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Analysis of the aircraft manufacturer IPTN, an Indonesian state-owned company

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THESIS

ANALYSIS OF THE AIRCRAFT MANUFACTURER IPTN, AN INDONESIAN STATE-OWNED COMPANY

by

Abdul Madjid
December, 1995

Thesis Advisor: Robert E. Looney

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13. ABSTRACT *(maximum 200 words)*

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The objective of the thesis is to analyze trends in IPTN's investment. In particular, it analyzes the impact of IPTN's capital formation over the 1976 - 1992 period on Indonesia's GDP.

First, a brief description of IPTN's background and Indonesia's economic condition is presented. Second, an assessment is made as to why IPTN should have strategic planning to compete in the international market. Third, based on econometric analysis, IPTN's prospects for the future are examined.

As is typical with econometrics, the data is incomplete; however, a trend can be identified. The model used shows that the government's investment in IPTN does not appear to have a significant impact on Indonesia's economic growth, as measured by GDP.

Finally, recommendations for IPTN are made, including accepting foreign and private investors and utilizing a niche marketing strategy. A strategic planning program for international marketing is also outlined.

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ANALYSIS OF THE AIRCRAFT MANUFACTURER IPTN, AN INDONESIAN STATE-OWNED COMPANY

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Submitted in partial fulfillment
of the requirements for the degree of

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from the

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ABSTRACT

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First, a brief description of IPTN's background and Indonesia's economic condition is presented. Second, an assessment is made as to why IPTN should have strategic planning to compete in the international market. Third, based on econometric analysis, IPTN's prospects for the future are examined.

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I. INTRODUCTION

A. GENERAL

The aircraft industry is considered a long-term, high-risk, and multi billion-dollar investment. Therefore, this means that the aircraft manufacturer must risk more than a billion dollars over fifteen years before breaking even. According to U.S. Civil Aviation[1], only 5 of 22 manufacturers of large transports have survived since World War II. Their profitability is lower than other manufacturing, with many problems in production, financial, sales, and in management.

Industri Pesawat Terbang Nusantara (IPTN) is an Indonesian government-owned company. As a new entrant in the aircraft industry, its goal is to become an international competitor in commuter aircraft and to encourage human development, productivity and innovation of technology[2].

Behind glorific dreams, there is some concern for the social economics of Indonesia with a real GDP growth of 6.8 percent in 1994, and a current account deficit expected to be US$ 3.2 billion. Further, foreign-debt was expected to reach US$ 88 billion, governmental, and US$ 100 billion in the private sector[3]. With Indonesia's population of 200,409,741[4] and a GNP, per capita, in 1993 to be US$ 2980 (estimated), [5] Indonesia's ranking in the developing countries is still in the lowest group. Most of Indonesia's modern industries is highly dependent on imported raw materials, such as wheat, cotton, paper, soybeans, lactose, some iron and steel products, propylene granules, flour, and lube oil[6]. Generally speaking

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[1] U.S. Civil Aviation Manufacturing Industry Panel, *The Competitive Status of the U.S. Civil Aviation Manufacturing Industry* (Washington DC: National Academy Press, 1985), p. 22.

[2] IPTN, Bulletin No. SP/DK/VIII/92

[3] "Far Eastern Economic Review," *Asia 1995 Yearbook*, p. 138.

[4] July 1994 estimated, Internet http://www.ic.gov/94 fact/country/114.html

[5] Ibid.

[6] US Trade Representative, 1995 NTE on Foreign Trade Barriers, Indonesia, p 152

Indonesia's domestic industry is considered to be in a tenuous position relative to international market situations.

A strategy to develop IPTN as a high-technology industry, irrespective of the country's resource base and the economic costs, would be considered a significant threat for the country's development and future growth. As Keith Hartley stated: "non-economists often fail to understand and apply the cost conception since it was formulated by economist Friedrich von Wieser."[7] It is necessary to implement a wise policy in order to secure and maintain the new high-technology industrial investments without government supports such as subsidies, tariff protection, and preferential purchasing.

B.   SCOPE OF THE THESIS

With diminishing government supports to IPTN, there are some possible options for capital investment which may be selected. On the other hand, an equivalent amount of government subsidies to IPTN may be more useful if they were invested in other sectors.

In specific, this thesis will evaluate various problems dealing with IPTN as a state-owned company, in particular: To determine:

- In relation with macroeconomic policy, which is more important: To give a subsidy to IPTN, or to utilize critical budget measures to reduce national poverty?

- Would IPTN be able to competitive in the international market in light of its current status?

- If the Indonesian government changed IPTN's status, would this attract foreign investors?

- What is a viable solution for retaining IPTN's investment, if IPTN is near bankrupt?

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[7]   Keith A. Hartley, "A Market for Aircraft," *The Institute of Economic Affairs* (London, 1974), p. [4].

C.   PURPOSE OF THE THESIS

Controversy over IPTN has become polemic among presidential economic advisers, economic technocrats, and the engineering group. The rising standard of living together with sustained rapid growth, low inflation, reduction of poverty, and a strengthening of the infrastructure has become the priority strategy. On the other hand the group's strategy is considered to be pro-protectionist of Indonesia's national industries.

Based on management theories, a critical point is to decide whether efficiency or effectiveness is to be put in the forefront. This thesis evaluates various factors of the IPTN environment, which are the strengths, weaknesses, opportunities, and threats to IPTN. In analysis this thesis also suggests that the government has several options to reduce the budget by privatizing IPTN.

IPTN will become a source of the national pride, if it becomes a large, complex company without being a detriment to more than 200 million people's life.

D.   METHODOLOGY

Because of the scarcity of the IPTN's cash flow data, this research will evaluate the data provided from similar industries and international institutions using economic theory and management approach. There will be an emphasis on the forecasting in the macroeconomics and strategic management of IPTN. U.S. aircraft companies' data were used for comparison within the research. The rationale is that the U.S. aircraft industries' management and funding problems have similar characteristics to the IPTN problems.

In essence this thesis tries to compare two options. Forecasting the implications if the government spends money to subsidize IPTN or forecasting the implications if the government spends its budget on another sector.

E. ORGANIZATION

This thesis is organized into seven chapters. Chapter I is the "Introduction." It contains an introduction and an overview of the state-owned company IPTN, and the problems dealing with government's fiscal situation, scope of the thesis, purpose of the thesis, methodology used in research, and the organization of the thesis.

Chapter II is an overview of Indonesia, its geographic, population, and economics background related to its support of IPTN to achieving Indonesia's dream. The research emphasizes government foreign debts, either government or private, and the debt services. The latest data was obtained from international institutions, such as IMF (the International Monetary Fund), World Bank, and from other resources.

Chapter III discusses IPTN from it's beginning as a government aircraft industrial pioneer, later to become NURTANIO, and finally, its status as a state-company. It is difficult to obtain an accurate financial picture of IPTN, except in its production and from public references. This research uses authentic data from world leading major aircraft industries, with the assumption that they have similarities in management.

Chapter IV bottom-lines the IPTN' s environment based on the strategic management approach. Using strategic management theory, the IPTN's stakeholders can be identified although not in specific detail. Also, by using global data, the position of IPTN in the commuter aircraft markets can be made clear.

Chapter V contains several economics and statistics theories to calculate the prospect and fiscal conditions in relation with government debts, GDP, and other parameters.

Chapter VI discusses some options for IPTN to improve its capability as a modern aircraft manufacturer and as a global competitor, without government subsidies.

A summary and conclusion of the overall study is in Chapter VII. It also has recommendations for the government in making appropriate decisions on subsidies to IPTN. This chapter will consider changing the IPTN status to improve its ability in market competition.

II. BACKGROUND AND OVERVIEW

A. GENERAL

This chapter discusses various factors, such as the Gross Domestic Product (GDP), disposable income, level of investment, interest rate, inflation, currency valuation, tax rates, depreciation, and unemployment. Also discussed are general characteristics of aircraft industries. These factors may effect the IPTN development and improvement in the long-term, since monetary conditions have an impact on the size of the government subsidy to state-owned companies.

1. Gross Domestic Product

The most populous country of Southeast Asia, Indonesia, is an archipelago of over 13,500 islands between Asia and Australia. Estimated population is 200,409,741 million.[8] There is a poverty rate of 17 percent (1993). Thirty-two percent adult women are included within the official labor force. The majority of women work primarily in a combination of agriculture or cottage industries in the rural areas. Agriculture employs more than half of the labor force, and provides about one-third of the gross domestic product, per capita income of $ 676 in 1993.[9] Agribusiness and manufacturing have an important role in export, besides oil and other natural resources.

For many years, Indonesia viewed a stable, noninflationary monetary policy as an imperative to long term growth. Indonesia maintains a balanced budget. Its budget is financed largely through a progressive tax, and is supplemented by foreign aid through the Consultative Group on Indonesia (CGI). Tax collection will allow the country to internally finance 65.85 percent of its development expenditures.[10] The government monitors its

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[8] Ibid.

[9] National Development Information Office, *Indonesia Managing Growth with Prudence* (Jakarta, 1994), p. 16.

[10] Ibid.

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external debts position to maintain a strong credit rating and to give it a stronger current account position.

By the end of the First Long-Term Plan in 1993, growth in overall GDP annually was 6.8 percent. The largest contribution to GDP came from the industrial sector, increasing from 9.2 percent in 1969 to 22.4 percent in 1993, while the agriculture sector contribution declined from 49.3 percent to 18.36 percent over the same period. A lesson learned from the oil boom effects in 1973 and despite diminishing oil resources, Indonesia has deemphasized oil's contribution to GDP from around 24 percent to 8.87 percent. This figure also includes mining and quarrying. The other significant contribution comes from trade, hotel, and restaurants. They contributed 16.65 percent to GDP. Generally, the composition of GDP in 1993 is shown in Figure 1. Composition of Expenditure in GDP Growth (Percent) is shown in Table 1.

The government consumption increased from 8.98 percent of GDP in 1988 to 10.03 percent in 1993, hence the government spent more money for its expenditures such as public goods, public services including subsidy to the state-owned companies like IPTN.

