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College of Technology Management

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《Linking Science and Technology:
Lessons from Korea and Taiwan》

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封面故事 Cover Story

Linking Science and Technology: Lessons from Korea and Taiwan

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Management

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Science is broadly defined as knowledge about nature. This knowledge is obtained via systemic research activities and has been instrumental for technological development. Science has allowed us to produce a base of knowledge that is useful for the development of different kinds of technology. Many modern technologies (e.g. biotechnology, bio-mechanical instruments) were made possible by the scientific knowledge accumulated over decades.

The human pursuit of science has indeed shaped our economic institutions and routines. Many emerging economies have strategically positioned their institution structures to be conducive towards scientific activities. Generally, these activities are coordinated to upgrade the technological competencies of their economic entities. This upgrading of technological competencies is regarded as an essential condition that allows the emergence of resilient growth (i.e. growth that is harnessed from a productive economy) and industrial development.

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Linking Science and Technology: Lessons from Korea and Taiwan

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South Korea and Taiwan are among the ‘tiger economies’ that appropriated scientific and technological knowledge for development in their post catching-up phase of industrialization (since the 1990s). Figure 1a and Figure 1b below show the production of scientific publications and patents of the two economies. The publishing and patenting trends indicate a strong correlation between basic research activities and industrial applications, hinting at a strong interaction between scientific and technological production in the respective institutional structures. It is believed that the science and technology policies of these two economies have successfully advanced a key connection – that is, from scientific knowledge producing entities to industries that produce consumer technology. For example, the publications of Korea are oriented towards industrial/medical-based applications. The advancement of technological capabilities in turn empowered science to derive technology based scientific activities (e.g. computer science, material science, etc.). This kind of two directional flow of progress has added significant value to their economic constructs and upgraded their high-tech industry production value chains.

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There are a number of studies which explore how the two economies linked scientific and technological activities to achieve resilient growth and industrial development. The following are several derived essences, which might be useful to policymakers from other economies who aspire to attain similar achievements in science and technology:

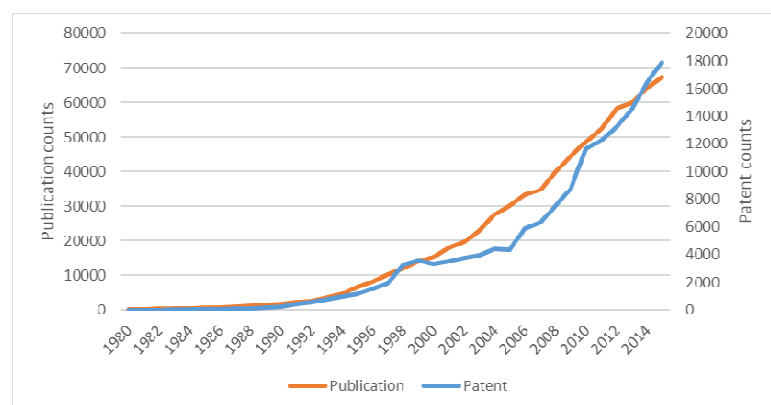
- A functional innovation system that capitalises on (local) productive activities
- Mechanisms to mobilise resources to develop indigenous technologies (that correspond to global market demand)
- Public research institutions which can play a significant role in diffusion of skills (know-how) and state-of-the-art technology
- A well-thought-out upgrading process to transform industrial entities (i.e. from traditional to science-based), in order to search for and develop niches
- With (abundant) productive activities and indigenous technologies, the state can then pursue scientific research to construct a base for science-based industries
- Universities are endowed to perform application-oriented research and provide a high quality workforce for those science-based industries

