CHAPTER 4

TAIWAN'S MACROECONOMIC FRAMEWORK

The "Taiwan Miracle" is often analyzed from the perspective of government policies and outcomes (Clark, 1987; Little, 1979).[1] During the 1960s and 1970s, an increase in the factors of production, elevated the GDP about 10% annually. A stable currency helped improve savings rates that reached almost 30% by 1970. In terms of human capital, elementary education was widespread and the number of students in secondary education also increased. Some analysts credit the Taiwanese Miracle to factor growth but others think that productivity was also a major factor for the success of Taiwan (Gold, 1986; Olds, 2003).

For the past five decades, Taiwan has achieved one of the highest and most sustained growth rates worldwide in gross national product (GNP) and international trade (Clark, 1989). Postwar economic development in Taiwan can be considered as a successful model amongst the developing world. Likewise, Taiwan has been successful in controlling inflation and prices, keeping unemployment rates extremely low and distributing national income fairly well. Taiwan, South Korea, Hong Kong, and Singapore, are recognized as the newly industrialized countries and the "Four Little Dragons" in East Asia.[2]

Taiwan is unique in many ways. The Government Information describes its development and economic miracle as an example for many other countries. Its macroeconomic indicators are outstanding. As the 2004 government statistics show (CEPD, 2005) its gross national product (GNP) reached US$316,704 million, and its

[1] The *Taiwan Miracle* refers to the rapid growth of the Taiwanese economy in the latter half of the twentieth century.

[2] Also known as the East Asian Tigers, they were noted for maintaining high growth rates and rapid industrialization between the early 1960s and 1990s.

per capita GNP was US$14,032. Gross domestic product (GDP) in 2004 grew to US$305,358 million, with the industrial sector contributing 30% and agriculture only 1.70 percent. The service sector, which has been strong and credited for more than 50% of Taiwan's GDP since 1988, accounted for 68.7 % of the GDP in 2004.

The macroeconomic framework of Taiwan is certainly a strong and unique example of the product of solid planning and effort by the policy makers and the people of Taiwan.

4.1 Economic Indicators

In 2005, the Council for Economic Planning and Development (CEPD) published a document about the economic development of Taiwan. The following synthesis of the macroeconomic indicators has been extracted from the information prepared by the CEPD (2005).

In macroeconomic terms, Taiwan has been experiencing continuous growth in 2004 (Table 4-1). Following are some macroeconomic indicators for 2004 (CEPD, 2005):

- Economic growth rate increased to 5.71%;
- Employment has continued to improve as a result of growing world economy and government measures. In 2004, employment increased 2.23%, lowering the unemployment rate to 4.4%;
- Consumer Price Index (CPI) increased by 1.6%.[3] The price increase was caused by their low base the previous year and by the increase in the price of oil and raw materials, plus shortages in vegetable products caused by weather; and
- As part of the promotion of innovation in the industrial sector, industrial restructuring and upgrading have continued to increase. The service sector nominal GDP reached a high of 68.7%, making services the center of economic expansion and a crucial stabilizer for economic growth. Manufacturing was an important factor for economic expansion, adding 2.5% points to the economic growth.

[3] CPI is a price index which tracks the prices of a specified set of consumer goods and services, providing a measure of inflation.

Economic Growth

Among the most notable macroeconomic indicators of Taiwan's success are fast economic growth, stable prices, low unemployment, and equitable distribution of income. This record of growth with stability and equity has been matched by only a handful of other countries worldwide. For example (CEPD, 2005):

- Average annual economic growth rate was 9.12% for the period 1960-1980;
- Unemployment remained under 2.0% after the mid-1960s;
- Consumer prices increased an average annual rate of 4.3% in the 1970s but slowed to 3.0% in the 1980s;
- Economy expanded 6.3% per year in the 1990s as Taiwan's economy matured. Consumer prices increased an average annual rate of 2.9%, and the unemployment rate averaged 2.0%;
- During the 2000-2004 period, economy expanded 3.3%, consumer prices increased an average annual rate of 0.5%, and the unemployment rate averaged 4.4% (Table 4-1); and
- In 2004, per capita GNP was US$14,032 (Table 4-1).