2.   Government Revenues

Government revenues are drawn from domestic sources, mainly taxes and oil-related income, and foreign borrowings and aid. In the last decade, the oil and gas sector contribution has declined gradually. Government spending, after legalized by the "People of Representative," is allocated into two portions: routine expenses and development expenditure government wages, regional subsidies, and debt service payments are grouped in routine expenditures. Development budgets are spent based on development planning such as improvement of education, housing, transmigration, health, and others. During the past five years, the education, industry, mining, and industry sectors have received major budgetary allocations. Table 1 shows government revenue and expenditures each fiscal year (in US$ Billion) since 1990.
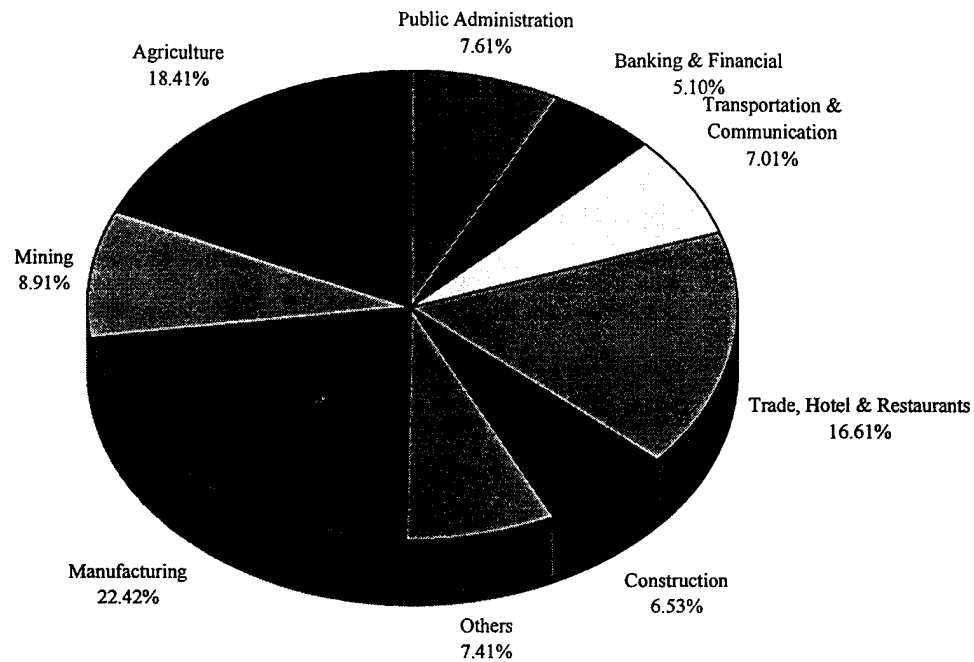
Figure 1. Composition of GDP, 1993
Source: Indonesian Central Bureau of Statistics, 1994

Year	1988	1989	1990	1991	1991	1993
PrivateConsumption	57.30	53.90	54.35	55.06	52.69	53.04
GovernmentConsumption	8.98	9.39	8.98	9.14	9.48	10.03
DomesticCapitalFormation	25.90	27.31	28.44	28.85	28.43	29.10
ChangeinStock	5.63	7.88	7.71	6.56	7.19	3.48
TradeBalance	2.46	2.34	0.52	0.39	2.21	4.35
Total (%)	100.00	100.00	100.00	100.00	100.00	100.00

Table 1. Composition of Expenditure in GDP Growth (in Percent)
Source: Indonesian Central Bureau of Statistics,1994

Fiscal Year	1990	1991	1992	1993	1994	1995*
Domestic Revenue:	14.35	19.80	20.80	23.70	26.15	29.50
Oil/Gas	5.60	8.85	7.50	7.65	6.25	6.40
Tax	7.70	9.85	12.05	14.55	17.45	20.05
Other Receipts	1.05	1.10	1.25	1.50	2.45	3.40
Development Funds	4.70	4.95	5.20	5.35	5.20	5.00
Total	19.05	24.75	26.00	29.05	31.35	34.85
Routine Expenditure:	12.15	15.00	15.10	17.00	19.40	21.15
Personnel	3.10	3.50	4.05	4.70	5.60	6.50
Materials	0.85	0.90	1.20	1.45	1.50	1.85
Regional Subsidies	1.85	2.10	2.40	2.65	3.40	3.55
Debt Service	6.00	6.70	6.70	7.60	8.65	9.00
Other	0.35	1.80	0.75	0.60	0.25	0.25
Development Expenditure:	6.90	9.75	10.90	12.05	12.80	13.70
General	2.70	5.00	6.50	6.55	7.54	8.52
Project Aid	4.20	4.25	4.40	5.10	4.45	5.00

*State budget as announced January 1994

Table 2. Government Revenues and Expenditures (in US$ Billion)
Source: Indonesian Ministry of Finance, 1994

Government routine expenditures including debt service are increasingly coupled with project aid. The expenses were covered by domestic tax, of which income tax growth has been a primary source of Indonesia's tax base. Income taxes are expected to contribute 31 percent of 1995 fiscal year budget. Repayment and servicing of foreign debt are the largest routine expenditure in the last year, almost 42 percent of the total.

3. Investment

Investment as the flow of expenditures on durable assets and the net addition to the inventory during Long-Term Plan Development Program have increased from domestic and foreign sources. Domestic investment in the manufacturing sectors between 1990 and 1994 was dominated by the chemical, paper, textiles, and non-metallic minerals industries. The cumulative investment of those sectors was 65.5 percent of total, as well as 23.6 percent in tertiary sectors such as hotels, office building, real estate, and transportation.[11] Since 1980s the inflow of foreign capital became significant; i.e. from US$ 8.5 million in 1988 to US$ 24.0 million in the end of 1994.

Most foreign investments, originated from Japanese enterprises, which spent capital in Indonesia of nearly US$ 17.7 billion or 21.1 percent of total during 1967 through 1994. Hong Kong and Taiwan which are interested in primary and secondary sectors, ranked below Japan with each invested 15.9 percent and 10.4 percent of total. Only a few developed countries with advanced technology were eager to invest in Indonesia, they were the United Kingdom (9.6 percent) in chemical and restaurant, the United States (8.4 percent) in mining and chemical, and the Nederland (8.0 percent) in chemical, food, and hotel.[12]

4. Interest Rates

The loanable funds market coordinates the action borrowers and lenders. This market permits government and business to borrow against their assets and expected income. The interest rate is measured in dollars and overstates the real cost of borrowing during an inflationary period.

Bank Indonesia regulates interest rates, refinancing facilities, controls the money supply , and the level of domestic credits. The primary tool used to control interest rates and money supply in Indonesia are SBIs, Bank Indonesia certificates of deposits which are

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[11] National Development Information Office, *Indonesia Source Book 1994* (Jakarta, 1994), p. 72.
[12] Ibid. p. 80.

auctioned through primary dealers; and SBPUs, a short term tradeable securities is one of interbank money market instrument.

The value of the rupiah (Indonesian currency) is closely linked to the U.S. dollar, it is tied to a basket of currencies of Indonesia's main trading partners, the SDR of the IMF, and the value of the rupiah is determined by Bank Indonesia on a daily basis. As of mid August 1995, the rupiah was valued at 2,238 against the dollar.[13]

The government is committed to support the development of domestic financial markets, by the mobilization of capital. Improving capital markets by broadening private-sector involvement in the ownership, management, and operation of financial institutions, and by deregulation the banking industry, privatizing the stock exchange, and improving the climate for the private investors. The BEJ, the managing firm of JSE, were privatized in April 1992. These firms are owned by 205 broker firms, which have set minimum standards in paid-in capital level, expertise, and initial payment.

The capital markets are an important source of financing in Indonesia, the largest of the money exchanges is the JSE (Jakarta Stock Exchange) which has an average daily trading volume 15.6 million shares, while its value has increased to US$ 38.8 billion[14]. On the JSE 43 companies have bonds listed. Foreign investment, is limited generally to 49 percent of Indonesian companies' listed shares, represented 30 percent of the market in the Composite Price Share Index (CPSI).

In the future, when IPTN needs more capital to finance the research and development for a new type of aircraft and when at the same time government is reducing its subsidy, the capital markets will become partners in financing the project based at commercial rates.

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[13] "Valuta Asing-Emas," *KOMPAS* (August 11, 1995).

[14] *Indonesia Source Book*, p. 65.

5. Inflation

Inflation is continuing to rise in the area of prices of goods and services. The domestic purchasing power declines when inflation is present.

Most of economic decision-makers in Indonesia base the future expectations on actual outcomes observed in recent periods, they maintain the country inflation below two digits annually. It appears that "tolerable" price stability for an underdeveloped economy should be in the range of 4 to 6 percent annual rate of price increase.[15] For moderate price increases, the Bank Indonesia controls money supply by increasing minimum reserve requirements on the banks, or in the open markets temporarily, or by moderating foreign credit expansions in state-owned companies. For example, the government reduced domestic fuel subsidies in the 1993/94, it caused an inflation of 9.77 percent.[16] The rate of inflation in the middle of 1994 was recorded as 6.85 percent,[17] as an economy-wide measurement. One of its parameters uses a price index of manufacturing sector, is derived from volume and value estimates of the GDP deflator with an index (1987=100[18]), it tended to increase since 1974 as shown in Figure 2.

6. Debt Management

The Indonesian government's total external debt outstanding as of December 31, 1994 stood at US$ 58.6 billion, with the state-owned companies at US$ 5.0 billion, and private companies at US$ 24.0 billion.[19] There is no direct government short-term debt. Most of foreign debt is comprised of long-term loans and export credits through recommendation from the CGI (Consultative Group on Indonesia) members, the World Bank, and the IMF.

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[15] Gerald M. Meier, *Leading Issues in Economic Development* (New York: Oxford University Press, 1995), p. 179.

[16] Op.cit. p. 36.

[17] Ibid.

[18] *World Tables 1994*, Published for the World Bank, (Baltimore: The Johns Hopkins University Press, 1995), p. 348.

[19] Anwar Nasution, *"Lalu Lintas Modal dain Kebijaksanaan Moneter dalain Era Keterbukaan,"* *KOMPAS* (August 11, 1995).

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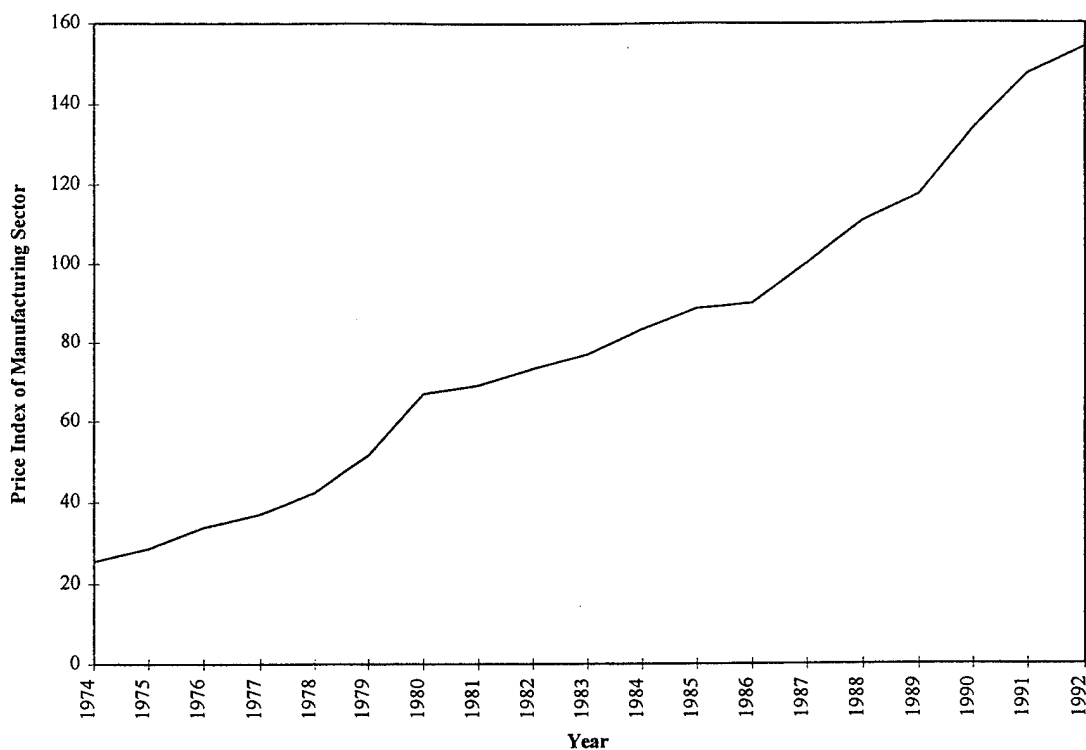
Figure 2. The Manufacturing Prices as GDP Deflator, 1974-1992
Source: World Tables 1994, The Johns Hopkins University Press, Baltimore

State-owned companies are responsible for all debts they assume, unless an indemnity is expressly given by the government. Total foreign debt from 1981 to 1994 in US$ millions is shown in Table 3.