Linking Science and Technology: Lessons from Korea and Taiwan

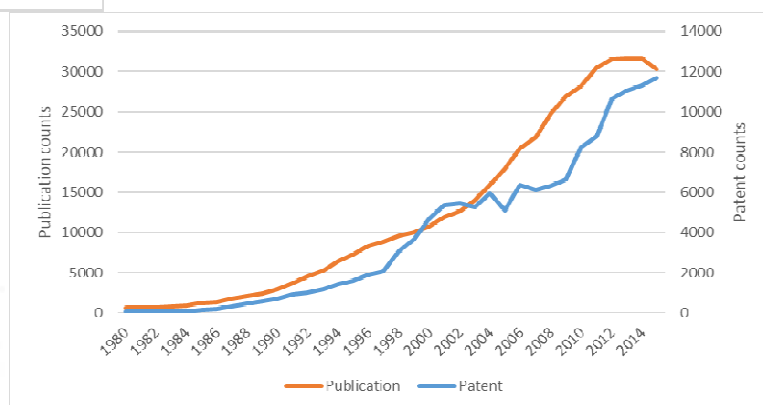
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There are many developing economies trapped in the middle income level. While they may be successful in coordinating for productive activities in their early phase of development, it is noted that not many succeeded in linking science with technology in the subsequent phase. Thus, it is worthwhile for policy makers in the developing world to consider establishing a policy learning mechanism – with the aim of studying the context (and perhaps emulating) certain strategic coordination and tactical policy executions of South Korea and Taiwan in pursuing science and technology.



a) South Korea



b) Taiwan

Figure 1: Publication and Patent Counts of South Korea and Taiwan, 1980-2015
Source: Web of Science (SCIE and SSCI) and USPTO's Utility Patents

本月風雲人物

Roll of Honor

- ◆ 科法所碩士班106級任帥同學榮獲「第三屆中華大學生十大金牌調解員技能大賽」一等獎。

SHUAI REN, student of the Institute of Law for Science and Technology, won the first place of the "The 3rd China University Students Top Ten Gold Medal Mediator Skills Competition".



- ◆ 科管所碩一黃湘芸、劉雅琪、陳祉好、李梓玟同學入選「2018台積電青年築夢計畫」。

SIANG YUN HUANG, YA CHI LIU, CHIH YU CHEN and TZU HSUAN LI students of Institute of Technology Management was selected as "2018 TSMC Youth Dream Project".



國際交流

International Events

- ◆ **2019秋/2020春全球處校級姊妹校出國交換生院內申請審查作業完成。**
Office of Global Affairs completed 2019 autumn/ 2020 spring sister school abroad exchange students' applications review.
- ◆ **法國ESSCA 2019春季班二位來訪交換生申請審查作業完成。**
French ESSCA 2019 spring class visiting exchange students applications review has been completed.
- ◆ **2018/10/30 越南科技部學術單位來訪並舉行簽約儀式。**
2018/10/30 Vietnam Institute of Science Technology and Innovation visited and signed MOU.
- ◆ **108學年度台灣聯大交換學生計畫院申請審查作業。**
The University System of Taiwan's 108 academic year exchange students' project applications.
- ◆ **2019秋季班ISEP交換學生計畫院申請審查作業。**
ISEP 2019 autumn exchange students' project applications.

活動花絮

Activity Features

◆ 2018下半年度孫運璿科技講座參與人次眾多，圓滿落幕。

The second half of 2018 Sun, Yun-Suan Science and Technology Speech attracted many attendees and ended successfully.



活動花絮

Activity Features



- ◆ **2018/10/30經濟學系楊睿中教授演講，講題：Double Machine Learning with Gradient Boosting for Treatment Effects。**
2018/10/30 Professor Jui Chung YANG from Department of Economics gave a speech. Topic: Double Machine Learning with Gradient Boosting for Treatment Effects.
- ◆ **2018/11/15計財系邀請政治大學財務管理學系張元晨教授演講，講題：Fire-Sale Channel of Industry Contagion: Evidence from the Pricing of Industry Recovery Rate。**
2018/11/15 Professor Yuan Chen Chang from NCCU Department of Finance was invited by Department of Quantitative Finance to give a speech. Topic: Fire-Sale Channel of Industry Contagion: Evidence from the Pricing of Industry Recovery Rate.
- ◆ **2018/11/29科管院學士班舉辦導師生輔導交流活動。**
2018/11/29 Double Specialty Program of Management and Technology held activities for advisors and students to exchange experiences.
- ◆ **2018/11/2科管所與政治大學共同舉辦「2018海峽兩岸科技管理學術研討會」，活動圓滿結束。**
2018/11/2 Institute of Technology Management and National Chengchi University co-hosted “2018 Cross-Strait Science and Technology Management Symposium”.

