



Crises and Chances: Year 2015, the first year of the “Taiwan Aging Power Era”

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(Received 25 July 2011; Published on line 1 September 2011)

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DOI: [10.5875/ausmt.v1i1.97](https://doi.org/10.5875/ausmt.v1i1.97)

The birthrate in Taiwan is decreasing yearly. As a result the aging population problem is getting drastically worse. According to “Population Projections for R.O.C (Taiwan): 2010–2060”, the population growth rate will become negative after the total population peaks at 23.44 million in 2022. Does this mean that Taiwan will still be able to enjoy the benefits of population growth for the next 11 years, including a sufficient labor force to support Taiwanese industries during that period of time? Unfortunately, the answer may be “no”. The problem is that over the next 11 years the population of Taiwan will change not only in terms of “amount”, but also in terms of “quality”. Almost every country in Asia will encounter this common issue soon.

According to “Taiwanese Future Population Projection (the medium-variant)” released by the Council for Economic Planning and Development (CEPD) in September, 2010, the dependency ratio in the population will reach its lowest point (34%) (turning point) in 2015. The dependency ratio is the number of people aged 1–14 and those aged 65 and over, divided by the number of people aged 15–64. After the turning point in 2015, the more people who are dependent, the larger the dependent ratio will become and the heavier the burden of support for the labor forces in Taiwan will be.

The labor force in Taiwan’s primary, secondary and tertiary industries will all be directly impacted by the country’s low birthrate and rapidly aging population. If one looks at the labor statistics in these three industry sectors prior to 2015, and then one takes the projected dependency ratio and uses it to project the labor force available to the three industry sectors from 2015 to 2035,

one can see that there is a significant impact.

This impact will be explored in detail in this paper, as well as the idea that this change in the dependency ratio may also prove to be an opportunity for the automatic technology industry in Taiwan. The opportunities for businesses to capitalize on this demographic shift will occur not only in Taiwan, but throughout Asia.

The Deteriorating and Aging Workforce in the Primary Industry

The employed people in the Primary Industry are projected to decrease continuously, and the aging of the workforce is obvious as well (Figure 1). It is predicted that the labor force in 2035 will be 238 thousand less than it was in 1995, and the age group of employed people will level up from 55–59 years old to 60–64 years old, and even extend above 65 years old.

This means that if the employment trend remains the same, the primary sector of domestic farming, mining, logging, fishing and the poultry industry in the future will be managed by a smaller labor force which will be more obsolete than it is right now and will be responsible for domestic food provision in 2035. From the aspect of automated technology, a novel production system and age-friendly and user-friendly production machine equipment will be needed for the primary sector of industry in the next decades. We expect these novel production systems and machines will be able to be managed well by the middle aged and elders to extend the processes of the primary sector of industry easily and effectively.



