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The Topic:

**Intellectual Capital and
Knowledge Productivity:
The Taiwan Biotech Industry**



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Present Content

1. Introduction



2. Literature Review

3. Research Methods

4. Conclusion





1. Introduction

- 💡 **The world is fast moving from a production-based economy to a knowledge-based one (Drucker, 1993; Powell and Snellman, 2004).**
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1. Introduction


- 🔑 **Drucker (1999b) states that the most important contribution management needs to make in the 21st century is similarly to increase the productivity of knowledge work and the knowledge worker.**
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1. Introduction


- ☛ **Therefore, the ability of firms to generate and exploit new forms of knowledge is vitally important (Anand *et al.*, 2007).**



1. Introduction



 **The economic challenge of the post-capitalist society will therefore be the productivity of knowledge work and the knowledge worker (Drucker, 1993).**





1. Introduction

- 💡 **Knowledge productivity is a tricky construct.**







1. Introduction

- 🔗 **Some scholars adopt a macro-economic perspective to interpret knowledge productivity as a result (Machlup, 1972),**
 - 🔗 **while others apply a managerial perspective to interpret knowledge productivity as a human ability (Drucker, 1981; Drucker, 1993; Drucker, 1999b).**
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1. Introduction

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- 🔗 **This study integrates both perspectives to define knowledge productivity as the capability with which individuals, teams, and units across an organization achieve knowledge-based improvements, exploitation, and innovations.**
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1. Introduction

- 💡 **Drucker (1999b) argued that knowledge-worker productivity will be the biggest managerial challenge of the 21st- century, and in developed countries, a first requirement for mere survival (p. 157).**
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1. Introduction

- 🔗 **Knowledge productivity did not receive much attention until knowledge researchers began to explore a theory of knowledge productivity.**
 - 🔗 **Furthermore, in the existing academic literature, little is known as to how new knowledge is created, and empirical work is particularly lacking.**
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1. Introduction

- 🔍 **Drucker (1993) argued that making knowledge productive is the responsibility of management and requires a systematic and organized application of knowledge to knowledge (p. 190).**
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1. Introduction

- 💡 **It is known that organizations adopt different approaches for accumulating and utilizing their knowledge, and that these approaches present themselves as different aspects of intellectual capital, i.e., human, organizational, and social capital.**





1. Introduction

- 🔗 **It is also widely accepted that an organization's capability to innovate is closely tied to its intellectual capital (Tsai and Ghoshal, 1998; Subramaniam and Venkatraman, 2001; Subramaniam and Youndt, 2005).**
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1. Introduction

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- ❁ **Previous studies have revealed that intellectual capital is positively and significantly related to organizational performance. Recently, there has been increasing research focused on the relationships among intellectual capital, innovation, and competitiveness.**
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1. Introduction

- 🧠 **On the other hand, the interaction between innovation and knowledge management or intellectual capital has also been studied.**







1. Introduction

- 🔑 **In this context, the dimensions of intellectual capital are interactive, transformable, and complementary activities, meaning that a resource's productivity may be improved through investments in other resources.**
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1. Introduction

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- 👁 Numerous researchers have studied the relationships among intellectual capital, innovation, and competitiveness, but few studies have explored the relationship between intellectual capital and knowledge productivity, which is the primary aim of this study.
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1. Introduction

The objectives of this study are:

(1) to examine the relationship between intellectual capital components and knowledge productivity

(2) to study interactive effects between intellectual capital components and knowledge productivity.



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2. Literature Review



2. Literature Review

Knowledge Productivity

There are two different interpretive perspectives:

(1) Machlup's Perspective

(2) Drucker's Perspective



2. Literature Review

Machlup's (1972) perspective, based on economic theory, interpreted knowledge productivity as a result, aimed at explaining.

These conclusions drew attention to the relationships between knowledge, value creation, and economic growth.



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2. Literature Review

Drucker's perspective, based on managerial theories, interpreted knowledge productivity as an organizational ability and aimed at improving the knowledge-based production process.



2. Literature Review

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- **Subsequently, Harrison and Kessels (2004) proposed that “knowledge productivity concerns the way in which individuals, teams and units across an organization achieve knowledge-based improvements and innovations” .**
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2. Literature Review

- 🔗 **Stam (2007) argued that “knowledge productivity refers to the process of transforming knowledge into value”.**







2. Literature Review

- 🔗 This study defines **knowledge productivity** as the capability with which individuals, teams, and units across an organization achieve knowledge-based improvements, exploitation, and innovations.
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2. Literature Review

Key Knowledge Productivity Factors:

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- **Drucker (1999a) highlighted six major factors which determine knowledge-worker productivity. These were **task, autonomy, continuous innovation, continuous learning and teaching, quality,** and treating the knowledge worker as an asset rather than a cost (p. 142).**
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2. Literature Review

Key Knowledge Productivity Factors:

- 📌 Harrison and Kessels (2004) argued for the “**Corporate Curriculum**”, which involves “transforming the daily workplace into an environment where learning and working can be effectively integrated.