International Trade

Taiwan's trade with the Asia-Pacific countries has been on the rise as a result of regional integration efforts and world economic trends. Mainland China and Hong Kong are Taiwan's largest export markets. In 2004, exports to these destinations were 19.5% and 17.1% respectively. The United States is the third major export market for Taiwan. As part of a policy to diversify Taiwan's trade markets, trade between Taiwan and ASEAN has grown.[4] Exports to ASEAN countries accounted for 5.5% of exports in 1987 but increased to 13.3% by 1997 (CEPD, 2005).

[4] The Association of Southeast Asian Nations (ASEAN) is a political, economic, and cultural organization of countries located in Southeast Asia.

Table 4-1 Macroeconomic Indicators in Taiwan

ITEM	UNIT	2002	2003	2004
Economic growth rate (GDP increase)	%	3.94	3.33	5.71
Gross national product (GNP)	US$ billion	288.5	295.6	316.7
Per capita GNP	US$	12,884.00	13,139.00	14,032.00
Changes in consumer price index (CPI)	%	- 0.20	-0.28	1.620
Exchange rate (end of the year)	NT$ per US$	34.753	33.978	31.917
Prime/base lending rate (end of the year)	%	7.310	3.330	3.450
Unemployment rate	%	5.17	4.99	4.44
Foreign exchange reserves (end of the year)	US$ billion	161.7	206.6	241.7
Merchandise exports (at FOB prices)	US$ billion	130.6	144.2	174.0
Merchandise imports (at CIF prices)	US$ billion	112.5	127.3	167.9
Balance of trade in merchandise	US$ billion	18.1	16.9	6.1
Balance of trade in goods and services	US$ billion	21.1	22.4	11.6
Balance of trade in goods and services as percentage of GDP	%	7.5	7.8	3.8

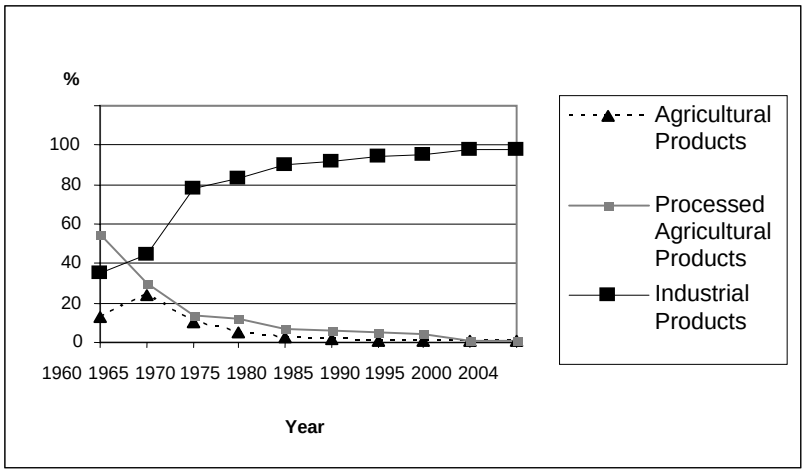
Source: CEPD (2005).

Traditionally, Japan and the United States were the major suppliers of Taiwan's imports providing more than half of total imports up to 1995 but this trend is decreasing and by 2004, they accounted for only 38%. Imports from ASEAN countries has in turn increased, from 9.9% in 1994 to 12.1%, and imports from mainland China have risen from 2.2% to 9.9% (CEPD, 2005).

Taiwan's merchandise trade reflects the restructuring an improvement of its industry and the progress in the liberalization and globalization of its economy. Industrial products accounted for more than 90% of total exports in 1990 and reached 98.6% by 2004 (Fig. 4-1). Exports of capital and technology-intensive goods are especially important and have gone from 32% in 1981 to 77% in 2004. Exports of electronics and information technology products have increased from 13.7% in 1981 to 30.6% in 2004 (CEPD, 2005).