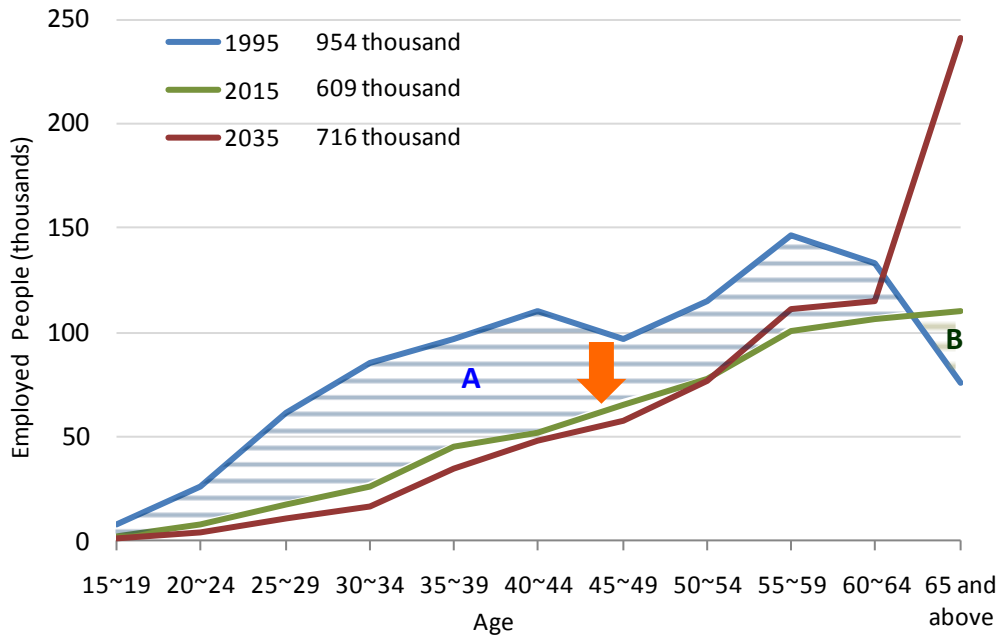


Figure 1. The Change of the Age Group Served in the Primary Sector of Industry. [1-3]
 (The ratio of employed people in various sectors of industry and the age groups in 2015 and 2035 are based on the structure of 2010. The data of the secondary and tertiary sector of industry are as well.)

The Downward Curve of Labor Forces in the Secondary and the Tertiary Sector of Industries

Comparing the employment trend figures of the secondary sector of Industry between 1995 and 2015 (Figure 2) shows that the area of measurement composed by the curve of 2015 is larger than that of the curve of 1995 (Area A is reduced while Area B is added). Employed people have increased from 3.50 million to 3.75 million (an increase of about 0.25 million people in 20 years). However, as the population growth almost reaches its peak, it will reverse down in 2022. Overall, the supply of labor forces for the secondary sector of industry will begin to decrease dramatically to about 3.05 million people in 2035 (decreasing about 0.7 million

people in 20 years). A similar situation also happens in the tertiary sector of industry. In that sector employed people increase gradually from 4.59 million in 1995 and then decrease gradually. It is predicted that there will be about 5.18 million people working in the tertiary sector of industry in 2035.

Obviously, the downward curves represent changes in the labor forces of the secondary and the tertiary sector. Given the substantial declines in Taiwan's population which are projected in the not-so-distant future, it is imperative that thorough plans be made in advance if the country is to survive. These plans must include adjustments in the industrial structure, the development of thoughtful and appropriate labor policies, increases in labor productivity, and the introduction of automatic intelligent systems and equipment which can enhance productivity.

Aging Core of the Industry

If we take age group structure a step further, the number of young workers in the years between 2015 to 2035 will decline sharply due to the impact of the low birthrate and increases in the amount of time spent in school. As we can see in the figure, 30 year olds are found at the climax of the population distribution in the secondary sector of industry from 1995 to 2015, while the age group of 30–40 takes the lead from 1995 to 2015. The core labor forces in the tertiary sector of industry change from the age group of 23–29 in 1995 to 35–39 in

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2015. As a result the core labor force in the secondary and the tertiary sectors of industry will not consist of young workers but an older age group.

This change in the structure of the labor force where the number of young workers declines and the number of older workers increases will have a strong impact on manpower structure in industry. Many

workers in senior positions may not be able to find replacements that can learn from their experiences or inherit their skills. Furthermore, essential tasks currently carried out by young workers will have to be distributed among fewer workers in that age category. This will be a particularly difficult challenge for high labor density industries.