The ratio between foreign debt and GDP, and foreign debt and export since 1987 has become larger and larger. Almost 40 percent of Indonesian debt is in yen, when yen appreciation against the dollar, increasing to 112 yen in 1993, it increased Indonesian debt automatically to US$ 13 billion, this was 20 percent of the total debt in 1993. Between 1984-87, total debt was US$ 11 million, but the government's income was just US$ 8.4 million, so the net transfer abroad was US$ 2.6 million. In 1995 the total debt is expected to increase, in response to the stronger yen in the first period of 1995, and because most of the current

foreign capital is from short-term loans. The foreign debt is sensitive to the global economy turbulences, lender countries, international market interest, appreciation of international currencies, and primer commodity prices.

Year	Government	State-Owned Companies	Private Company	Total	Debt / GDP (%)	Debt / Export (%)
1981	14.6	1.9	-	16.4	25	91
1982	17.8	1.9	-	19.7	28	118
1983	21.1	1.7	-	22.8	37	152
1984	21.2	1.7	-	22.9	38	144
1985	27.3	1.5	-	28.8	44	182
1986	33.2	1.5	-	34.6	56	268
1987	38.4	1.2	-	39.6	73	278
1988	40.5	3.5	8.5	52.5	67	252
1989	40.4	0.8	-	41.1	62	220
1990	44.9	0.6	-	45.5	66	224
1991	45.5	3.8	18.0	66.3	69	227
1992	50.9	4.5	20.0	75.3	67	219
1993	55.0	5.0	23.0	83.3	66	219
12/1994	58.6	5.0	24.0	87.6	-	-

Table 3. The Indonesian's Foreign Debt, 1981-1993(in US$ Billion)
Source: Anwar Nasution, *KOMPAS*, August 11,1995

B.   MANUFACTURING

The term manufacturing in Indonesia excludes oil and gas manufacturing. As a main engine of economic growth, manufacturing has a positive impact in labor markets, transfer of technology, and increasing the nation foreign trade. Based on Indonesia capital and orientation, it has a large, medium, and small scale manufacturing sector. As in other

developing countries, the typical of industry policy is dualism, modern firms and household firms, where the largest portion of production volume and value is derived from large- and medium-scale enterprises. On the other hand household firms provide more employment for the villages.

1. Major Manufacturing Sectors

The major manufacturing sector is made up of the following:

- Heavy Industry and Machinery; steel and other metal products are important in supporting highway construction, buildings, and various manufacturing. Most of the steel types are general, IPTN still imports for its specialized metal needs materials such as aluminum plate and bar, and stainless steel.

- Basic Metals; is dominated by the a state-owned company (Krakatau Steel), in 1993 it produced 1.4 million tons of sponge iron, 1.1 million tons of steel slabs, 1.1 million tons of hot roll coils, 650,000 tons of steel billets and 380,000 tons of coiled rolled sheet. The process of smeltering, reduction and casting of aluminum is carried out by another similar company (Inalum), where more than 65 percent of the product was exported. Product of basic metal is usually processed with advanced technologies in the developed countries.

- Tools and Equipment; many small machinery industries exist to produce farm equipment including mini-tractors and hand-tractors, drilling equipment, lathes, presses. These manufactures are both joint ventures and domestic companies. Almost all IPTN equipment is imported. Because aircraft manufacturers requires precise measurement IPTN requires higher quality equipment then can be produced domestically.

- Automotive; the characteristic of domestic manufacturers is assembler from CKD (Completed Knock Down), the amount of local content is limited and is general such material as laminated glass, tires, painting, etc. The automotive sector's contribution to IPTN is not significant.

- Shipbuilding; as of mid-1994, Indonesia had 200 shipyards to serve domestic clients, with an annual capacity of more than 140,000 tons for shipbuilding and 2.5 million tons deadweight for repair. This sector does not have a close relationship with IPTN, although there is some coordination.

- Electrical and electronics; export in electrical and electronics increased almost 49 percent in 1993 with the primary markets North America, the EC, and the Middle East. IPTN receives skilled personnel from this sector, some companies have already joined with IPTN for electronics support.

2. Basic and Light Industry

The basic and light industry is made up of the following:

- Chemical industries; these sectors have a large investment in fertilizers, organic chemicals, agrochemicals. As a downstream industries, they generated other industries in textiles, plastics, paper, tires and footwear with a total value of investment of US$ 9 billion. IPTN used several domestic products in its production, such as paints, paint removers, and other products.

- Textiles and Garments; this sector contributes US$ 6.18 billion to the country income in 1993 and this is the largest contribution from the non-oil sectors. IPTN uses local cotton materials, but specialized fabrics are still imported.

C. THE AIRCRAFT INDUSTRY SECTOR

As an aircraft manufacture, IPTN has grown fast, from a small company of about 500 people in 1975 to one with more than 15,000 employees engaged in producing fixed-wing and rotary-wing aircraft. Its modern facilities are located at the Air Force base called Husein Sastranegara in Bandung.

1. General Characteristics

Aircraft manufacture is a source of employment for skilled workers, scientists, engineers, and technicians despite the unreasonable investment required. No other industry, forced by technological necessity, is so fraught with risk, competition, and requirement of the market stimulate technological and product advances that contribute to conditions of the industry. The competition creates a constant pressure on fares and efforts are being made to reduce costs and improve operating efficiency. For reasons of economic growth, improved foreign trade, and prestige, there are many entrants in the aircraft industry.

Aircraft frame and engine manufacturing is becoming internationalized,[20] through the methods of co-production, joint ventures, and offset agreements. The growing capital requirements, increased risk, and greater technical complexity create pressures to form

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[20] The U.S. Civil Aviation Manufacturing Industry Panel, *The Competitive Status of the U.S. Civil Aviation Manufacturing Industry*, (Washington DC: National Academy Press, 1985), p. 5.

partnerships. Developing a new aircraft requires from four to six years and return on investment will require at least 10 to 15 years[21].

Total cumulative investment for IPTN from period 1976-1994 was US$ 1.1 billion[22]. IPTN is supported by government involvement in the financing of the N250 project. For example, the N250 price, according to IPTN[23], was US$ 9 to 10 million per a new airplane in 1990. Selling in the aircraft industry is done very differently from that of any other product markets, where price plays a minor role in sales, whereas performance, maintainability, and on-time delivery will often be more important than the price in any sale.

Aeronautical technology is categorized[24] into seven areas: 1) design, 2) aerodynamics, 3) flight controls, 4) structures and 5) airframe, 6) avionics, and 7) propulsion. The N250 twin-turboprop, pressurized 64 passenger regional transport, the technical categories are described:

- Design Techniques: a 64-seat at 32" pitch is designed by IPTN used CAD/CAM in Indonesia.

- Aerodynamics: for the development of the basic specification of the N250, the model used to understand the laminar-to-turbulent-flow transition was tested at the Serpong Laboratory of Structures in Indonesia.

- Airframe: almost all airframe components are made in country based on new materials such as new high strength-to-weight alloys, new superplastically formed metals, and composite materials that are imported from the U.S.

- Flight controls: the N250 flight control system is a three axis fly-by-wire system which allows control organization for enhanced flying qualities and reduces the mechanical complexity and improves aircraft stability is manufactured by a U.S. company.

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[21] Ibid. p. 6.

[22] IPTN, *Company Profile* (where?, 1994), p. 13.

[23] Francois Raillon, *Indonesia 2000 the Industrial and Technological Challenge*, (Paris: CNPF-ETP&Cipta Kreatif, 1990), p. 119.

[24] Op.cit. p 7.

- Avionics: since the U.S. leads the world in avionics, and the electronic system are vital to implementation of active flight controls and computer-integrated flight management system; most of the system is supplied by Rockwell, a U.S. company.

- Propulsion: the N250 is powered by two Allison AE 2100C turboprop engines and six bladed Dowty Aerospace (British Company) propellers.

2. Market and Competition

The cost of developing a new prototype of an aircraft can make, or break, a multimillion-dollar enterprise. There are many economic factors that affect the business environment domestically and internationally, these factors determine the success and failure of individual firms as well as the politico-economic environment that surrounds the aircraft industry. Immense capital and R&D requirements provided a natural barrier to market entry making it almost impossible for the new entrance to join the industry[25].

Aircraft contracts involving guaranteed in: on-time delivery, interchangeability of engine configurations, and after sales service. Thus, it makes contractors build parallel production facilities and to anticipate disruption of production. Many players from both developed and developing countries in the commuter market are in this predicament. The N250, despite its penetration into some important markets, the N250's long-term success is not easily predicted. The government ability to protect the price and manufacturing facilities has possibilities, but the government does not have unlimited funding.

Since the U.S. market is large, open, and attractive and U.S. technology and aircraft components are readily available, according to *Indonesian Journal,* June 95 edition, the IPTN will transfer N250 production to Mobile, Alabama. This new transplant factory will buy parts, engineering services, and acquire the FAA certificate. On the other hand the U.S. has high labor cost of productivity. The evidence on labor productivity in the U.S. comes

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[25] Barry Bluestone, et. al., *Aircraft Industry Dynamics,* (Boston: Auburn House Publishing Company, 1981), p. 55.

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various outputs in the U.S. and the U.K. which gives the same level of unit costs for a subsonic airliner (e.g., Trident or DC 9). See Table 4.

