power of service innovation. Report by the Expert Panel on Service Innovation in the EU.
8. Greenstein, S. (2011). Digital dark matter. *Micro, IEEE, 31* (1), 128-128.
9. IFPI (2013). Recording industry in numbers. The recorded music market in 2012. http://www.ifpi.org/content/section_resources/rin/rin.html
10. Informa Telecoms & Media (2011). Universal Music Group reasserts its recorded-music dominance in 2010, last modified 23th March 2011, http://musicandcopyright.wordpress.com/2011/03/23/universal-music-group-reasserts-its-recorded-music-dominance-in-2010/
11. Koukova, N. T.; Kannan, P. K.; Kirmani, A. (2012). Multiformat digital products: how design attributes interact with usage situations to determine choice. *Journal of Marketing Research*, 49 (1): 100-114.
12. Liebowitz, S. J., & Watt, R. (2006). How to best ensure remuneration for creators in the market for music? Copyright and its alternatives. *Journal of Economic Surveys*, *20* (4), 513-545.
13. Myrthianos, V., Vendrell-Herrero, F., Parry, G., & Bustinza, O. F. (2014). Firm profitability during the servitization process in the music industry. *Strategic Change*, *23* (5-6), 317-328.
14. Neely, A. (2008). Exploring the financial consequences of the servitization of manufacturing. *Operations Management Research*, *1* (2): 103-118.
15. Neely, A. (2010). *The servitization of manufacturing: innovation in business models*. Cambridge: Cambridge Service Alliances.
16. Ng, I., Parry, G., Wild, P., McFarlane, D., & Tasker, P. (2011). *Complex engineering service systems: concepts and research*. New York: Springer.
17. Parry, G., Bustinza, O. F., & Vendrell-Herrero, F. (2012). Servitisation and value co-production in the UK music industry: an empirical study of consumer attitudes. *International Journal of Production Economics*, *135* (1), 320-332.
18. Parry, G., Bustinza, O. F., Vendrell-Herrero, F. (2014). Copyright and creation: repositioning the argument. *Strategic Direction*, *30* (3): 32-35.
19. Porter, M. E. (1979). The Five Competitive Forces that Shape Strategy. *Harvard Business Review*, *86* (1), 78-93.
20. Porter, M. E., & Ketels, C. H. (2003). UK Competitiveness: moving to the next stage.

21. Porter, M. E. (2004). Building the microeconomic foundations of prosperity: findings from the business competitiveness index. In: Porter ME, Schwab K., Martin HS, Lopez-Claros A. (Ed.) *The global competitiveness report*.
22. Sampson, S. E. (2012). *Essentials of service design*. Createspace: Amazon.
23. Suarez, F. F., Cusumano, M. A., & Kahl, S. (2013). Services and the business models of product firms: an empirical analysis of the software industry. *Management science*, *59* (2), 420-435.
24. Teece, D.J. (2010). Business models, business strategy and innovation. *Long Range Planning*, *43* (2-3): 172–194.
25. Tukker, A. (2013). Product services for a resource-efficient and circular economy–a review. *Journal of Cleaner Production*, in press.
26. Vargo, S. L., & Lusch, R. F. (2004). Evolving to a new dominant logic for marketing. *Journal of Marketing*, *68* (1): 1-17.
27. Vargo, S. L., & Lusch, R. F. (2008). From goods to service(s): divergences and convergences of logics. *Industrial Marketing Management*, *37* (3): 254-259.
28. Visnjic Kastalli, I., & Van Looy, B. (2013). Servitization: disentangling the impact of service business model innovation on manufacturing firm performance. *Journal of Operations Management*, *31* (4), 169-180.