2023-1324 IJOI
https://www.ijoi-online.org/

THE HIDDEN COST OF KEEPING OUTDATED INDUSTRIES: LOWER FERTILITY AND SLOWER ECONOMIC GROWTH

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Abstract

In an attempt to prevent obsolete industries from relocating to other countries, governments have implemented various policies, including exchange rate depreciation, lowered interest rates, and export subsidies. This study reveals a negative correlation between the dependency ratio and economic growth, which initially increases and then declines. The garment industry serves as the empirical subject of this research.

The study further illustrates that the Four Asian Tigers are grappling with the same issue as Japan. Retaining policies in outdated industries by governments can lead to an initial surge in domestic economies, followed by a downturn. Hence, when governments resort to shortsighted policies, similar to those adopted by Japan, South Korea, and Taiwan, their economies experience a cycle of initial growth and subsequent decline.

Keywords: Factor Movements, FDI, Policy Making, Birthrate, Demographics, GDP.

Introduction

Sustainable development is crucial for any nation, making the accuracy of public policies immensely important. Many studies on sustainable development have been conducted, with sustainability assessments frequently employed to monitor these policies (Hilley & Sim, 2020; Hopwood et al., 2005). The equilibrium between ecological sustainability and a country's economic growth is a crucial aspect of sustainable development, assessed through three primary indicators: economic, environmental, and social dimensions (Pinto et al., 2020; Hilley & Sim, 2020).

Economic decisions are invariably intertwined with societal and political factors. Determining value is about setting priorities and crafting action plans. Unfortunately, the rational choices made by economists in fundamental economic terms often fail to align with public expectations. In reality, government actions are typically not guided by value considerations, but rather by efforts to match the general expectations of their citizens. National values are historically formed and evolved.

Asia has the highest proportion of the aging population globally, with Japan having the oldest demographic (Abeywardhana, 2019). Here, the term 'oldest' refers not to a long history but to the advanced age structure of the population. As per the Statistics Bureau of Japan in 2021, the proportion of Japanese people over 65 has reached 29.1% and continues to rise. The elderly population in Japan overtook the youth population in 1995. Since then, the disparity between the elderly and the young has grown, with the working-age population continuing to shrink.

This issue can be traced back to the production factors in economics: land, labor, and capital, which constitute the resources used for production. The aging society has triggered a labor shortage, leading these economies to gradually transition into capital-intensive industries. To stabilize the economy and ensure the survival of domestic businesses, governments frequently resort to policies like low-interest rates or exchange rate depreciation.

From a production factor perspective, Japan, facing an aging population and escalating land prices, has had to evolve into a capital-intensive industry. Industries developed with low-cost labor and land began to shift to the so-called Four Asian Tigers: Singapore, Hong Kong, South Korea, and Taiwan. These four nations have also swiftly transitioned from agricultural and light industry countries into emerging economies, following Japan's lead. From 1995 to 2020, based on per capita GDP, Singapore experienced a 2.35-fold increase from US$24,937 to US$58,484; Hong Kong grew 1.92 times from US$23,497 to US$45,176; South Korea increased 2.48 times from US$12,337 to US$30,644; Taiwan increased 2.20 times, from US$12,918 to US$28,383. All these four economies grew by more than double. An interesting phenomenon occurred during this time; after the economic growth of the Four Asian Tigers, they began to face the same demographic challenge as Japan - an increasingly aging population and dwindling demographic dividend, which in turn impacted economic growth.

Previous studies on the economic impacts of an aging population, such as An and Jeon (2006), revealed that population aging has an inverted U-shaped relationship with economic growth, which first increases and then decreases. Mitra and Abeding's (2020) empirical study found that long-term population aging will decrease Japan's FDI inflows. Japan's bubble economy burst in 1991, and the Nikkei 225 Index fell below 20,000 points in March 1992, just half of its peak in 1989.