2. Literature Review

Key Knowledge Productivity Factors:

- Stam (2007) proposed the **knowledge productivity (KP) enhancer**, that includes **acquiring subject matter expertise**, **learning to identify and solve problems**, **cultivating reflective skills**, **securing communication skills**, **acquiring skills for self regulation of motivation**, **promoting peace and stability**, and **causing creative turmoil in order to stimulate innovation**.

2. Literature Review

Key Knowledge Productivity Factors:

- Based on the above literature, scholars have mainly suggested **human resource and organizational structure approaches**.
- We know that above all, making knowledge productive is a managerial responsibility. It requires a systematic and organized application of knowledge to knowledge (Drucker, 1993).**

2. Literature Review




Key Knowledge Productivity Factors:

- It is known that organizations adopt different approaches for **accumulating** and **utilizing** their knowledge, and that these approaches present themselves as different aspects of **intellectual capital**, i.e., **human**, **organizational**, and **social capital** (Davenport and Prusak, 1998; Nahapiet and Ghoshal, 1998).



2. Literature Review



Key Knowledge Productivity Factors:

-  The concept of intellectual capital is based on the belief that the **main resources** for **building competitive advantage** are **intangible** in nature (Edvinsson and Malone, 1997; Stewart, 1997; Sveiby, 1997).
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2. Literature Review

Key Knowledge Productivity Factors:

- ☛ Therefore, this research introduces a theory of **intellectual capital**, and explores its influence on **knowledge productivity**.
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2. Literature Review


**Intellectual Capital and Knowledge
Productivity**








2. Literature Review

Hypothesis 1:

 *The greater the human capital in organizations, the higher the knowledge productivity.*

Hypothesis 2:

 *The greater the organizational capital in organizations, the higher the knowledge productivity.*





2. Literature Review

Hypothesis 3:

- 👁 *The greater the social capital in organizations, the higher the knowledge productivity.*







2. Literature Review

Moderating Effect of Social Capital

Hypothesis 4:

The greater social capital in organizations, the stronger the influence of human capital on knowledge productivity.





2. Literature Review

Moderating Effect of Social Capital

Hypothesis 5:

The greater social capital in organizations, the stronger the influence of organizational capital on knowledge productivity.



The background features a light-colored, textured surface with faint, large-scale patterns. On the left side, there are several decorative elements: a cluster of interlocking gears in the top-left corner, a small inset image of a man in a suit sitting at a desk with a laptop in the middle-left, and a rolled-up document with a pen resting on it in the bottom-left corner.

3. Research Methods

The background features a light-colored, textured surface with faint, large letters 'S', 'C', 'X', and 'Y' scattered across it. In the top-left corner, there are several interlocking gears of different sizes. In the bottom-left corner, there is a small inset image of a man in a suit sitting at a desk with a laptop, and below it, a rolled-up document with a pen resting on it.

