

國立聯合大學
經營管理學系碩士班

碩士論文

國家創新系統失靈的衡量：以能力失靈與互
動失靈為例

**Measuring the System Failures of National Innovation
System: Investigation on Capability Failures and Network
Failures**

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摘要

在全球知識經濟的脈動下，國家創新系統的組成與運作成為各國發展產業創新所關注的體制架構，如何透過國家內部不同技術創新參與者之間的知識積累、傳播與使用，進以實現知識創造、技術創新的目標。然而，在諸多創新系統失靈的現象都有可能導致國家產業創新活動產生停滯或延遲。其中，能力失靈與互動失靈代表的是系統內的不同參與者，缺乏明顯投入與產出或是互動導致整體國家產業創新活動停滯或延遲。透過能力失靈與互動失靈的檢驗，有助於了解國家創新系統組成與運作的決定性因素，作為政策制定者推動發展國家產業創新活動的參考。本研究觀察我國9個高科技產業在2002年至2017年產業技術創新活動，以發明專利申請為衡量指標，依整體產業技術增長率變化切割技術成長與衰退階段，依我國國家創新系統參與者，包括政府、高等教育、企業與個人等部門，計算專利產出與共同產出的成長率，藉由追縱資料迴歸分析，探討在技術發展不同階段，不同參與者的個別或是互動的技術創新活動變化，如何影響我國自主產業技術創新發展。研究結果發現企業與高等教育部門在國家創新系統運作是關鍵的角色，在技術成長階段的投入，能促使國家整體產業技術創新蓬勃的發展，在衰退階段，亦能達到減緩技術衰退速度的效果。再者，產學合作對於國家整體產業技術創新與各自互動部門的技術創新無論是在成長階段或是衰退階段都有正面效果。產官合作則是在整體產業技術創新發展與政府部門在衰退階段有正面效果。綜合上述，在國家創新系統運作中，不同參與者的投入與互動在國家整體產業創新發展動態中其能力失靈與互動失靈所造成的影響不同，政策制定者應依產業技術發展動態不同作用效果制定刺激產業技術創新持續發展的誘因與政策機制。

關鍵詞：國家創新系統、系統失靈、能力失靈、互動失靈

Abstract

With the rise of the knowledge economy, the composition and operation of the national innovation system (NIS) become a primary issue to facilitate knowledge accumulation, dissemination, and utilization from various actors in NIS for sustaining industrial innovation. Capabilities and network failures are typical failures in the NIS, in which the actors have insufficient engagement and interactions to lead the system failures. This study attempts to investigate critical factors in the NIS through the examinations on capabilities and network failures. We collect the filing of utility patents in nine hi-tech industries from 2002 to 2017 in Taiwan as the observation of technological innovation in the industry. In detail, we divided the industrial innovation into growth and decline periods by the growth rate of patent counts in the overall. We computed the growth rate of the actors and their interactions, including the sectors of government, industrial firms, high education, and individuals. By employing panel regression, the results indicate that the sectors of high education and industrial firms have a significantly positive effect on the industrial innovation of the domestic on both growth and decline periods. University-industrial collaboration has the same impact on the overall and each sector in the two periods. Government-industry collaboration also has a familiar influence on the overall and government sector in the decline period. In conclusion, it has various effects generated from capabilities and network failures by different actors and their interactions in the NIS, and policymakers must provide appropriate policy instruments to promote and sustain industrial innovation in the domestic.

Keyword: National innovation, System failures, Capabilities failure, and Network failure