

# Industrial Innovations and Creative Industries

## Empirical Evidences from Taiwan Innovation Survey

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### Abstract

The fast growth of creative industries around the world has attracted the attention of researchers in the field of economics and management, who traditionally regard industrial innovation as the driving force of economic growth. Some researchers try to investigate the contribution of creative industries to the economic growth directly; some may ask “Are creative industries related to industrial innovation of other industries?” These issues are urging and important. In this paper, we will study the interaction of creative industries and innovation in Taiwan innovation system by identifying and exploring the contributions of creative activities to the innovations of all the other industries.

We select a strictly defined manufacture sector (with 1563 samples) and identify the correlations between technology innovation and creative activities (design, packaging, and advertising) by regression models. We have control the business type (B to C, or B to B) of firm, because B to C industries usually need to advertise to end users and care about the package and aesthetic design of product. We find that product (process) innovations are significantly (insignificantly) correlated with the creative activities even we have moved away the impact of business type (B to C). We have shown that even the most rigid and least cultural-flavored industries will initiate creative activities in innovation process, and demand the services from creative industries.

**Keywords:** Industrial Innovation, Creative Industries, Innovation Survey

### Introduction

The fast growth of creative industries around the world has attracted the attention of

researchers in the field of economics and management, who traditionally regard industrial innovation as the driving force of economic growth. Some researchers try to investigate the contribution of creative industries to the economic growth directly; some may ask “Are creative industries related to industrial innovation of other industries?” These issues are urging and important. However, “*creative industries and innovation are slippery fish to handle conceptually, to say nothing of their relationship*” (Cunningham & Higgs, 2009). Fortunately, Taiwan had initiated a national survey of firm-level data on innovation according to the format of the fourth edition of Community Innovation Survey (CIS 4). The industrial innovations are well-defined and classified into technological innovation (product and process) and managerial innovation (organizational and marketing). The survey data of marketing innovation include the firms’ design, packaging and advertising activities which are unarguably related to the creative industries. Therefore, we may study the interaction of creative industries and innovation in Taiwan innovation system by identifying and exploring the contributions of creative industries to the innovations of all the other industries.

Creative industry is composed of two broad types: First, Business to Business (B to B): These types of industries include design firms, advertisers, architects, software developers, etc. Second, Business to Customer (B to C): These types of industries include film studios, radio, recording arts, television production, etc. We will focus on the B to B creative industries in this study. B to B creative industries provide tools and services which are essential for the creative activities and facilitate the industrial innovation of other manufacture or service industries.

Muller, K., C. Rammer and J. Truby (2009) have studied the role of creative industries in industrial innovation by an extensive survey of creative industries in Austria. From the responses of creative industries, they have shown that creative industries are user of innovation products of the other industries and have provided services in the innovation process of the other industries. However, they lack the direct evidences from the other industries to confirm their findings. Our paper will fill this gap by employing the innovation survey data from “the other industries”. Bakhshi and McVittie (2009) also employ the innovation survey data (CIS 4 of UK) from “the other industries”, but they did not use the information of marketing innovations as we do. They use the “design’ activity listed in technological innovation process, which is usually related to the functional change according to the CIS format. Rather, we use the “design’ activity of marketing innovations which is focused on aesthetic value and is more related to the creative industries.

The remainder of this paper is structured as follows. In Section 2, we propose the analytical method by describing the data, defining the variables and setting up the regression models. In Section 3, we present and discuss the empirical results. Section 4 concludes the paper.

## Method

### Data

The sample size of Taiwan CIS data is 10017, including 4563 manufacturers and 5454 service providers. By these samples, we select a strictly defined manufacture sector (with 1563 samples) and identify the correlations between technological innovation and creative activities (design, packaging, and advertising) by logistic regression models.

### Variables

#### *Dependent variables:*

We define three creative activities as dependent variables:

**Y1 = Design** If firm has launched aesthetic design (modify the out looking of products without changing their functions) during 2004-2006, then **Design** = 1, otherwise 0.

**Y2 = Packaging** If firm has changed the packages of products during 2004-2006, then **Packaging** = 1, otherwise 0.

**Y3 = Advertising** If firm has launched advertisements for its products during 2004-2006, then **Advertising** = 1, otherwise 0.

Among 1563 sample, there are 221 (14.1%) firms with **Design** = 1; 116 (7.4%) firms having **Packaging** = 1; and 135 (8.6%) firms having **Advertising** = 1.

#### *Independent variable:*

We identify six common independent variables to explain the three dependent variables. First group of independent variables is our main focus - technological innovation.

#### *Technological Innovation:*

**D\_INNOV**: If firm has launched product innovation (new to the market or firm) during 2004-2006, then **D\_INNOV** = 1, otherwise 0.

There are 274 (17.5%) firms having **D\_INNOV** = 1.

**P\_INNOV**: If firm has launched process innovation (new to the market or firm) during 2004-2006, then **P\_INNOV** = 1, otherwise 0.