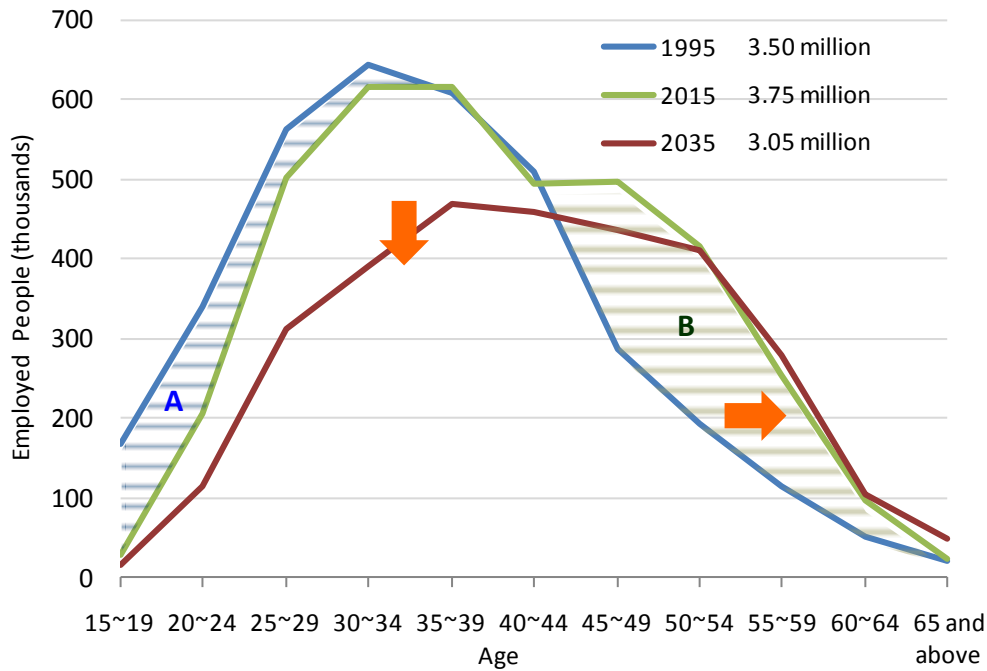


Figure 2. The Change of the Age Group Served in the Secondary Sector of Industry [1-3].

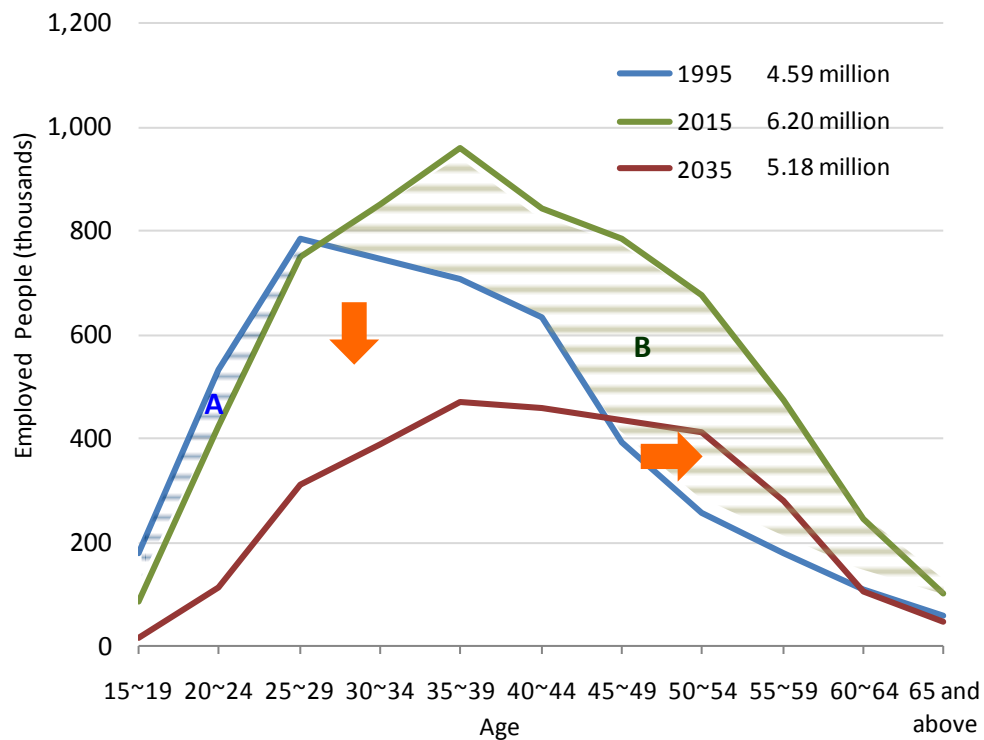


Figure 3. The Change of the Age Group Served in the tertiary sector of industry [1-3].