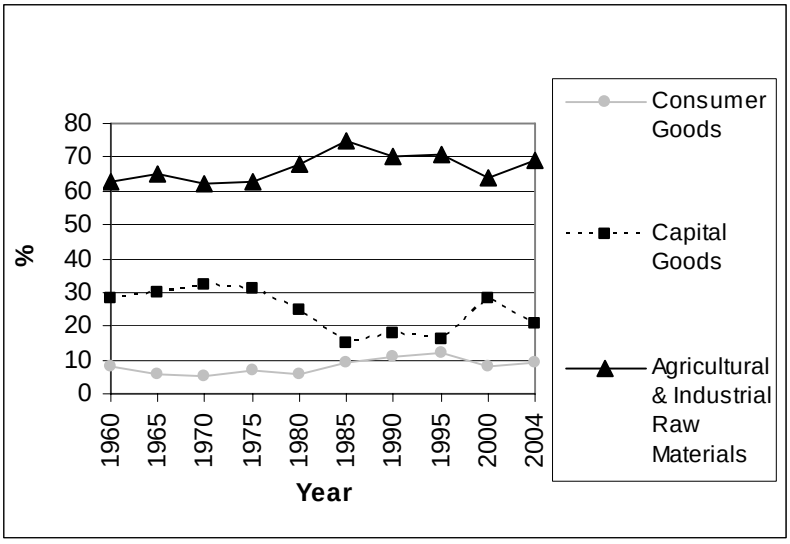
Because of its geographical limitations, Taiwan imports more than 60% of its agricultural and raw materials (Fig. 4-2). Economic liberalization and rising income brought the proportion of consumer goods in total imports to 13.6% in 1997, but it came down to 8.2% by 2004 (CEPD, 2005).

The key to Taiwan's rapid economic expansion was the change to an outward looking strategy and the promotion of foreign trade early in the country's development (Clark, 2000). This success would not have been possible if Taiwan had centered its efforts to its limited domestic market. Foreign trade rose quickly in the 1960s and 1970s. In 1971, Taiwan recorded its first trade surplus. Exports exceeded imports by US $18.7 billion in 1987 (CEPD, 2005).



Source: CEPD (2005).

Figure 4-1 Composition of Exports in Taiwan



Source: CEPD (2005).

Figure 4-2 Composition of Imports in Taiwan

This external imbalance was corrected when the government increased public spending and allowed the market to determine the currency appreciation. Other measures were economic liberalization and reforms to the legal and administrative structure, and the development of infrastructure. With the current trend of imports expanding faster than exports, the annual trade surplus for 2004 was to US$6.1 billion, down from US$16.9 billion in 2003 (CEPD, 2005).

Saving and Investment

The increase in trade surplus in the 1980s and the explosive growth in liquidity caused an economic-bubble toward the end of the decade. By 1986, excess savings reached 21.4% of GNP (CEPD, 2005). Stock and real estate prices went up, production costs increased, and the investment climate was negatively affected. The government responded by increasing the pace of economic liberalization, increasing public investment, and promoting industrial restructuring. As a result, the trade imbalance was reduced and economic stability was restored.

As a result of higher incomes and the opening of domestic markets, consumers have become more active spenders and household savings relative to income has fallen.

Higher costs for land, labor, and environmental protection have lowered internal savings by businesses as well. Slower growth in current revenue and greater spending on social welfare has lowered the account surplus in the government's budget. As a result, national savings fell to 26.2% of GNP in 2004 from 38.5% in 1987 (CEPD, 2005).

Foreign Direct Investment

Taiwan's economic development has been influenced by Foreign Direct Investment (FDI).[5] The transfer of technology and broadening of markets involved in FDI have in turn contributed to the industrialization of Taiwan. Since the liberalization and globalization movement that began in the 1990s, Taiwan's FDI in Asia-Pacific has increased so dramatically that now it is the second-largest inter-regional investor after Japan (CEPD, 2005). Taiwan's manufacturing industry has evolved from Original Equipment Manufacturing (OEM),[6] to Original Design Manufacturing (ODM),[7] and on to Configure to Order (CTO) manufacturing.[8] Consequently, Taiwan is a major stakeholder in worldwide logistics.

Production Structure

As part of the industrialization process, a large proportion of resources went from agriculture to industry. During this time, industrial production increased its share of gross domestic product (GDP) (Fig. 4-3). Industry's share of real GDP rose from 21.3% in 1961 to a peak of 41.9% in 1986, after which it began to gradually decline. Since the mid 1980s, due to the rise in consumer spending brought about by the accumulation of personal income, domestic demand has been growing. The increased demand for

[5] Foreign direct investment (FDI) is the movement of capital across national frontiers in a manner that grants the investor *control* over the acquired asset.
[6] An OEM is a company that builds products or components which are used in products sold by another company.
[7] An ODM is a company which manufactures a product which ultimately will be branded by another firm for sale.
[8] CTO represents the ability for a user to define the component configuration of a product at the moment of ordering that product, and a vendor to subsequently build that configuration upon receipt of the order.

services has boosted the service sector and by 1985 it generated more than 50% of Taiwan's GDP.