There are 204 (13.1%) firms having **P\_INNOV** = 1.

Second group of independent variables is related to the characters of firm.

#### *Firm characters:*

**SIZE**: Firm size - The logarithm of the number of firm's employees in 2006.

**OBM:** If the firm has branding capacity  $OBM = 1$ , otherwise 0.

There are 205 (13.1%) firms having  $OBM = 1$ .

Third group of independent variables has to do with the characters of firm's market.

**Market characters:**

**MARKET:** The market scope of firm include only local market, **MARKET** = 0  
Taiwan market, **MARKET** = 1  
international market, **MARKET** = 2

**B2C :** If the main customer of firm is final customer, **B2C** = 1, otherwise 0.

There are 300 (19.2%) firms having **B2C** = 1.

**Models**

We set up the model for each dependent variables with the same independent variables (X's) as following.

$$Y_i = \alpha + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_6 X_6 + u, \quad i = 1, 2, 3.$$

We will run the Logistic regression for Y1, Y2, Y3 separately.

**Results**

The regression results of Y1, **Design** is shown in Table 1. We find that all six independent variables are significant. There are 5 variables (except **P\_INNOV**) above 0.01 level. As we expect, bigger size firm with its own brand are more likely to initiate product design; firms with broader market scope and serving the final customer need to accommodate to the specific characters of different markets, and then redesign their products. After considering these four factors of firm and market, we find that product (process) innovation is strongly (weakly) linked to aesthetic design. These findings imply the technological innovation should incorporate the creative elements in order to well serve the customers' need.

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Insert Table 1 about here  
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The regression results of Y2, **Packaging** is shown in Table 2. We find that **P\_INNOV** and **SIZE** are not significant, but the other 4 variables are still significant. Firms with their own brand, having broader market scope and serving the final customer need to change their packages of products. We find that product innovation is still strongly linked to package (above 0.01 level).

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Insert Table 2 about here  
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The regression results of Y3, **Advertising** is shown in Table 3. We also find that **P\_**  
**INNOV** and **SIZE** are not significant, but the other 4 variables are still significant. Firms with  
their own brand, having broader market scope and serving the final customer need to launch  
more advertisements for their products. We find that product innovation is still strongly linked  
to package (above 0.01 level).

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Insert Table 3 about here  
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### **Conclusion**

This study demonstrates the influences of creative industries upon innovation for  
manufacture industries by Taiwan CIS data. We have shown that even the most rigid and least  
cultural-flavored industries will initiate creative activities in innovation process. We have  
control the size, branding, market scope and business type (B2C) of firm, because B to C  
industries usually need to advertise to end users and care about the package and aesthetic  
design of product. We find that product (process) innovations are significantly (insignificantly)  
correlated with the creative activities even we have moved away the impact of firm and  
market characters. These evidences imply the technological innovations of the manufacture  
industries demand the services from creative industries.

Many countries, Taiwan included, provide huge amount of funding for industrial innovation  
to drive the economic growth. We have demonstrated that creative services are fundamentally  
linked to industrial innovation. These evidences provide a valid argument for continued and  
increased government funding of creative industries.

### **Reference**

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**Table 1 Logistic Regression Results of Y1, Design**

	Coefficient	S.E.	Wald	P-value	Exp(B)
D_INNOV	0.922	0.175	27.610	0.000	2.514
P_INNOV	0.370	0.198	3.483	0.062	1.447
SIZE	0.177	0.069	6.566	0.010	1.193
OBM	0.761	0.191	15.907	0.000	2.141
MARKET	0.630	0.161	15.357	0.000	1.878
B2C	0.782	0.177	19.486	0.000	2.186
Constant	-4.343	0.424	105.021	0.000	0.013

**Table 2 Logistic Regression Results of Y2, Packaging**

	Coefficient	S.E.	Wald	P-value	Exp(B)
D_INNOV	0.742	0.229	10.523	0.001	2.099
P_INNOV	0.142	0.263	0.290	0.590	1.152
SIZE	0.130	0.088	2.163	0.141	1.139
OBM	0.461	0.249	3.420	0.064	1.586
MARKET	0.695	0.214	10.545	0.001	2.005
B2C	0.927	0.216	18.417	0.000	2.526
Constant	-4.845	0.552	76.940	0.000	0.008

**Table 3 Logistic Regression Results of Y3, Advertising**

	Coefficient	S.E.	Wald	P-value	Exp(B)
D_INNOV	1.025	0.208	24.347	0.000	2.788
P_INNOV	0.352	0.234	2.256	0.133	1.422
SIZE	0.084	0.082	1.064	0.302	1.088
OBM	0.434	0.232	3.503	0.061	1.544
MARKET	0.577	0.196	8.675	0.003	1.781
B2C	0.608	0.214	8.078	0.004	1.837
Constant	-4.274	0.500	72.983	0.000	0.014