The Ambiguous Boundary of Core Labor Forces

As we move towards 2035 it will become increasingly difficult to distinguish particular age groups as being the core of the labor force in the secondary and tertiary sector industries. As young people spend more time at school they will step into society later while the older labor force will find it necessary to delay retirement because of the need to build up their life savings and annuities to support their life after retirement. This means that the curve representing the average age of workers will not decline until after the ages of 55–59 and 60–65.

The demographic changes in the ages of the working population which are occurring in Taiwan will result in a situation where particular age groups will no longer be segregated in particular industrial sectors. Instead workers of all ages will be distributed throughout industry. This will make it necessary for employers in the secondary and the tertiary sectors of industry to review job design, working environments, equipment, and flexible working hours. They will have to redefine job descriptions and working styles to maintain the effectiveness of the workforce.

Conclusion

In the 1930's scholars created a basic model, the flying-geese model, to analyze the economics of industrial and business development in Japan and other South-East Asian countries. They used the model to explain the development of relationships in industries among Japan and other countries in Asia. The lead goose was Japan and Taiwan followed behind. Then other South-East Asian countries with less developed skills followed after Taiwan. This same flying-geese model can be seen in changes in the structure of the populations of the nations in South-East Asia. (Table 1)

Faced with the dual pressures of a drastically decreasing labor force and the aging of the core labor force, how should Industries in Taiwan transform themselves? Does the subsidy planned by the government for retired people meet the needs of an increasingly aging population? If not, will workers stay on longer in the workforce? These issues will have a significant impact on the development of Taiwan's industry.

Taiwan needs to respond to the issues outlined in this paper as soon as possible to avoid the impact which the low birthrate and a rapidly aging population will have

Table 1. The Flying-Geese Model of Population Structure in Asia with 4 Phases [4].

Time(year)	Phase 1 Low birthrate	Phase 2 Step into an aging society	Phase 3 Gradual Decrease of the labor force	Phase 4 Gradual Decrease of the total population
	The total birthrate is less than 2.1	Elders are more than 14% of the total population	The labor force begins to decrease	The total population begins to decrease
1960–1965	Japan			
1965–1970				
1970–1975				
1975–1980	Singapore			
1980–1985	Hong Kong、Taiwan			
1985–1990	Korea			
1990–1995	China	Japan		
1995–2000	Thailand			
2000–2005			Japan	
2005–2010	Vietnam			Japan
2010–2015		Hong Kong	Taiwan	
2015–2020	Indonesia	Korea、Singapore Taiwan	China、Hong Kong	Korea、Taiwan
2020–2025	Malaysia		Korea、Singapore	
2025–2030		China、Thailand		China
2030–2035	India			
2035–2040	Philippine	Vietnam	Thailand、Vietnam	Singapore
2040–2045		Malaysia、Indonesia		Thailand、Vietnam



on industry and the economy. Steps must be taken to fill the gap which will occur as the proportion of young workers in the labor force declines. In addition, facilities and working environments must be adapted to accommodate an aging workforce. Automatic intelligence systems and techniques must be developed to compensate for the overall decline in the workforce.

The speed with which the population in other South-East Asian countries age will be slower than in Taiwan. In this respect, Taiwan is a lead goose in the flying-geese model. By leading the way in research and in the development of automatic techniques and products which can maintain the usefulness and efficiency of older workers, both in the industrial workplace and at home, Taiwan can take advantage of the demographic changes which it faces. Taiwan can place itself in the forefront economically, by using its know-how and experience to create new and novel business opportunities that respond to the great demographic change which is sweeping across Asia.

Acknowledgement

This work was supported by Ministry of Economic Affairs, Taiwan, under the projects entitled "Research of 2015 Taiwan Industry Development and Technology Integration" and "Research of Taiwan Industry and Technology Foresight".

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