活動花絮

Activity Features



- ◆ 2018/10/18科法所邀請華亞協和法律事務所陳重言律師演講，講題：實踐法治國刑事法環境的律師事務所－刑事法學與司法實務的交互作用。
2018/10/18 Institute of Law for Science and Technology invited Lawyer Chong Yan Chen from Chascord law firm to give a speech.
- ◆ 2018/10/23服科所邀請大山北月創辦人莊凱詠演講，講題：大地藝術季的遇見與延續。
2018/10/23 Institute of Service Science invited founder Kai Yong Jhuang from Big Hill North Moon to give a speech.
- ◆ 2018/10/31 IMBA邀請經濟部中小企業處林口創新園提供在台外籍生創業補助計畫說明會。
2018/10/31 IMBA invited the Small and Medium Enterprise Administration, Ministry of Economic Affairs, to provide a seminar on foreign students entrepreneurship project.
- ◆ 2018/10/19 IMBA外籍生舉辦中國年畫工作坊。
2018/10/19 students of IMBA held Chinese New Year Painting Workshop.
- ◆ 北京清華EMBA已於2018/11/8～11/11至清華訪學，兩岸EMBA學生交流熱絡，四天的來訪順利圓滿。
2018/11/8～11/11 Beijing Tsinghua EMBA came to Taiwan Tsinghua for the exchange of experience.
- ◆ EMBA商管聯盟鐵馬環島論劍已於2018/10/20～10/28完賽，參加選手皆順利完成環島挑戰。
2018/10/20～10/28 The participants of “EMBA bicycles around Taiwan” all completed the challenge successfully.

活動花絮

Activity Features



- ◆ 2018/12/18學生職涯辦公室至和泰汽車企業參訪、2018/12/19中國信託企業參訪。
Office of Career Development corporate visiting activities:
2018/12/18 Hotai Motor Co., Ltd. and 2018/12/19 CTBC Bank Co., Ltd.
- ◆ 2018/12/20凱基證券企業徵才。
2018/12/20 KGI Securities Co., Ltd Job Fair
- ◆ 2018/12/13科管所的研發管理課程的學生至工研院企業參訪。
2018/12/13 Students of R&D management course of Institute of Technology Management went to ITRI corporate visiting.
- ◆ 108學年度EMBA/MBA/ MFB/MPM招生簡章已於10底開放下載，網路報名日期：2018/12/14～12/24。
108 academic year's EMBA/MBA/ MFB/MPM enrollment brochure became available to be download at the end of October. Online registration date: 2018/12/14～12/24.
- ◆ 2018/12/22服科所舉辦【The future of X 服務科學論壇】，歡迎踴躍報名參加。
2018/12/22 Institute of Service Science will hold 【The future of X Service Science Forum】 , welcome to sign up.
- ◆ 科法所將2018/12/11日舉辦研習會「Advancing Innovation in the Era of AI and Blockchain：The Role of Law and Policy」，邀請美國加州大學柏克萊分校享譽國際的美國頂尖智財學者Prof. Robert Merges以及Prof. Mark Cohen進行主題演講。
2018/12/11 Institute of Law for Science and Technology held a seminar on “Advancing Innovation in the Era of AI and Blockchain: The Role of Law and Policy”. Prof. Robert Merges and Prof. Mark Cohen from the University of California, Berkeley gave a keynote speech.

活動花絮

Activity Features



IMBA外籍生舉辦中國年畫工作坊

Students of IMBA held Chinese New Year Painting Workshop.



學生生涯辦公室舉辦金融業前瞻座談暨徵才說明

Office of Career Development: Finance Industry Symposium & Job Fair