3.1 Research Framework

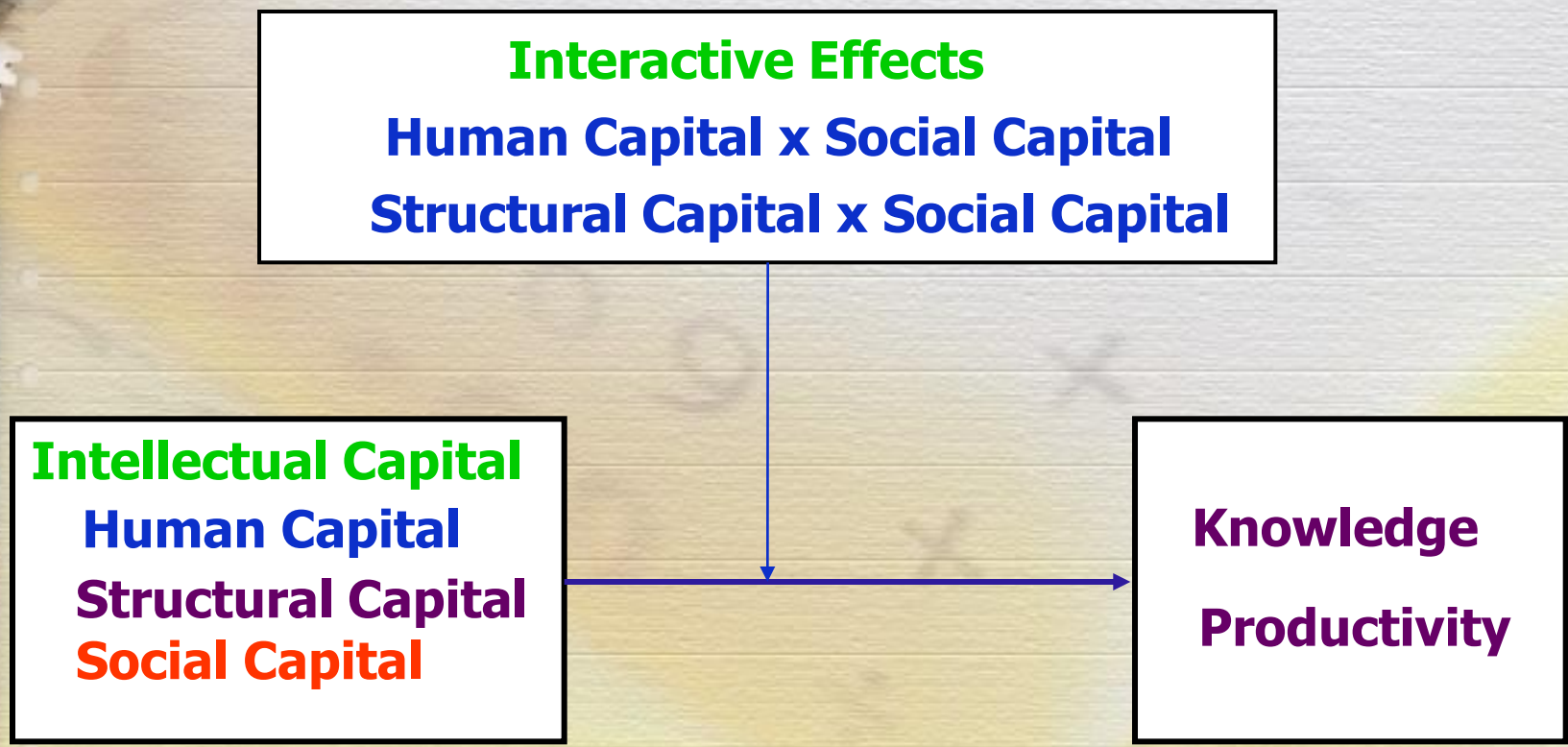




Fig. 1 Conceptual Structure for this Research



3. Data Collection

Intellectual capital and knowledge productivity both reside at the **organizational level** and require **“strategic awareness”** from informants to respond to questionnaires such as that used in this study.





3. Data Collection

- 💡 **Drucker (1993) emphasized that “a manager is one who is responsible for the application and performance of knowledge” (p. 44).**
- 💡 **Drucker (1993) argued that the function of organizations is to make knowledge productive (p. 49).**



3. Data Collection

- 💡 **Based on this organizational focus, this study selected managers of R&D departments as respondents.**







3. Data Collection

The questionnaires were mailed to

- (1) members of the Taiwan Pharmaceutical Manufacturers Association (TPMA) and the Pharmaceutical Manufacturers Association of Chinese Medicine (PMACM) and**
 - (2) biotechnology firms listed in a 2005 survey conducted by the Taiwan Institute of Economic Research.**
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3. Data Collection

-  **A total of 110 questionnaires were mailed to pharmaceutical companies, 220 to Chinese medicine pharmaceuticals, and 380 to biotechnology companies.**
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3. Data Collection

A total of 113 valid responses were obtained after 6 weeks, representing a valid response rate of 15.92%. An analysis of respondents and non-respondents revealed no differences in industry membership, number of employees, or revenues.