Since then, the Japanese government has been actively seeking ways to reinvigorate the economy. The most

notable among these attempts is "Abenomics," proposed by Japanese Prime Minister Shinzo Abe in 2012. Abenomics primarily refers to his policy trifecta, characterized as follows: The first arrow represents the implementation of a monetary policy based on quantitative easing. The second arrow is fiscal policy, and the third arrow is structural reform. Under Abe's economic policies, Japan's nominal GDP has increased, but its real GDP growth rate has not ascended as anticipated. In 2019, compared to other Asian countries, Japan ranked better only than Hong Kong, placing it second from the bottom.

In 1986, Japan's global export ratio peaked at 9.84%, and then it started to decline. By 2019, it dropped to 3.65%, less than 40% of its peak. After 2011, the rankings for GDP growth rate per capita have been China, Southeast Asian countries, the Four Asian Tigers, and Japan. Due to the negative growth experienced by Hong Kong and Singapore in 2019, Japan's average GDP per capita became the worst among them, and the region's economic growth has been cyclical. This phenomenon can be elucidated by the "flying geese" theory proposed by Japanese scholar Kaname Akamatsu in 1935 to illustrate the economic and industrial structural shifts in East Asian countries.

Literature Review

Most previous studies believe foreign direct investment and import and export trade are the main factors affecting a country's economic growth (Helpman et al., 2004; Hsiao et al., 2006; Chowdhury and Mavrotas, 2006). The biggest crisis facing Asian countries is the problem of declining fertility rates. The demographic changes caused by the declining fertility rate will also change the dependency ratio, which will affect the country's economic growth. The following is a description of the relevant literature.

Dependency Ratio

According to international trade theory, if a country's comparative advantage lies in labor-intensive factors of production, the country will export labor-intensive goods. Therefore, an increase in the country's employment-population will drive its economic growth. The Four Asian Tigers are also grappling with the issue of population aging and a rising dependency ratio. In classical economics, labor is considered one of the factors of production. Thus, if a country is facing an increased dependency ratio, it signifies that the problem of population aging is intensifying. Prior studies have demonstrated the relationship between the dependency ratio and a country's economic growth. Armeanu et al. (2018) found a negative correlation between the old-age dependency ratio and sustainable economic growth. An and Jeon (2006) illustrated an inverted U-shaped relationship that first increases and then decreases. The aging dependency ratio has a negative and nonlinear correlation with economic growth (Leitão and Capucho, 2021; Rahman et al., 2020). Based on this, we put forward the following hypothesis:

H1: The dependency ratio will have a negative correlation with economic growth, exhibiting an inverted U-shaped relationship that first rises and then falls.

The Impact of FDI on Economic Growth.

Foreign Direct Investment (FDI) flows from capital exporting countries' disadvantaged industries to the host country's advantaged industries. Dunning (1988) and Kojima (1973) noted that Asian FDI depends on firms' ownership, location, internalization advantages, and the internalization of intangible assets. High-income countries attract FDI due to their developed infrastructure, while labor in low-income countries is also appealing (Popovici et al., 2021). Ridzuan et al. (2017) empirically demonstrated the relationship between FDI and the environment, considering factors like financial resources, technology (including new technology and management), and human resources (including the salary and quality of staff) of the host country. Nguyen et al. (2019) highlighted the impact of government policy on enhancing FDI, given that FDI can be sustainable in a developing host country.

FDI allows the invested country to reap the benefits of economic growth. By gathering funds for the private sector, through technology transfer and the accumulation of human capital, a country's import and export trade will likely increase. Bernard et al. (2003) showed that import and export trade can have a redistributive effect on different industries, which in turn impacts the country's economy. FDI and international trade significantly benefit a country's economic growth, especially for export-oriented countries. The country's central bank often adopts a policy of devaluing its currency to maintain export competitiveness. However, while boosting export competitiveness, the country will also increase the domestic consumption level due to the rise in the cost of imported goods, leading to domestic inflation and a negative impact on economic growth. Therefore, we propose the following hypotheses:

H2: FDI and economic growth have a positive correlation in export-oriented countries.