Unit Cost for Subsonic a/c	Output in USA	Output in the UK
46	63	25
32	133	50
25	205	75
21	300	100
17	500	150
17	500	150
15	633	200
26	306	100

Table 4. Unit Cost and Output in USA and UK
Source: Hartley, Keith, A Market for Aircraft, The Institute of Economic Affair, London, 1974

The table shows the U.S. advantage in output rather than the U.K., once output is standardized, productivity in the U.S. industry is about 1.5 times that in the U.K. At the time (1960s) American Labor costs were about three times that of the U.K. Thus if the U.K. produces 50 aircraft, the U.S. would build 133 units based on the same unit cost (32). The unit costs of the U.S. aircraft were about 17.5 percent less than in the U.K.

In the aircraft market, price has a secondary role after quality, reliability, and on-time delivery[27]. Post-sale support is a key element in aircraft procurement, because aircraft operators are concerned with ease of service, product reliability, parts availability, and the low long-run operating cost.

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[27] Ibid. p. 81.

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D.   IPTN's ENVIRONMENT

1.   External Environment

The segment of the global markets for commuter aircraft is large, open, and attractive. Once a brand name has a reputation of quality, the price becomes a secondary factor. An example is the Lockheed C-130. Almost all of the Air Forces of the world operate this aircraft. But, on the other hand, there are too many requirements to enter a similar, competitive aircraft markets. There are many players eager to enter the market, although the business is risky with high capital spending and global competition. IPTN is a state-owned company almost completely dependent on the government monetary condition. The Indonesian government will continue a subsidy as long as IPTN output is below the break even point. Unfortunately, Indonesia's income per capita is just US$ 676 in 1993. This means that Indonesia is still among the low-income developing countries (LDC) category. Thus, most of the Indonesian people still need more budget subsidy to improve quality of life, as well as, the quality of an industry sector i.e., IPTN as a domestic supplier.

2.   Internal Environment

The strengths of IPTN is its real property, including the skilled personnel who have been trained abroad and its manufacturing facilities since 1976. IPTN has invested multimillion US dollars in its business, if it cannot optimize its strengths, sooner or later the company will be bankrupt as a result of misalignment of its strategic management. IPTN as a national asset should discover its weaknesses and become a competitive company in the global market.

III. FROM NURTANIO TO IPTN

A. GENERAL

Started in an Indonesian Air Force hangar in Magetan, East Java in 1947, the Zogling-type glider was built by Wiweko and Nurtanio, they named it NWG (Nurtanio-Wiweko Glider) and it was the first aeronautical creation in Indonesia since independence in 1945. A new start was made during 1950s under Nurtanio's leadership, the Air Force built a small single engine aircraft, Si Kumbang NU-200 as an experimental airplane. In the early 1960s, when the foreign policy closed access to East Europe, Indonesia developed the single engine four-seater PZL-104 which was assembled under license from Wilga, Polish. Hyper inflation and the death of Nurtanio in 1966 had an impact in the decline of the national aircraft industry, after the assembly of around 70 aircraft. The Indonesian oil company, Pertamina gained capital in dollar during oil boom in 1973. Under Pertamina support in 1976, Mr. Habibie presented the aircraft industry with a new method, combining personnel from the former factory, and young technicians from Pertamina under supervision of a group of Indonesian engineers trained in Germany. The government gave the new company's the same name as the founder, NURTANIO Aircraft Industry.

NURTANIO's first international collaboration was with CASA Spain, where Indonesia got a license to assembly NC-212, a small turboprop transport aircraft. Later NURTANIO also joined with Aerospatiale (France), MBB(Germany), and Bell(USA). With political reasoning, on February 4, 1986 Government decided to change NURTANIO into IPTN.

In the last decade, IPTN has been an obsession with launching the first Indonesian modern aircraft N250, and entering the commuter segment of the global market for aircraft.

1. Basic Argument for Aeronautics Development

Based on the assumption that Indonesia needs many small and cheap planes in the future, and that foreign markets especially in North America are forecast to grow at an

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1.   **Basic Argument for Aeronautics Development**

Based on the assumption that Indonesia needs many small and cheap planes in the future, and that foreign markets especially in North America are forecast to grow at an average of 4.4 percent per year through 2010[28], Indonesian State Minister for Research and Technology/Chairman of the Agency for the Assessment and Application of Technology (BPPT) argued:

> If I want to jump to a higher level, I will always have a debate on my hands both in Parliament and in society, and all these doubts as to whether we can do it or not. But since we started at the highest level of technology with aerospace, where quality is Number One, where cost is Number One, and schedule is Number One, and everything has to be increased and controlled with the use of computers and integrated systems, that means high technology. So it is easy now for me to go ahead with other things.[29]

Minister Habibie is one of the Indonesian "technologists" group with their concept that emphasized the development of domestic industries not only for basic industries and raw materials but also for the production of capital and intermediate goods, as well as the strategic high-tech industries such as IPTN. Their approaches are through three stages of industrial development:

- The government introduces import restrictions on certain consumer goods, machinery and capital goods investments, and the components used to manufacture these goods are eventually subject to import prohibitions and have to be produced locally, this so-called import substitution policy.

- Unprocessed domestic products which were exported, are subject to an export prohibition, exporters should process their commodities into value-added goods, this approach is called export substitution policy.

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[28] IPTN, N250-100 for U.S. Airline Regional Operations, April 1994

[29] Francois Raillon, *Indonesia 2000: the Industrial and Technological Challenge*, (Paris: CNPF-ETP&Cipta Kreatif, 1990), p. 107.

- The third approach is government to promote industrialization by taking over production in heavy and strategic industries, including subsidy to IPTN.

2.   Organization

As a state-owner company, IPTN is under the coordination the Agency for Strategic Industries Management (BPIS) with other companies such as PT PAL (shipyard), PT INKA (railway's coach), PT INTI (telecommunication). IPTN is headed by its president-director, who is assisted by nine directors and eight division chiefs. Staff echelon consisting of secretariat, method development, engineering office, quality control, and computers. Directors under the president-director are finance, general affairs, production, program coordinator, equipment, universal maintenance center (UMC), aircraft services (ACS), commerce, and technology. Director of production has six subordinate divisions, they are industrial engineering, production engineering, manufacturing, fixed wing, rotary wing, and weapon systems. On the other hand commerce director has two divisions, material & supply and the flight test center.

The manpower structure is approximately seventy percent direct manpower and thirty percent indirect manpower such as administrative support. IPTN distributes the workers mainly in Bandung its aircraft manufacturing center, and with just three percent of the workforce in Tasikmalaya at the rocket assembling plant, and two percent in Madura at the under water torpedo assembling plant of the Weapon System Division.

An important question is why marketing is not one of the divisions of IPTN. Another question as well is why other functional divisions are missing that are found in most aircraft manufacturing organizations. In most industries, marketing is one of the most important divisions of the company and it is difficult to see how any company could operate without an active and aggressive sales force.

In most industrialized nations, the market for companies is a very active institution where many products are bought and sold every year. Markets, where sellers and buyers are
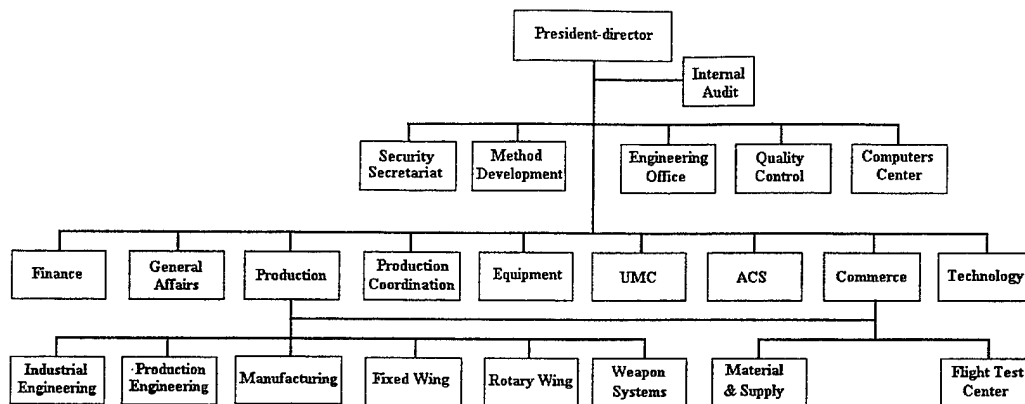
Figure 3. Structure of Organization of IPTN
Source: Raillon, Indonesia 2000, p108

seeking each other, is a media to fulfil the company's needs. According to Porter[30], another function of a market is to eliminate any above-average profits. If the company is profitable and well managed, this will have an impact in the market. But if its future is uncertain, its products price does not have the power to create a market. So far, marketing of IPTN's products has been done mostly through large air shows, such as Paris Air Show.

3. The Progressive Manufacturing Plan

Entering the second decade after its establishment, IPTN has grown from a small company of about 500 employees to a huge one of more than 15,500 workers in early 1994[31], despite the government subsidy to support the implementation method is known as the Progressive Manufacturing Plan[32].

The master plan, which was created not long after Minister Habibie was named as President-director in 1976, contains four-phases of the IPTN plan for the transfer of technology in the field of aeronautics and to realize a profit from its sales. This challenge is

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[30] Porter, Michael E., *Competitive Strategy*, The Free Press, NY:, p 351

[31] *Jane's All the World's Aircraft, 1993-94*, (Alexandria Virginia: Jane's Information Group Inc, date?), p. 125

[32] Raillon, *Indonesia 2000*, p. 109.

difficult to meet, IPTN would start from zero and would have to achieve an ambitious program of launching a brand new aircraft with an unknown reputation.

The approach introduced was for a four-phase of development:

- The First Phase is to utilize the existing technology, by importing it in completed condition and flight tested, then disassemble and reassemble it. Methods used where, under license, sub contract and offset programs with a number of world's aviation industry such as Spain's CASA for NC-212, French's Aerospatiale for helicopter Puma NAS-332, and USA's Bell-Textron for NBell-412.

- The Second Phase is a more intensive effort than just assembling equipment. In this phase IPTN active participants in the design stage of the aircraft development. The result are CN-235 and was released by FAA (the American Federal Aviation Association) in May 1989.

- IPTN has made a fully Indonesian design aircraft the third phase of its development program through the commuter airplane N-250. The entire process of manufacturing the airframe was done by IPTN at its facilities in Bandung, but the advanced technology's components are imported from abroad. For example: engine is manufactured by Allison(USA), the propeller by Dowty(UK), and "fly-by-wire" flight control system is by Lucas(UK).

- The Last Phase of the IPTN's Progressive Manufacturing Plan is basic research and development program for its products, such as development plan for design and manufacture of future products, N-2130 the double full jet engines 130-seat, which will be released after 2000. More than 1500 engineers and experts participate in the solutions to the complex problems, such as in materials, aerodynamics, noise, and construction.

B. PRODUCTION

The production complex covers 173 acres, IPTN owns two production areas, workshops and warehouses, a UMC (Universal Maintenance Center), and other huge facilities. Since 1976 the government has spent over $ 940 million as the IPTN assets[33] at the Husein Sastranegara Air Base Bandung. Investments, human or material, have been more than $ 500 million over 13 years. Assuming one-third of the total investment is non material,

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[33] Ibid. p. 116.

investment, and was basically in three divisions: building and facilities 24 percent, machinery 29 percent, and the rest is computers 4 percent[34].