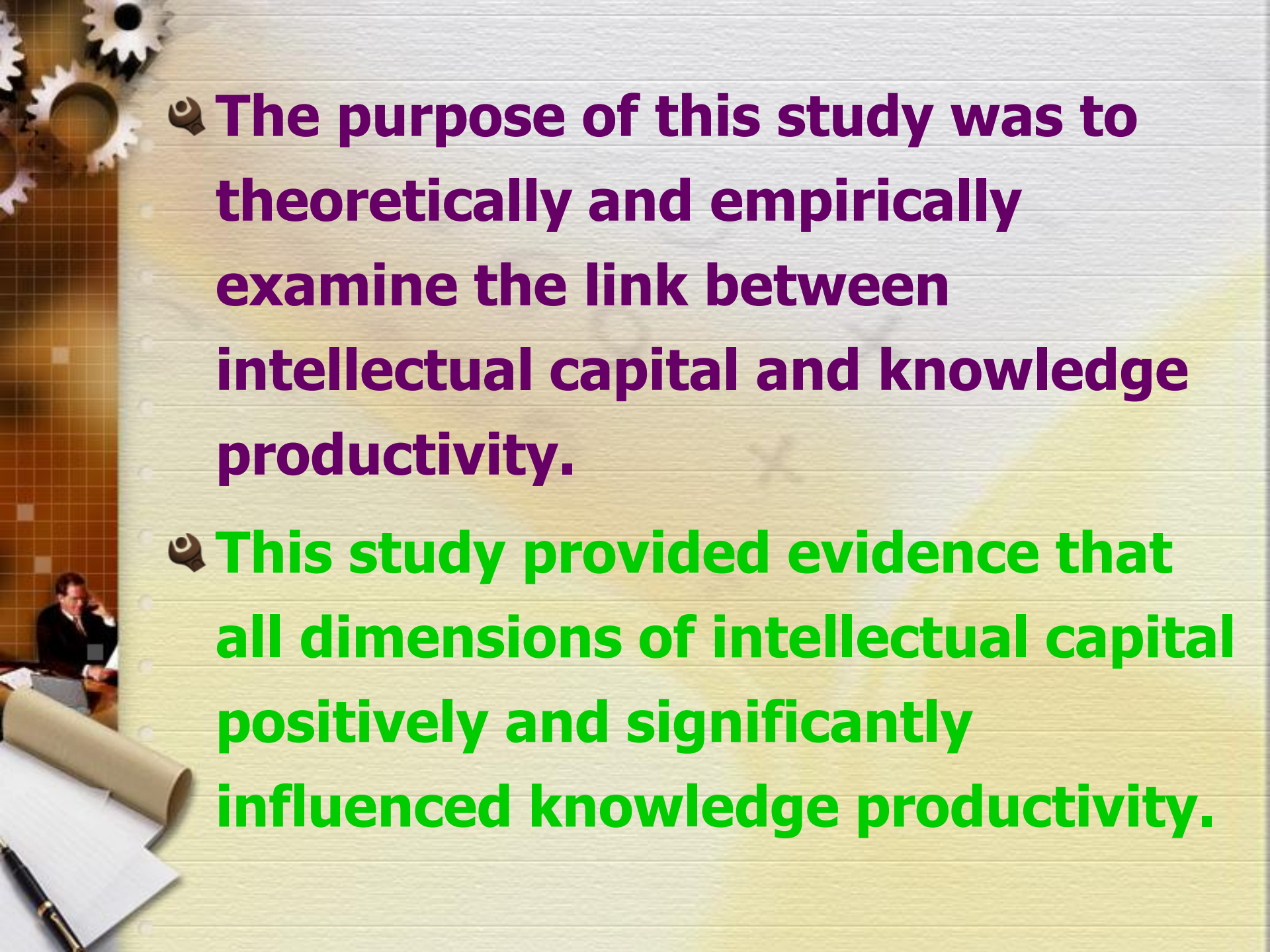




4. Conclusion


Table 3 Regression Analysis for Intellectual Capital and Knowledge Productivity (n=113)

Dependent. Variable Independent Variable	Knowledge Productivity						
	Model 1				Model 2		
	Beta	t	p.	VIF	Beta	t	p.
Taiwan Biotechnology Industry	0.330	3.658	0.000		0.303	3.428	0.001
Taiwan Pharmaceutical Manufacturers	0.243	2.998	0.003		0.226	2.813	0.006
Age	-0.005	-0.066	0.948		-0.029	-0.401	0.689
Size	0.006	0.079	0.937		0.000	-0.005	0.996
Human Capital	0.281	3.670	0.000	1.242	0.274	3.693	0.000
Organizational Capital	0.208	2.851	0.005	1.072	0.206	2.920	0.004
Social Capital	0.296	3.861	0.000	1.259	0.252	3.319	0.001
Human Capital x Social Capital					0.173	2.647	0.009
Organizational Capital x Social Capital					-0.098	-1.487	0.140
F	18.729				16.492		
Sig.	0.000				0.000		
R _a ²	0.526				0.555		
ΔR _a ²					0.029		
Sig. F Change					0.000		


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🔗 The purpose of this study was to theoretically and empirically examine the link between intellectual capital and knowledge productivity.

🔗 This study provided evidence that all dimensions of intellectual capital positively and significantly influenced knowledge productivity.




Additionally, this research found that social and human capital interaction was significantly and positively related to knowledge productivity.




However, the study found that the social and organizational capital interaction was negatively but insignificantly related to knowledge productivity.

The background features a light green and yellow gradient with faint, large letters 'S', 'O', 'X' and 'Y', 'X' scattered across it. In the top-left corner, there are several interlocking gears of different sizes. In the bottom-left corner, there is a small inset image of a man in a suit sitting at a desk with a laptop, and below it, a rolled-up document and a pen.


Implication




The social and organizational capital interaction was significantly negatively related to knowledge productivity.



A possible explanation for the lack of interaction is that, in some cases, organizational capital may actually hinder knowledge productivity.



Highly formalized processes, systems, structures, etc. have a tendency to reinforce existing norms and obviate against the variation and change that promote knowledge productivity.



Therefore, this study suggests that managers build contingent circumstances for dynamic knowledge productivity.



THE END