H3: An increase in exports is positively correlated with economic growth, while an increase in imports is significantly negatively correlated with economic growth in export-oriented countries.

Industrial Structure Changes And Economic Growth

Kojima (1977) contended that technology was transferred from Japan and the United States to Korea's manufacturing industries through direct foreign investments or licensing. However, technological progress has diminished the advantages of the original production factors, prompting foreign manufacturers to reinvest in Southeast Asian countries with competitive advantages (Mahadevan and Suardi, 2008). Cristea et al. (2021) demonstrated that the young unemployed are the most vulnerable group. Paldam (2003) surveyed Japan and the Four Asian Tigers—Hong Kong, Singapore, South Korea, and Taiwan—and used the Economic Freedom Index to understand the impact of the regulatory regime on the countries' rapid growth. Consequently, we propose the following hypothesis:

H4: The number of people employed in the apparel industry is posi-

tively correlated with economic growth in the short term, but negatively correlated in the long term.

However, maintaining these industries might initially increase economic growth. These costs may cause the fertility rate to decrease. This study argues that lower fertility rates will eventually lead to an economic downturn, displaying an inverted U-shape, initially rising and then falling.

Data and Methodology

Data Description

This study investigates whether changes in a country's demographic structure, without a corresponding adjustment in the industrial structure, will influence the country's economic growth. It also examines the effect on economic growth when a country's demographic structure alters but the domestic industrial structure does not adapt correspondingly.

The Panel Analysis Equation

Model 1: $PGDP_{i,j}$ = C+α D_Dd__________ÃÒϩϩ________________ D_Dd__________ÃÒϩϩ________________ D_

Model 2: $PGDP_{i,j}$ = C+α D_Dd__________ÃÒϩϩ________________ D_Dd__________ÃÒϩϩ________________204204204204204204204204 204204204204204204204204204204204204

Model 3: $PGDP_{i,j}$ = C+α D_Dd__________ÃÒϩϩ________________204204204204204204204204 204204204204204204204204204204204204204204204204204204204204204204 204204204204204204204204204204204204204204

Model 4: $PGDP_{i,j}$ = C+α 204204204204204204204204204204204204204204204204204204204204204 204204204204204204204204204204204204204204204204204204204204204204 204204204204204204204204204204204204204204204204204204204204204204 204204204204204204204204204204204204204204204204204204204204204204 204204204204204204204204204204204204204204204204204

Table 1. Explanation Of The Meaning Of Each Explanatory Variable

Variables	Variable description
PGDPi,j	logarithm GDP per capita growth rate
Ln GDPP i,j	logarithm of GDP per capita
FDI/GDPi, j	the foreign investment per GDP
Export/GDP i, j	export per GDP
Import/GDP i, j	import per GDP

DEPi, j	dependency ratio (percentage of working-age population)
DEP2i, j	Squared of Dependency ratio
EMPi, j	Employees (apparel industry)
EMP2i, j	Squared of Employees (apparel industry)

Text. Explanation of the meaning of each explanatory variable.

To validate the aforementioned hypotheses and factors affecting the economic growth of the Four Asian Tigers, we adopt the model by An and Jeon (2006). This research uses four models to validate our hypotheses. The economic growth is quantified by the log of the GDP per capita growth rate. Models 1 and 2 apply panel data to establish the validity of hypotheses 1, 2, and 3 concerning FDI, import and export trade, dependency ratios, and economic growth. Models 3 and 4 rely on FDI, import and export trade, and employment in the apparel industry to authenticate the validity of hypotheses 2, 3, and 4.

Our study sample includes Japan, China, Hong Kong, Taiwan, Brunei Darussalam, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Korea, Singapore, Vietnam, and Thailand. The sample period spans from 1977 to 2020. To comprehend the impact of population ageing and industries on East Asian countries, we utilize the following four models for validation, which are explained as follows.