1. Delivery Status

Most of IPTN customers are domestic airliners and the Indonesian government, including the armed forces. To protect the IPTN's production, import of similar class aircraft by the Indonesian airliners is prohibited. Like Brazil, Indonesia is not a signatory to the Agreement of Trade in Civil Aircraft[35]. On the other hand, the government gives subsidies, in the form of soft loans, to the airlines which are interests in buying the domestic products. Another government effort to support IPTN sales abroad is with the government to government approach. For example, the signing of a memorandum of understanding (MOU) between Indonesia and Malaysia on May 19,1994 in Jakarta[36]. Both nations agreed to a transaction, where Malaysia stated the intention to purchase six CN-235 aircrafts. In return Indonesia will send three C-130 the Air Force aircraft to be repaired by the Malaysian's company AIROD, purchasing MD-3 Malaysian made trainer aircraft, and also acquisition 1500 the Malaysian popular car, Proton Saga, to be replaced eldest taxi in Indonesia.

A total of 375 aircraft, of which 220 were fixed-wing and 155 rotary wing, were delivered up until January 1995 to domestic and international customers. This total delivery including the CN-235 produced by CASA of Spain in joint venture with IPTN, where Spain has marketing areas of Europe, America, and Africa.

Based on delivery records the customer, type, and number of aircraft are noted below:

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[34] Ibid.

[35] U.S. Department of Commerce, *A Competitive Assessment of the U.S. General Aviation Aircraft Industry*, (Washington D.C.: GPO, 1986), p. 51.

[36] Bulletin IPTN No. 112/113,1995, p. 15.

NO	CUSTOMER	NC-212	NBO-105	NSA-330	NAS-332	NBK-117	NB-412	CN-235
1	Airfast Indonesia	2						
2	Asahi Mantrust	6					2	
3	BPPT	4						
4	Bakrie Brothers		1					
5	Borsumy Wehri		1					
6	Bouraq Airlines	3						
7	Transportation Dept		1					
8	Forestry Dept		10					
9	Deraya Air Charter	4						
10	Immigration		1					
11	Dirgantara Air Service	2						
12	Freeport						2	
13	Gatari						3	
14	Gudang Garam		2			1		
15	Gunung Madu		2					
16	Curug Pilot School	3	5					
17	Indonesian Air Force	10		7				6
18	Indonesian Army	4	22				4	
19	Indonesian Navy	11	7		4		4	
20	Police		19					
21	State Secretary				2	2		
22	IPTN, demo				1			3
23	Merpati Airlines	22						15

Table 5. IPTN's Aircraft Delivery Status per Jan 30,1995
Source: IPTN's Public Relations

NO	CUSTOMER	NC-212	NBO-105	NSA-330	NAS-332	NBK-117	NB-412	CN-235
24	Pelita Air Service	13	36	4	4			
25	PLN						1	
26	SAR		2					
27	Sabang Merauke	4						
28	Sampoerna		1					
29	Transindo						1	
30	Trigana						2	
1	Binter Canarias							4
2	Binter Mediterranean							5
3	Bobhutastwana							1
4	Botswana							2
5	CASA, demo							1
6	CASA, USA							1
7	Chile							3
8	Equador							2
9	France Air Force							6
10	Fuerzo Aereas Spain							20
11	Gabon							1
12	Guahan Airways	2						
13	Iberia							
14	Irish Air							2
15	Malaysia, TUDM				1			
16	Morocco							7
17	Oman							2

Table 5. (Continued)

NO	CUSTOMER	NC-212	NBO-105	NSA-330	NAS-332	NBK-117	NB-412	CN-235
18	Panama Air Force							1
19	Papua New Guinea							2
20	RoK Air Force							12
21	KSA Air Force							4
22	Thai's Agriculture Dep	5						
23	Turkey							18
24	UAE							7
	TOTAL	95	110	11	12	3	19	125

Table 5. (Continued)

Besides aircraft, IPTN also assembles rockets, torpedoes, missiles, and supporting equipment, although in small amounts, as an option of its products or sold separately. The main products of the Weapon System Division are FFAR (fin folded air rocket) a 2.75 inches, SUT (surface underwater target torpedo), NDL-40 multi-launch rocket system, and NPU-70 (Nusantara poly-urethane) a surface to surface launching system. All of the weapon system are still in the experiment phase.

2. Fabrication

The Fabrication Division handles the processing of imported raw material to component parts readily for assembly and installation in the aircraft. This division carries out the manufacture of tools, jigs, parts for the company's products including fixed wing and rotary wing aircraft, weapon systems, as well as ground support equipment. IPTN has installed conventional milling machines, touch-in-numerical control (TNC) machines, and from 1985 it has operated computerized numerical control(CNC) machines.

Several supporting shops do sheet metal forming, subassembly, surface treatment, bonding and composite, and are under the supervision of the Fabrication Division. The latest

technology is used at IPTN to meet requirement for modern airplanes, like procedures in joining parts and materials using special adhesives.[37]

3. Universal Maintenance Center

Established in 1983, UMC was planned by IPTN to be a profit center among its divisions and is inseparable from other supporting industries like engine maintenance industry. UMC has facilities for the overhaul maintenance and repair of various aircraft engines, in addition to facilities for IPTN's aircraft products.

Certified by several engine manufacturers, such as Allison, Garret, General Electric, Pratt & Whitney, and Rolls Royce; UMC is expected to be able to support IPTN and reduce the sale price of its products, by receiving in engine maintenance work from IPTN's customer and other turbine engine operators.

UMC is equipped with modern facilities, which are needed to support the precise diagnostics, precision of measurement, efficient assembly, and testing. The division is capable of handling maintenance, repair, overhaul, and the accessories for 14 to 20 engines per month[38].

4. Aircraft Services

One of the unique aspects of the aircraft manufactures management is consumers always have a close relationship with the producer. The producer receives feedback from the consumer for improvements in the performance of the aircraft. The customer's complaint, as an authentic data from the field, is then compared with other reports. The input will then be processed through Air Craft Services(ACS) and other related divisions to obtain a solution. After the solution has passed several testing stages, the manufacturer develops a publication, which may contain several customer problems and solution suggestions.

The ACS role is important in after sales service, including technical and engineering support, spare support, maintenance, overhaul and repair, and customer training. IPTN has

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[37] Bulletin IPTN, SP/MK/IPTN/IX/1994

[38] UMC, PT IPTN SP/MK/IPTNX/Z1994

already developed a round-the-clock communication system, operating seven days a week, to support the customer's needs in supply efficiency.

IV. THE GENERAL ENVIRONMENT OF IPTN

A.   GENERAL

A number of factors dictate IPTN strategies, they are the general environment (social, technological, political, economic), the industrial environment (competitive, market, industry structure, suppliers, customers and other significant issues) and environment of the organization itself. Where James K. Brown defines an issue as:

> ...condition or pressure, either internal or external to an organization, that, if it continues, will have a significant effect on the functioning of the organization or its future interests.[39]

These issues should be bottom-line issues, because the IPTN strategy is always confronted with global trends, especially in the commuter-class markets. As Michael Kami wrote[40] the success of organization plans come from outside the organization, not from the inside out. Based on environment assessment approach, Bryson[41] identified that the internal environment of an organization might contain both its internal strengths and its weaknesses. On the other hand, opportunities and threats may be discovered by observing a variety of external environment trends. This chapter will discuss the organization, the aircraft industry environment, and the relevant general environment respectively.

1.   The Organization

In a large organization, such as the IPTN, several levels of management structure may be involved in strategic decision-making. Decisions may be shaped by all involved in the

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[39] Lester A. Digman, *Strategic Management: Concepts, Processes, Decisions,*, (Houston Texas: Dame Publications Inc, 1995), p. 10-4.

[40] Ibid. p 10-5.

[41] John M. Bryson, *Strategic Planning for Public and Nonprofit Organizations*, (where?: Josse-Bass Publisher, 1988), p. 50.

process of performing the analysis, from the chief engineer through the president-director, to satisfy stakeholder wants and needs. Where stakeholder is defined as:

- One who has a stake (sense) in something, especially a business (*The Oxford English Dictionary*).[42]

- A person or group that has an investment, share, or interest in something, as a business or industry (*The American Heritage Dictionary of the English Language*).[43]

Adopted from the 1978 book *Strategic Planning and Policy* by King and Cleland, Digman defines stakeholder as a claimant view of company responsibility.[44] Thus the stakeholder of IPTN are those individuals or groups who have a stake, or claim, with IPTN:
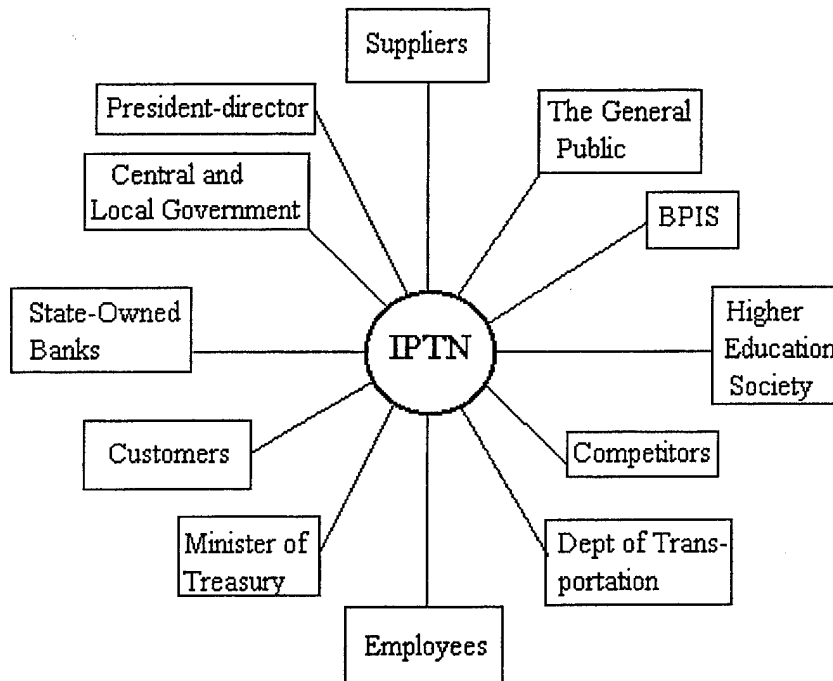

Figure 4. Stakeholder of IPTN

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[42] *The Oxford English Dictionary*, Second Edition, Vol. XVI, 1989

[43] *The American Heritage Dictionary of the English Language*, Third Edition, 1992

[44] Digman, *Strategic Management*, p. 6-15.