Industrial production made up 32.9% of GDP in 2004 while agriculture was only 1.7% (CEPD, 2005).

In the 1980' the government responded to a decrease in the competitive advantage of its industries by creating the Hsinchu Industrial Park to promote new technologies.[9] Currently, Taiwan is the world's fourth largest producer of information technology hardware and the largest provider of integrated circuitry services (CEPD, 2005).

Monetary and Financial Development

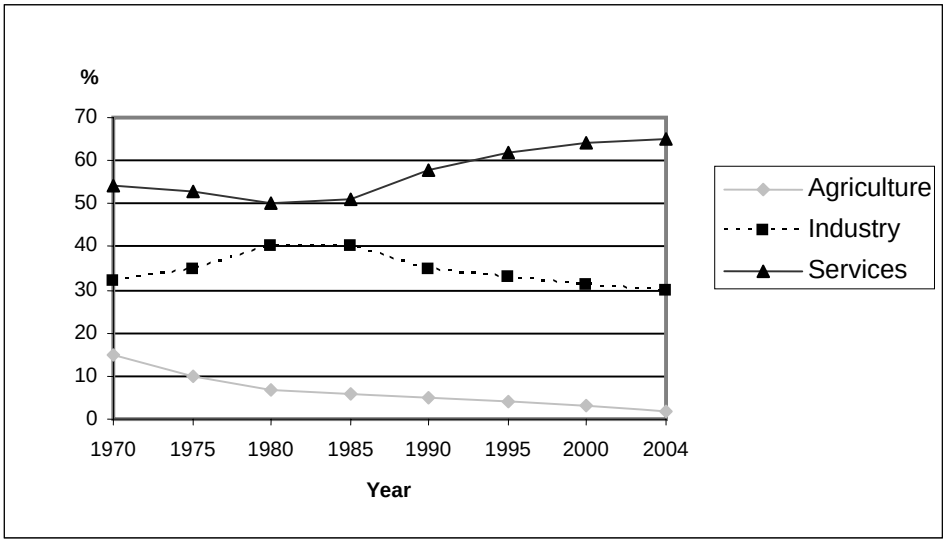
Since the 1970s, the government has renovated its financial regulations and removed some financial controls thereby generating opportunities for financial innovation and new financial products. These measures have been taken to increase financial liberalization, improve Taiwan's competitive standing in world financial markets, and promote the adoption of international financial practices.

Financial reforms included in the Challenge 2008 Six-Year National Development Plan,[10] have the goal of reducing the banking sectors non-performing loan (NPL) ratio and raising the banks' capital adequacy ratio.[11] By 2004, the NPL ratio had been lowered from 8.04% in 2002 to 2.78%, its lowest level since 1995 (CEPD, 2005).

[9] Hsinchu Science Based Industrial Park is now one of the world's most significant areas for semiconductor manufacturing.

[10] The government of the ROC has formulated the "Challenge 2008" comprehensive six-year national development plan as the latest effort to foster the creativity and talent Taiwan needs to transform itself into a "green silicon island."

[11] A non-performing loan is a loan that is in default or close to being in default.



Source: CEPD (2005).

Figure 4-3 Gross Domestic Product by Sector in Taiwan

Public Finance

Taiwan has traditionally had a substantial surplus to cover capital-account expenditures.[12] In 1991, the government invested in large infrastructure projects and expanded the social welfare programs. As a result of public expenditures surpassing growth in revenue, the government opted for public debt to finance the growing budgetary deficits. To reduce the imbalance between revenues and expenditures, the government implemented fiscal reforms in 1999 to set the basis for a more rational system of taxation and expenditures.

[12] Funds spent for the acquisition of a long-term asset.

4.2 Social Indicators

Labor Force and Employment

The working age population of Taiwan increased from 66.7% in 1990 to 71.2% in 2004 in association with high birth rates before the 1980s. Even so, the labor force participation rate has fallen over time, decreasing to 57.7% in 2004 from a high of 60.9% in 1987 (CEPD, 2005). The reason for this is probably because young people are extending their educational training.