Estimation and Empirical Results Analysis

This study uses Asian countries as a sample to test our hypotheses. We employ three measurement methods to identify the most suitable model and find that adopting a fixed effect model is the most appropriate. The dependency ratio and per capita economic growth exhibit an inverse relationship, in alignment with Hypothesis 1. The contents of the tables are explained as follows: Table 1 defines the meaning of each explanatory variable in Models 1 to 4. Tables 2 and 3 present the panel data model results for Models 1 to 4.

According to Model 1 in Table 2 and Model 3 in Table 3, FDI has a positive relationship with the economic growth of East Asian countries, supporting Hypothesis 2. Notably, exports do not show such a significant positive correlation with the economic growth of these countries. At the same time, an increase in imports has a notably negative correlation with the economic growth of East Asian countries. As a result, Hypothesis 3 is only partially valid.

Table 2. Panel data model results of Model 1 and Model 2

	Model1			Model2		
	POLS	FE	RE	POLS	FE	RE
C	22.7351*** (1.6998)	16.2492*** (3.3970)	18.3372*** (2.8295)	18.5815*** (2.9080)	1.9533 (4.9594)	8.9006*** (4.0479)
Ln GDPP	-1.4504*	-0.9874*	-1.1431*	-1.4174*	-0.5364*	-0.9863*

	** (0.1254)	** (0.2897)	** (1.6971)	** (0.1266)	(0.3036)	** (0.2238)
FDI/GDP	0.0086*** (0.0032)	0.0118*** (0.0033)	0.0110*** (0.0033)	0.0092*** (0.0032)	0.01221*** (0.0033)	0.0118*** (0.0032)
Export/GDP	5.4047*** (1.4943)	0.9017 (2.0267)	2.2250 (1.8644)	5.8003*** (1.5086)	3.2174* (2.0374)	4.1144*** (1.8676)
Import/GDP	-6.7914*** (1.4448)	-3.2156** (1.7932)	-4.0993*** (1.6971)	-6.9725*** (1.4459)	-5.1747*** (1.8175)	-5.5701*** (1.6929)
Dependency ratio	-0.1218*** (0.0148)	-0.0718*** (0.0234)	-0.0877*** (0.0209)	-0.0010* (0.0006)	0.2821*** (0.0937)	0.1867*** (0.0861)
Squared of Dependency ratio				0.0081 (0.0753)	-0.0027*** (0.0007)	-0.0021*** (0.0006)
Number of Obv.	613	613	613	613	613	613
Redundant Fixed Effects Tests		80.5707***			91.8148***	
Hausman Test			5.1175			11.2504
R-Squared	0.2112	0.3088	0.0664	0.2152	0.3244	0.0868

Text. Panel data model results of Model 1 and Model 2.

Model 3 in Table 3 indicates a significant positive correlation between the number of employees in the apparel industry and the economic growth of these countries. This trend reveals that, in the short term, the number of employees in the apparel industry is positively correlated with economic growth.

Interestingly, although the dependency ratio changes in the opposite direction to economic growth, an initial increase in the dependency ratio also causes economic growth to increase. Economic growth only decreases after a certain period. This phenomenon suggests an inverted U-shaped relationship between the dependency ratio and economic growth, which aligns with Hypothesis 1, and the result is consistent with An and Jeon's (2006) findings.

Table 3. Panel data model results of Model 3 and Model 4.

	Model 3			Model 4		
	POLS	FE	RE	POLS	FE	RE
C	8.0490*** (0.9519)	10.6233*** (1.7535)	9.8683*** (1.5081)	7.8017*** (0.9809)	10.1493*** (1.7774)	9.4448*** (1.5616)
Ln	-0.4794*	-0.7053*	-0.6710*	-0.4672*	-0.6775*	-0.6453*