Obviously, IPTN involves a variety of stakeholder. They are:

Agency for Strategic Industries Management (BPIS) as a stakeholder with an interest in the election of board of directors. BPIS is chaired by the State Minister for Research and Technology. This institution has been assigned to coordinate state-owned companies including their management, technical guidance and control of state-owned enterprise operating in the field of strategic industries. BPIS works like a holding company striving to enhance technology use, productivity, and the efficient operations.

Minister of Treasury as stockholder with the interests of the inspection of company books, and participation in distribution of profits and assets on liquidation. He/she reports the state-owned companies profile to the president yearly. Especially in the case of IPTN, most policy direction comes from the president based on the President-director's proposal.

State-owned Banks, as creditors, their interest is in a legal proportion of interest payments due and return of the principal of their investment. The cumulative investment in IPTN during the development period of 1976 - 1994 was US$ 1 Billion,[45] this source of government subsidy is not from official budget, but is taken from saving. That source is called "off budget."

Employees, have an interest in economic, social, and psychological satisfaction. The total number of employees is 15,500, most of them are under 40- years old with the composition of: 24 percent with high educational level, and 60 percent have passed high school.[46] This environment is different from industrial environment in U.S., in Indonesia workers and labor unions have long recognized the vital role of new technology in the competitive climate, they are aware that dialogue among management, workers, and the union representatives is beneficial[47].

Customers of IPTN's products, have interests in the services provided, technical data, suitable warranties, spare parts, R&D leading to product improvements, and customer credit. Customer complaints usually concern the nature of a slow response for service and information from IPTN.

International and domestic suppliers, direct their interest to a continuing source of business: credit obligations, contracts, purchasing, and receiving goods and

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[45] IPTN, Roll Out N250, p. 13.

[46] Raillon, *Indonesia 2000*, p. 115.

[47] U.S. Civil Aviation Manufacturing Industry Panel (Washington D.C: National Academy Press,1985), p. 71.

services. Since the local content of IPTN product is low, dependency on the international suppliers is high. The import-savings figures have to be based on an expenditure which would have been incurred in the absence of purchases from the domestic industry. For this purpose the figure of domestic sales has to be adjusted for any purchases of higher-cost products and for government subsidies.

- Central and local governments, whose interests are taxes, customs, properties, legal, and protection. The IPTN industrial areas have impacts to local area facilities, such as utilities, water, waste treatment, and environment. IPTN receives financial and political support from the central government, in turn the government targets the aircraft sector for rapid development to promote industrial prestige and technological progress.

- Competitors have an interest in norms and regulations established by the global aviation communities, with an interest in the place of productive and healthful employment of the community. Michael E. Porter[48] wrote that the industry is the arena in which competitive advantage is won or lost. There is no one universal competitive strategy, and only strategies tailored to the particular industry and to the skills and assets of a particular firm succeed.

- The general public and society, as a whole, has interest in fair price for products and the company fair profit for the company. Customer of the airline usually has a favorite aircraft which they prefer to fly.

- Higher education groups, have an interest in IPTN contribution to domestic education. IPTN hires higher education graduates from surrounding Bandung, because their schools usually are in agreement with IPTN values and sub-culture. According to Occupational Profile of the Aircraft and Parts Industry 1970[49] based on the U.S. Bureau of the Census of Occupations, percentage of industry employment of professional is shown in Table 6.

Collaboration between the higher education and industry, not only as technology donor-recipient, but is also interactive and has a participative nature. According to GV Kamala[50] the anatomy of a relationship is:

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[48] Michael E. Porter, *The Competitive Advantage of Nations*, (New York:The Free Press, 1990), p. 34.

[49] Bluestone et.al., *Aircraft Industry Dynamics*, p. 131.

[50] G.V. Kamala, "Academia - Industry Interactions in Developing Countries," *Journal of IEEE*, No. 0-7803-0161-7/91 (July 1991), p. 460.

- Industry has the problem, the school's have influence because the problem is relevant, attractive and a challenge, industry needs are for feasibility solutions.

- Organization-Consulted, this means commitment and deliverability of research.

- Organization-Consulting, in terms of techno-economic capability, credibility, and commitment.

- Benefits, both parties receive benefits during interactive learning and mutual advancement. Other benefits trigger indigenous R&D, industry receives high quality research, and increases its industrial competitiveness. In the long term both will increase their economic development, income revenue, and savings.

- Organization-Supporting, is a policy of openness in the company.

Number	Occupations	Percentage
1	Aeronautical Engineers	5.91
2	Mechanical Engineers	2.36
3	Drafters	2.04
4	Science Technology Engineering	1.67
5	Accountants	1.58
6	Electrical Engineers	1.5
7	Industrial Engineers	1.46
8	System Research Operatives	1.05

Table 6. Occupational Profile of the Aircraft Industry
Source: U.S. Bureau of the Census of Occupations, 1970

- Department of Transportation of a consumer country, has interest in airworthiness certification. United States is the largest market in the world (57% as of 1 March 1995[51]) and is recognized as the authority in commercial aircraft certification. For example, after CN-235 attained the Federal Aviation Administration (FAA) certificate Part 25, which covers transport aircraft, in late 1986, there was an increase in number of airplane sales.[52]

- President-director represent the management board. Minister Habibie has an imperial style,[53] framework of strategy, with the leader of a small top team driving the strategy, while the commander provides direction, on the other hand the organizational members obey orders as if they were soldiers. IPTN is called a strategic industry, and is controlled directly by Minister Habibie. Also as Minister Habibie is the BPIS chairman, and has more than twenty important positions in steel, machinery, explosives, shipbuilding, telecommunications, arms, electronics, free trade zones, and the railway industry. Yet the president has given his full support to this undertaking.

2. The Industry Environment

The industry structure in which IPTN competes is dynamic where competitive position reflects an unending battle among competitors. To analyze the structure of the commuter aircraft market, useful tools used are the inner/outer circle model and Porter Model.

To understand the position of IPTN in the global commuter aircraft market, the inner/outer circle model suggests that there are rarely more than three inner circle players in a particular market. Other players can usually be categorized as niche players. Based on past sales volume and revenue data, where the percent share by region is Europe (27 percent), Middle East and Africa (4 percent), South America and Caribbean (4 percent), North America (57 percent), and Asia Pacific (12 percent) the position of the players can be determined and we can identify the players in the inner or outer circle of a particular market.

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[51] *INTERAVIA* (April 1995), p. 32.

[52] IPTN, Bulletin No.SP/MK/IPTN/X/1994

[53] Digman, *Strategic Management*, Table 6.2, p. 6-12.

The global market (owned and leased) rank for commuter aircraft as of 1 March 1995 is:[54]

- Saab 340 and 2000 (Sweden)   358 each
- BAe Jetstream 31, 41, and 61(United Kingdom) 476 each
- Embraer EMB-120 (Brazil)   286 each

According to the theory, other manufacturers are in the outer circle. They are shown in Table 7. The world commuter's market is dominated by the big three. They are established and secure in the inner circle position, surrounded by the outer circle manufacturers. (See Figure 5)

With a look at the past sales, the IPTN can be considered in a periphery position. David D. Hood[55] related a classic example in the automotive industry. In the U.S. market General Motors, Ford, and Chrysler are known as the players in the inner circle. Most of the outer players have been acquired (e.g. Jeep by Chrysler) or have been bankrupt (e.g. Studebaker, Nash). Foreign car manufacturers, in the outer circle, uses niche strategy to penetrate a segment of the market (e.g. Jaguar, Rolls Royce, Mercedes Benz, BMW, Infinity, and Acura, for example, and maintain their quality among "fanatic" consumers).

If IPTN is able to penetrate the commuter segment of a global market, it might use a niche strategy. Where IPTN can specialize in a variety of ways; by product type (e.g. high quality, lifetime warranty of commuter airplane), by type of customer (e.g. cargo airplane), or by geographical area (e.g. tropical/corrosion resistant airplane). If it choose this strategy, IPTN must dominate the niche, because of the nature and characteristics of the aircraft industry.

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[54] *INTERAVIA* , April 1995, p. 22.

[55] David D. Hood., "The Link Between Business Strategy and Technology Development," (Northrop Electronics System Division-Hawthorne Site, Paper IEEE, No. 0-7803-0161-7/91), p. 72.

Type	Ordered	Delivered	Percent Share
Category 10-19 seat			
Beech 1900D	N/A	133	20%
Dornier 228	222	219	32%
Fairchild Metro	104	75	11%
Category 20-39 seat			
DHC-8-100/200	299	287	29%
Dornier 328	151	21	2%
Category 40-59 seat			
ATR 42	284	274	44%
Canadair RJ	98	57	9%
DHC-8-300	110	103	16%
Fokker 50	201	186	30%
Category 60-90 seat			
Avro RJ 70/80/100	72	30	6%
ATR 72	152	141	29%
Fokker 70	44	1	0%
Fokker 100	274	262	53%

Table 7. Current-Production Aircraft on Order and Delivered as of 1 March 1995
Source: *INTERAVIA*, April 1995
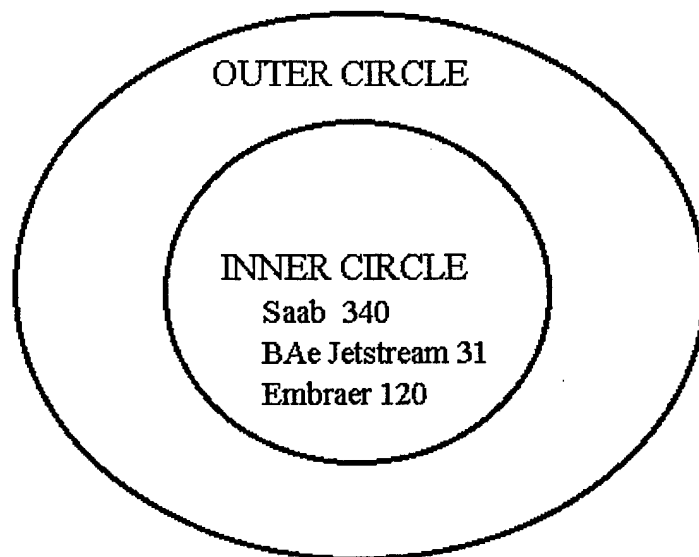
Figure 5. Inner/Outer Circle Model

As a new entrant, IPTN must develop a sophisticated understanding of the structure of the aircraft industry and how it is changing. The Porter Model is a market analysis tools, it prompts a business to evaluate its competitors, the threat of potential new entrants, the bargaining power of suppliers, the threat of alternatives, the bargaining power of customers, and channels used to reach customers.[56]

The market for aircraft is worldwide and homogeneous in character, and the customers are highly sophisticated. The choice of a particular type of aircraft is a critical decision for the consumer, because once made, the decision commits the customer to a

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[56] Porter, *The Competitive Advantage of Nations*, p. 35.