Employment had been increasing 0.9% per year during the last decade but as a result of a slack in the economy and labor market rigidity, the rate of unemployment has been increasing since 1995. The changes in Taiwan's economic structure and world economy have brought about greater levels of structural unemployment. Unemployment rates went from 2.6% in 1996 to 5.17% in 2002. This trend slowed to 4.44% in 2004, in part due to economic prosperity and the implementation of a Program to Expand Employment in Public Service in 2003 (CEPD, 2005).

As the country evolved from an agricultural into an industrial economy, the employment structure changed dramatically (Fig 4-4). Agricultural employment went from 36.7% in 1970 to 6.6% in 2004, at the same time industrial employment went from 28.0% in 1987 to 35.2% in 2004. Employment in the service sector has increased from 35.3% to 58.2%, and will probably be the major source of employment for the time being (CEPD, 2005).

Education

Education has been a priority for the Taiwan government and the annual budget has included substantial educational expenditures. In 1968, a nine-year compulsory education system was introduced and public education programs have included high standards and widespread access (GIO, 2005). As a result, there has been a continuous rise in the literacy rate and education level of the Taiwanese people.

In 1976, 33.9% of the Taiwanese older than 15 had completed high school or vocational school, but by 2004 the rate had risen to 49%. For this same age group, those that obtained a university degree went from 7.4% in 1976 to 30.5% in 2004 (Fig 4-5). As a result of the educational policies, Taiwan has now more people with higher education than people with only a primary-level education.

Taiwan has a rich human capital, with highly skilled and educated people with capacity for research and development. The government intends to continue investing in its human resources through the improvement of its own technical and research workforce and promoting the recruitment of highly skilled scientists from around the world. English language learning will be promoted among its population as well. The advantages of the internet will also be tapped to promote on-going education through the educational system, and train more people in computer and internet skills (CEPD, 2005).

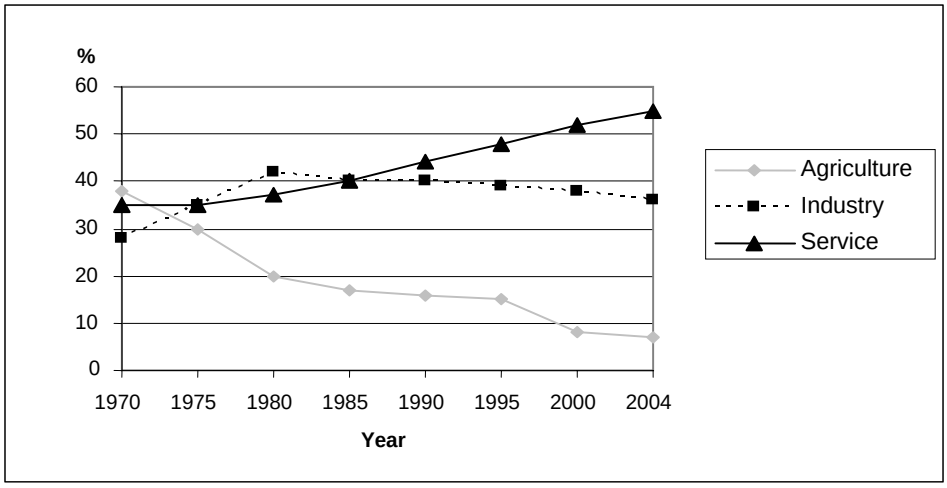
Science and Technology

Up to the mid 1980s, Taiwan technology and scientific development experienced a labor intensive phase. The country worked hard to make its light industry competitive in the international market by making labor and capital more efficient and introducing production, managerial, and marketing know-how from abroad. Recently the government has placed emphasis on applied technological development and the encouragement of technology intensive industries (Fig 4-6). The combined effort of government, private sector, and research institutions has resulted in the following accomplishments (CEPD, 2005):

- Spending on Research and Development increased from 1.03% of GDP in 1985 to 2.45% in 2003, and the goal is to reach 3% by 2006. The number of research personnel per 10,000 population rose from 12.8 in 1985 to 42.7 in 2003. Taiwan's world ranking in the Science Citation Index (SCI),[13] rose from 36th to 18th and from 26th to 10th in the Engineering Index (EI);[14] and

