



Information economy and inequality: Wage polarization, unemployment, and occupation transition in Taiwan since 1980

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ABSTRACT

This paper examines whether Taiwan's economic inequality has worsened as Taiwan has evolved into an information economy, a transformation which began around 1980. The paper explores this relationship by investigating three specific research questions. First, has there been a rise in wage inequality in Taiwan since 1980; and if so, what are the sources of this rise in inequality? Second, has the transition to an information economy contributed to a rise in unemployment rates? And third, what type of occupational structural transformation occurred during this transition? The paper shows that since 1980, wage inequality, unemployment, and the white-collar–blue-collar worker employment ratio have all sharply increased in Taiwan. Furthermore, the reasons for these changes seem closely related to the relative growth of the information economy.

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1. Introduction

Researchers have often pointed out that the development of an information economy results in increasing economic inequality and polarization of social classes (Castells, 2004; Machin, 2003; Victor & Stephens, 1999). This paper seeks to identify these changes during the transition to an information economy in Taiwan.

Taiwan has been investing heavily in informatization and the development of information and computer technology (ICT) industries since the 1980s to seize global opportunities and to counter competitive threats (Chou, 1998; Wang, 1999; Zhang & Wang, 1994). Taiwan is said to have entered the group of global ICT production economies soon after 1980 (Ho & Lo, 2002; Lin, 2004; Tsai, 2005). Such economies are defined as those that highly stress the production, distribution, application, consumption, and trade of ICT products as well as information and knowledge itself (Dordick & Wang, 1993; Hearn, 2004; Machlup, 1962; Porat, 1977). Based on these developments, this paper focuses on labor market transformation issues regarding inequality in Taiwan since 1980. Three main questions are examined. First, was there a rise in wage inequality? If so, what caused this increase? Second, did unemployment rates go up during the transition to an information economy? Third, has any occupation structure transformation occurred that can be traced to the transition? The last and also most importantly, what initiated these changes?

To answer these questions, this paper applies the Theil statistics to track the trend of Taiwan's wage inequality after evolving into an information economy in Section 4.1. By decomposing characteristics of the Theil statistics, it can also help recognize the sources of the inequality. In Section 4.2, the paper further tracks how the increasing inequality was caused by

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examining wage disparity at three perspectives: wage inequality among industries, among occupations, and among different education levels. Sections 4.3 and 4.4 continue discussing the trends of unemployment and occupational transformation under information economy and also explores the relevant reasons for that. Section 5 presents three empirical regression models to find out the determinants of the three above-mentioned labor market changes in the age of information economy. Additional components include Section 1, the introduction, Section 2, the information economy of Taiwan, Section 3, informatization of labor in Taiwan, and Section 6, the conclusion.

In short, by examining labor market variations, this paper will investigate whether and how the transformation to an information economy has actually affected economic inequality in Taiwan.

2. The information economy of Taiwan

To understand the trend of Taiwan's economic evolution to an information economy, we can observe the data comparing the sectoral percentage to the total GDP over time. Table 1 provides this data. As we can see, there has been a consistent increase of information intensive industry in the total GDP; the percentage of information intensive industry to the total GDP has grown from 1981 when it represented 30.6% to 2006, when information intensive industry composed 52.5% of the total. It surpassed labor intensive industry in 1994 (42.3% vs. 42.1%). In contrast, the percentage of labor intensive industries dropped from 55.2% to 33.4%, and capital intensive industries remained at almost the same level, dropping only slightly from 14.3% to 14.1% between 1981 and 2006. The industrial and economic transition to information intensive industries was generally acknowledged to be initiated at the beginning of the 1980s but not completed until the first half of the 1990s (Chu, 2003); from Table 1 we can clearly see this relative conversion.¹

Furthermore, to what extent does Taiwan's economic informatization currently reach? According to the Department of Industrial Technology, R.O.C. (2006), the production automation rate in Taiwan was 75.0% in 2006 and the use of computers in all business sectors was 93.5% in 2004. The average percentage of Internet use in all companies was 86.1% in 2005. Worldwide indices of information economies also indicate Taiwan's informatization level. According to the 2008 Information Technology Industry Competitiveness Index of the Economist Intelligence Unit (EIU) (2008), Taiwan's overall scores ranked it second in the world for IT competitiveness. Another important indicator, the World Economic Forum's (2007) Networked Readiness Index 2006–2007, ranked Taiwan 13th in the world, one place behind Hong Kong but one place before Japan, and three places before Germany. Similarly, on the International Telecommunication Union's (ITU) "Digital Opportunity Index" (DOI) in 2005, Taiwan ranked sixth in the world; and in ITU's 2004 "Digital Access Index" (DAI), Taiwan ranked ninth ("Telecommunications statistics," 2007). According to the ITU data, Taiwan scored high across the board on all measures of the deployment of ICTs. Taiwan's global rankings for ICT service penetration rate in 2003 were as follows: mobile telephony, 2nd; Internet access, 5th; broadband access, 5th; and local telephony, 17th ("Telecommunications statistics," 2007). Taiwan placed in the top two or three NICs for the extent of informatization and compared very favorably to high income countries. As measured by the contribution of information intensive industries to the total GDP, by the penetration of ICTs, and by information economy indices, Taiwan has clearly made the transition to an information economy. The penetration of ICTs and information is broad across the economy and within most industries and corporations.

3. Informatization of labor in Taiwan

As for labor informatization, according to a 2005 survey of the Directorate-General of Budget, Accounting and Statistics, R.O.C. (the GBAS) (2005), the average percentage of employees' use of computers at work in Taiwan was 75.6%. The highest use rate was for professional workers (93.6%), and the second and third highest were for clerks (91.4%) and managers (83.8%). Among service workers, 54.8% used computers. Workers in agriculture, forestry, and fishing had the lowest rate (25.1%); and the second lowest ranking was held by elementary workers (labor workers) and machine operators (37.4% and 37.6%, respectively). If we analyze these data by industry, public administration was the highest, with a usage percentage of 95.8%, and finance and insurance was second with a rate of 95.2%. The lowest rate was in the field of agriculture, forestry, and fishing, at 32.9%; and the field of accommodation and food service had the second lowest rate, 41.4%.

If we analyze the computer use rate at work by monthly income, there is a positive relationship; that is to say, the higher the income, the higher the rate of computer use at work. A correlation reveals that income level and computer use were significantly related, with $r = +0.94$, $n = 10,177$, $p < .01$, two tails. The only exception was the group with the highest income (monthly income > \$3030) whose computer use rate (83.2%) was lower than that of the second highest income group (monthly income between \$2424 and \$3030), whose computer use rate was the highest (90.1%). The lowest use rate was found in the group with the lowest monthly income (<\$480), whose average rate was 49.8%.

¹ This calculation was based on OECD's (OECD, 1996, 2001) definition of knowledge/information intensive industries. They includes mainly two sections—the information intensive manufacturing and the information intensive services. The information-centered manufacturing includes high-tech industries such as aerospace, computer and data processing equipment, automation equipment, pharmaceuticals, telecommunication, semiconductors, scientific instruments, and middle-tech industries such as automobiles, electrical equipment, specialty chemical, machinery and other transport equipment. The information-centered service industries include finance, insurance, real estate, commercial services (including computer software, computer and data processing, research and development, engineering services), professional, scientific and technical services, social and personal services, education, medical service, transport, storage, and communication.

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