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particular type of equipment over a long period of time. The customer will carefully study the various options in the market segment, they will also weigh the experience of other consumers. Communication in the airline industry is open, and the performance of an aircraft type quickly becomes known, despite its selling price.

a. Rivalry Among Existing Competitor

The economic forces implicate traditional rivalries in the market for the commuter segment, the inner players (Saab, BAe, and Embraer) can more easily offer attractive prices, products, distribution, and after sales services. Based on these advantages they are potentially more cost effective, have better market access, and present a difference in products, services, and commitment. The higher costs of competing, such as expenditure for advertising, marketing, and R&D will not have as great of an effect on the companies profit in competitive sales.

Competition among producers in the market is risky, some of them share both risk and capital financing, the European aircraft manufacturers made concessions for sales to organization,[57] such as:

- The BAe's Jetstream 41, which claimed a backlog of 100 out of 139 orders, just delivered 39 aircraft in an ongoing joint-venture agreement with ATR consortium, the most popular aircraft in North America.

- Joint venture between DASA (formerly MBB, Germany), Samsung (Korea), and Aviation Industries of China to build a 100-seat aircraft.

Higher costs of competing, such as expenditure for advertising, marketing, and R&D will reduce profits in competitive sales.

b. The Threat of New Entrants

Besides IPTN, the entrants in the same market segment are Japan's 100-passenger YFX turbofan, Fokker 70, Saab 2000, 64-seat Ilyushin Il-114, 100-passenger Tu-

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[57] *INTERAVIA*, "Regional Airliner Census," (April 1995), p. 31.

334, Bombardier Dash 8-400, and the 70-seat Canadair RJX. The threats of new entrants limits the overall profit potential, because each of them has their comparative advantages, brand loyalty, and economies of scale. In Table 8 according to the BAe projection, is the forecasting of regional turboprops aircraft deliveries.

c. Bargaining Power of Buyers

The effects of these forces will force prices down, high quality products, more services, and competition are encouraged. On the other hand buyers would have more selections, switching costs, differentiation, and entry barriers. IPTN on its latest product, N250, offers a "fly by wire" control system, beside controlling an aircraft this also directly affects the flight performance, speed, and flight quality. This system was adopted from a higher class transports, the A320. But economically, the price may well decrease after IPTN succeeds in providing quantities of aircraft. This is supported by the learning curve in the policy analysis theory.

Year	19-seat	30-seat	50-seat
1995	40	105	57
1996	38	103	58
1997	37	113	61
1998	35	115	62
1999	35	120	62
2000	38	114	66
2001	37	107	64
2002	39	108	64
2003	35	101	59
2004	36	99	57

Table 8. Forecast of Regional Turboprops Aircraft Deliveries, 1995 - 2004
Source: Jetstream's J71 forecast, *INTERAVIA*, July/August 1995, p 25