GDPP	** (0.1236)	** (0.2289)	** (0.1936)	** (0.1241)	** (0.2292)	** (0.1967)
FDI/ GDP	0.0106*** (0.0037)	0.0139*** (0.0038)	0.0129*** (0.0037)	0.0107*** (0.0037)	0.0140*** (0.0038)	0.01306*** (0.0037)
Export/ GDP	1.8116 (1.8581)	-0.9220 (2.2651)	-0.1729 (2.1673)	1.8967 (1.8597)	-0.9025 (2.2616)	-0.2117 (2.1722)
Import/ GDP	-3.2842** (1.7276)	-2.0837 (1.9786)	-2.1393 (1.9203)	-3.3110** (1.7277)	-2.0939 (1.9755)	-2.1189 (1.9226)
EE (apparel)	1.09E-06*** (1.73E-07)	9.46E-07*** (2.96E-07)	9.35E-07*** (2.63E-07)	1.73E-06*** (6.37E-07)	2.11E-06*** (8.07E-07)	2.03E-06*** (7.58E-07)
Squared of EE (apparel)				1.44E-13 (1.38E-13)	-2.36E-13* (1.53E-13)	-2.29E-13* (1.48E-13)
Number of Obv.	464	464	464	464	464	464
RFET		91.9144***			93.3056***	
HST			2.3835			2.2360
R^2	0.1649	0.3150	0.0689	0.1669	0.3187	0.0726

Text. Panel data model results of Model 3 and Model 4. EE= Employee , FET =Redundant Fixed Effects Tests, HST=Hausman specification test

The "Squared of Employees (apparel)" variable in Model 4 shows a significant negative correlation with the economic growth of these countries. It indicates that in the long term, the number of employees in the apparel industry is negatively correlated with economic growth, supporting Hypothesis 4.

Discussion and Conclusions

Interestingly, these four countries - Hong Kong, Singapore, South Korea, and Taiwan - have recently seen the number of older individuals surpass that of young children: Hong Kong in 2011, Singapore in 2016, South Korea in 2017, and Taiwan in 2018. In the future, these countries will likely follow Japan's trajectory and become the "Four Old Tigers of Asia," with aging populations. Similar to Japan in earlier years, industries requiring low-cost labor and land for development have begun migrating to countries that offer these resources, such as China, Thailand, Malaysia, Indonesia, and other ASEAN countries.

Following closely behind the Four Asian Tigers, these emerging Asian economies are now encountering declining fertility rates. While these countries have yet to face aging issues, their fertility rates are gradually decreasing. It is conceivable that within one to two decades, these countries will also grapple with an aging population.

Despite governments recognizing the inevitability of industrial transformation, attempts to retain these industries are akin to sipping from a poisoned chalice, with future generations bearing the brunt. Driven by present political interests, these governments adopt various strategies to hold onto industries that could harm the country in the long term, hindering future economic development. Governments should prioritize the interests of future generations over short-term political gains, letting go of industries that should have already departed.

This study offers a blueprint for the development and implementation of social change, demographics, and industry strategies for the Asian government's post-economic development. We examine the short-term and long-term impacts of government policies on society. This research discovered a negative correlation between the dependency ratio and economic growth, an association that initially increases before decreasing. The case study of the apparel industry reveals that when a country shifts industries to other countries following technological advancements, the domestic economic structure is also impacted.

Protecting the rights and interests of workers affected by these relocated industries, and safeguarding political interests, leads to various policy measures to prevent these industries from moving out. This study uses the labor-intensive apparel industry as an example to show that retaining these industries in the short term when more people are employed, results in a positive correlation with economic growth. However, long-term engagement in these industries inversely impacts economic growth, as government incentives to retain these industries, unsuited to the country's economic structure, will harm the economy.

However, there are limitations to these proposals. Firstly, the study's scope is confined to the economic development and industrial shifts in Asian countries and the impact of government policies intended to protect labor on the nation's economy and society. Secondly, the empirical focus is primarily on the apparel industry, a labor-intensive sector. The central concern is the effects of the government's forced retention of ill-suited industries on society and the economy following industrial structure changes in East Asian countries. Given the samples are only from Asian countries, future research will include more countries, expand the study's scope, and conduct empirical research in other industries.

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