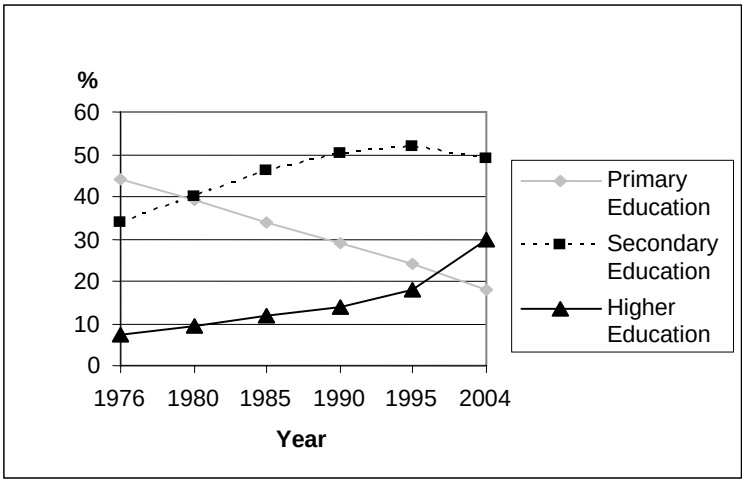
[13] SCI a worldwide scientific database.
[14] EI is an engineering worldwide database.

- From 1985 to 2004, high tech intensive products increased their share of total exports from 18.8% to 54.0%.



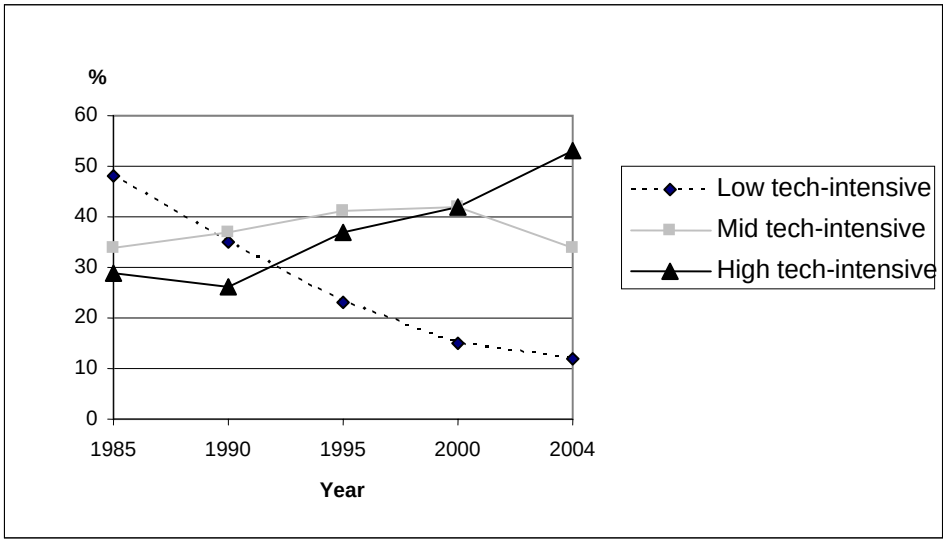
Source**:** CEPD (2005).

Figure 4-4 Employment Structure in Taiwan



Source: CEPD (2005).

Figure 4-5 Population Distribution by Level of Education in Taiwan



Source: CEPD (2005).

Figure 4-6 Composition of Export Products in Taiwan

Social Security

The government has taken measures to ensure that its people have the basic needs in view of social, economic, and political transformations. Measures taken include social security legislation and improved existing services. Public spending has increased from 10.0% in 1970 to 27.6% in 2003 (CEPD, 2005). In 1995, the government introduced national health insurance benefiting practically all its population as well as unemployment insurance coverage introduced in 1999.

In 2003, to offset the effects of structural unemployment caused by the industrial transition, the government introduced a program to expand employment in public service. This program has created thousands of jobs in the public sector reducing the unemployment by 0.23% in 2003 (CEPD, 2005). Other programs include a program for sustainable employment, a project for upgrading job skills, a plan for the development of care-services and welfare industry, and a national travel card system.

4.3 Summary

Overall, Taiwan has achieved an outstanding macroeconomic framework. Taiwan has successfully maintained excellent growth rates and social and economic indicators. Its low unemployment rates and fair distribution of income are two highlights of the Taiwanese economy. The economic and development framework of Taiwan is unique and probably difficult to imitate but nevertheless it poses a real sample of how a developing country can use its assets to overcome poverty and transform itself into an industrialized stable economy.