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                    ┌──────────────┐
                    │  Threat of   │
                    │ New Entrants │
                    └──────┬───────┘
                           │
┌──────────────┐   ┌───────┴────────┐   ┌──────────────┐
│Bargaining Power│  │    Market      │  │Bargaining Power│
│ of Suppliers  │──│  Competitors   │──│  of Buyers    │
└──────────────┘   │                │   └──────────────┘
                   │  Rivalry among │
                   │ Existing Firms │
                   └───────┬────────┘
                           │
                    ┌──────┴───────┐
                    │  Threat of   │
                    │Substitute Products│
                    └──────────────┘
```
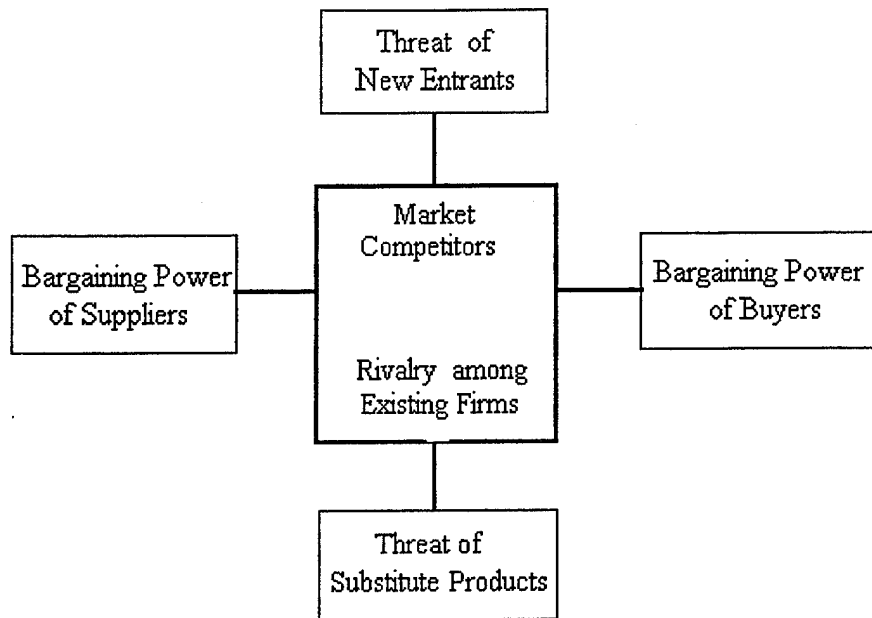
Figure 6. Porter Model

The strength of these forces are a function of the many characteristics of the buyers, including the buyers' risk at the sales price, which is a significant fraction of buyers' costs at the products' price. Co-production agreements, joint licensing arrangement, and offset requirement are often more important than price. For instance, with offset agreement between IPTN and Malaysia government, IPTN was able to sell CN-235 by agreeing to aid in the sale of Malaysian-made light aircraft trainers and cars.

d.   Threat of Substitute Products

Many substitutes for the commuter market exist and limit potential returns on prices, if IPTN should improve the products' price it should also improve the company's performance. Through professional management, eventually consumers are willing to pay

more for the higher quality. For example, after 1991 many American's aerospace business lost their market of up to 30 percent. However, the projections are that airline passenger travel over the next 20 years will increase 5.2 percent per year. Many American companies applied "lean manufacturing,"[58] adopted from MIT International Motor Vehicle Program, by reducing development, production cycle time and product defects.

Substitutes for commuters market segment are abundant, according to INTERAVIA's report, as of 1 March 1995 in the category 40-59 passenger, just 22 percent of the orders were delivered. In the category of 60-90 passenger, backlogs in delivery were 82 percent of the ordered aircraft.

e. Bargaining Power of Suppliers

Suppliers have a bargaining power over participants in industrial environment through price's threat, and reduction of the quality of goods or services. A threat to prices, if suppliers dominate the industry, for example, most of the N250 equipment is made in U.S.A.. Since IPTN is just a peripheral group in aircraft business, to lower costs it was necessary to plan to build an assembling plant in Mobile, Alabama. In other words in the industry IPTN is not an important customer of the supplier group. On the other hand, in IPTN calculation, decreasing in transportation and storage cost would lower its sales price.

IPTN's plan can be placed in a Gogel and Larreche matrix,[59] in relation with the allocation of strategic resources to the global marketplace as shown in Figure 7. Gogel and Larreche identify four types of competition in product strength and geographic coverage, which:

- Kings, have a strong competitive position. It is the ideal effective strategy.

- Barons, are equal with Kings but only in a regional area. Many other companies want to become its suppliers.

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[58]   *Aerospace America* (May 1995), p. 29.

[59]   Chris Phillips, et.al., *International Marketing Strategy*, (London: Routledge, 1994), p. 237.

- Crusaders, have the potential to become larger in the market, but its product is weak compared to the competition.

- Commoners, are typically a small company, weak in products and marketing, but locally strong under government protection.

Dependency of IPTN on foreign suppliers is high, because of scarcity of domestic suppliers. This condition makes it difficult for IPTN to compete in price on the international market.

	Barons	Kings
Product Strength	Commoners	Crusaders

Geographic Coverage
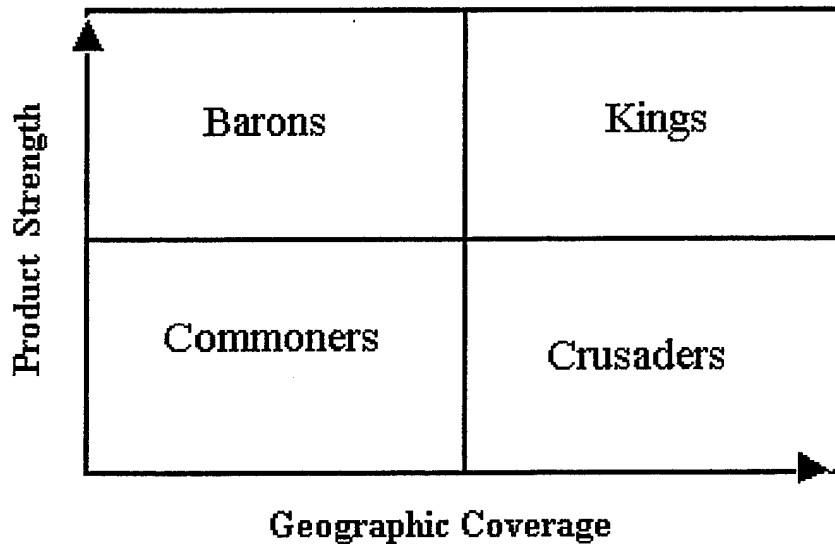
Figure 7. The International Competitive Posture Matrix
Source: Phillips, Chris et.al., International Marketing Strategy, p 237

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V. HYPOTHESIS TESTING IN TIME SERIES ANALYSIS

A.   GENERAL

To observe the relationship between IPTN spending since 1976 and government expenditures is a theoretical concept and is subjective, because of a lack of published data. The data for their observation of IPTN is a summary of investments from 1976 through 1994, and the IMF Reports on the Indonesian economy. Time series methods can be useful for an econometric model evaluation, precisely because they have been developed, at least in part, to deal with situations in which there is little information available.

The results are not considered to be based on actual performance, but an implication model. This model at least represents trends of a macroeconomic model.

B.   TIME SERIES ANALYSIS

Modeling the investment and consumption components in interaction with GDP is the focus of time series analysis. Based on the results, one can take into account both the direct and indirect effects of fiscal expenditure on the IPTN investment. The model is specified in the linear form as follow:

$$GDP = F, \tag{1}$$

where: F is private consumption, investment, export, import and government expenditures.

The private consumption variable is interesting, because it satisfies the major goal of any economic system. This variable may appear statistically significant and economically meaningful. In the macroeconomic model, the consumption function represents a number of hypotheses, such as, the absolute income, the relative income, the permanent income, the life cycle and the wealth hypotheses.

The investment variable as a domestic economy indicator of capital flow is a function of the change to domestic GDP. The foreign debt is assumed to depend on whether or not a country has access to international resources.

Export-import variable is assumed to depend on export prices relative to world prices, including non-oil, oil, and services. On the other hand both constrained and unconstrained imports are assumed to be determined by the external environment.

The government expenditure variable is important in the developing country like Indonesia, because the government role in economic life is dominant. Political stability will support economic growth, in turn the stability requires more employees for the public services.

The GDP variable is the most common indicator of annual economic growth. This device does not measure household production or leisure. This has been relatively constant for the last decade. GDP also ignores the CPI (consumer per index) bias, because the change of CPI per year would have a significant affect on living standards.

For the years 1976 through 1992 (Appendix A), it is assumed that the government expenditures includes a subsidy to IPTN as a state-owned company. The first significant test is using government expenditure data, adopted from the IMF report, as one of the independent variable. The second test, the government expenditure less the IPTN investment, is used as the independent variable.

For example, using IPTN investment, as a dependent variable, and the remaining as the independent variable, the Investment function for the model would be:

$$IPTN \ = \ a \ + \ b \ \times \ GDP \tag{2}$$

where a is a parameter that multiplies an implied variable, and has the value $= 1$, and b is coefficient of GDP the independent variable.

The first test, with government expenditure including the investment for IPTN with the R^2 (goodness of fit) is 0.9986 and Durbin-Watson Statistic (is one of the econometric test methods) is 1.9514 (Appendix B, OLS method) result are shown in Table 9.

Variable	Estimated Coefficient	t-statistic	Test
Private Consumption	117.401	18.416	Significant
Capital Investment	84.999	9.087	Significant
Export-Import	100.110	7.275	Significant
Government Expenditure	63.495	1.537	Not Significant
GDP	274.652	0.108	Not Significant

Table 9. Relationship Between Selected Variables and GDP, 1976 - 1992
Source: The OLSQ program of the TSP software based on the IMF Report, 1994

The variables with the most significant correlation to the GDP at a 95 percent confidence level (α =0.05) is private consumption, followed by capital investment and export. Data was then used to analyze the relationship between government expenditures and GDP and evaluate the tendency for government expenditures. The parameters were the long-run and the short-run marginal propensity to consume (MPC). Calculating uses OLS method, trends of government expenditure in relation to the GDP (Appendix D) are:

- In short-run, the trends is represented by 0.001

- In long-run represented by 0.0012

The second test, with government expenditures less the IPTN's investment, have similar results as the first test. Without a subsidy to IPTN, the estimation with R^2 is 0.9986, with a Durbin-Watson statistic of 1.9088. Results are shown in Table 10.

The result of short and long-run MPC of the government expenditure indicate similarity in number with the first test, because of the percentage of IPTN investment to the government expenditure is small.

Variable	Estimated Coefficient	t- statistic	Significant/Not Significant
Private Consumption	117.885	18.282	Significant
Capital Investment	86.725	9.183	Significant
Export-Import	101.856	7.270	Significant
Government Expenditure	59.348	1.416	Not Significant
GDP	-237.742	- 0.0924	Not Significant

Table 10. Relationships Between Selected Variables and GDP, Excluding the IPTN Investment, 1976-1992.
Source: The OLSQ program of the TSP software based on the IMF Report, 1994

Since the coefficient estimates of ordinary least squares are inefficient, and the standard error estimates are biased, the AR1 procedures is used. In this case, the Cochrane and Orcutt method[60] is used to estimate ρ from ordinary least squares residual. The process will be completed if it reached the maximum iteration (Appendix F). The result of recalculation showed:

- The government subsidy to the IPTN, government expenditure does not have a significant impact to the GDP.

- Similar statistics result with the assumption that government does not give the subsidy to IPTN

By using the fitted values of the dependent variable as a new time series without the residuals, through OLS method (Appendix G), showed similar trends as previous calculations.

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[60] *TSP User's Guide*, Version 4.2, (Palo Alto: TSP International, 1992), p. 38.

C.   CONCLUSION

A correlation analysis suggested that private consumption, capital investment, and export are the three most significant variables affecting the GDP (Appendix E) as an indicator of economic growth. It suggests that investment has an important dynamic effect on a national product, although growth may be considered a complicated process. On the other hand government expenditure is thought to be on a constant level. Expenditure may be directed toward education, employees, and government consumption. As Barro reported[61] that the larger the shares of government spending in total GDP, the lower growth and investment. He also found that government investment has no statistically significant effects to the GDP. Higher government spending with the effects of taxation increase, makes government expenditure rises but private consumption fall. In this hypothesis, a government may attempt to increase IPTN capital through government spending, but the calculation suggests it will have no effect on GDP.

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[61]   Gould,David M. And Ruffin, Roy J.,"What Determines Economic Growth?", *Economic Review*-Second Quarter 1993, Federal Reserve Bank of Dallas, p 34

VI. THE PROSPECT FOR THE FUTURE OF THE IPTN

A.   GENERAL

As shown in Chapter V, government investment has no statistically significant effect on economic growth. The statistics suggests that the governments attempt to increase economic growth through state-owned companies, including IPTN productivity, with government spending has no effect. The current Indonesian fiscal position can be characteristically as having a large external debt relative to the GDP. Foreign government debt is almost US$ 100 Million[62], with heavy servicing requirements.

As a state-owned company, IPTN has been protected from the market tests of profitability. The government has introduced many rules to protect its investment in IPTN since 1976. These rules require domestic airlines to use the IPTN products, although their operation costs are higher. If this policy continues, in the long run IPTN will find it increasingly difficult to compete in the global market. *Asian Defense Journal*[63] in an article, forecasted that in the commuter segment, more than 15 firms are sharing the market of US$ 100 Billion for some 8,000 aircraft to be manufactured during the next 20 years. This in light of some 20 types of aircraft proposed. Thus, many European and American companies are unwilling to see the development of manufacturing projects in Asia.

This chapter discusses some options for IPTN to effectively enter the international competition, where an environment is emerging that has an uncertain future.

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[62] *REPUBLIKA*, Internet http://www.republika.co.id/Ekonomi/Oktober, 1995

[63] *Asian Defence Journal*, No.6/95, p 59

B.   REDUCING DEPENDENCY TO THE GOVERNMENT

As written by Henry Bienen and John Waterbury[64], most state-owned companies are designed to meet one or more of the following objectives:

- Equity objectives: redistribution of income, job creation, and regional development.

- Infrastructure development.

- Collection of monopoly rents.

- Filling in for a deficient private sector.

- Taking over failed private enterprises.

- Countering monopolies.

- Nationalizing foreign enterprises.

- Strengthening economic sovereignty.

- Building national strength through the defense sector.

Government policy to develop IPTN started with taking over a small Air Force enterprise and an obsession to build national strength through the defense sector. After the oil boom in 1973, Indonesia received excessive return from its oil sales, as recorded by IMF. Table 11 shows oil exports as recorded by the IMF.

Suddenly, many people and groups wished to deviate from the National Development Planning Programs. IPTN was established, (sponsored by Pertamina, the state-owned oil company) for the purpose of job creation and regional development. At the time, Pertamina as a "Godfather", had an abundant supply money from an unanticipated increase in income. Later, mismanagement of Pertamina, financially mismanagement, resulted in the "Pertamina Crisis" in 1986. Support for IPTN was handed over to government through a restructuring

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[64]   Henry Bienen and John Waterbury, "The Political Economy of Privatization in Developing Countries," *World Development Journal*, Vol.17, No.5 (1989), pp. 617-632.

of IPTN's status. The Minister of Finance, acts as the government's shareholder in IPTN a state-owned enterprise.

Commodities (US$ M/Year)	1972	1973	1974	1975	1976
Crude Oil Products	913	1609	5211	5311	6004
Crude Oil	834	1383	4680	4933	5652
Crude Oil (Unit Value, '90=100)	12.7	17.3	53	58.2	59.0
Crude Oil (Ofc.Price, '90=100)	12.5	18	53.7	56.9	57.9
Oil (volume, '90=100)	64	85	151	148	169
Crude Oil ('90=100)	124	152	157	158	180
Foreign Exchange	533	753	1386	577	1492
Deposit Money Banks (Assets)	377	521	722	475	690
Liabilities	323	610	622	612	650

Table 11. Indonesia's Oil Exports, 1972 - 1976
Source: IMF, International Financial Statistics Yearbook, 1994, pp 420-422

Economically, IPTN grew under protection, both under Pertamina as a founder, or the government as the current owner. Both, despite their financial resources, do not have experience in the international aircraft business. IPTN's ambitious to produce its own aircraft, appears to be a political decision making rather than one based on economics. The evidence for this is that the N250 maiden flight was to commemorate 50 years' Indonesia's independence but marketing for the N250 is still a long way off[65].

Considering the aircraft business has a long-term return on investment. Eventually IPTN should export its product competitive in quality and at a competitive price, it should have a management that quickly responds to the market environment. This can be

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[65] *INTERAVIA*, (July/August 1995), p. 25.

implemented if the structure that is relatively small compared to typical government bureaucracy. Under government control, IPTN may have a high opportunity costs in the time for management make decisions for their complicated tasks. For example, Merpati Nusantara (one of the state-owned airline company) must buy 16 IPTN's (CN235) aircraft with a base price of US$ 13.5 million each, to help IPTN cash flow. Merpati refused the government requests, it claims that the IPTN-manufactured planes are expensive to operate and maintain. Operation cost of CN235 is high, US$ 110,000 per month compared with Boeing 737-200 which is US$ 105,000[66]. The airline's management also has objected to the financial conditions of the lease, arguing that the leasing charges are excessive and will only contribute to Merpati's continuing and current financial problem.

Consumers know the products' name through advertising, sales force, and other marketing strategies. Consumers usually seek a popular brand rather than sale price, benefits or other specifications. For IPTN, under a government subsidy, it is difficult to request a large portion of the budget for worldwide marketing. Although the board of director has the authority in finance policy, their priority is employees' wages and daily operation of IPTN. As discussed in Chapter V, the percentage that the government contribution to the GDP is very low. Distinction between First Model and Second Model showed a real difference in the statistical analyses. Thus, government expenditure including IPTN's investment, or government expenditure without IPTN's investment, does not significantly impact the GDP. This means government subsidies as investment in IPTN are relatively small in the development of aircraft manufacturer. Further, it could cause IPTN to be ineffective in its sales force and marketing efforts.

Reducing government intervention by deregulation of the company, in the long run, may be an attempt to strengthen the government fiscally, both through deficit reduction and

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[66] Internet http://www.republika.co.id/VIP/951024/24MNA.116.HTML

by bringing reality to IPTN economy activities. Diminishing government subsidies to state-owned enterprises, is essential to lower inflation, and to lure private and foreign investors.

C.   PREPARE TO INVITE CAPITAL INVESTMENT

IPTN is an Indonesian government asset, since 1976 the government has been invested totally about US$ 585.10 Million excluding land, manpower, and Air Force properties. The government and IPTN management should anticipate future trends. Basically, IPTN should determine what its attitude toward cooperation with interested capital investors is and who they are likely to be. Openness is needed by the appraising investor before an investment is made. This openness is difficult to implement in a domestic culture, such as Indonesia.

Porter wrote[67] in getting a general overview of company, the observer can obtain raw data about who is in the company, industry studies, and annual reports. But, he suggested, characteristics of structure and competitors can be found in raw data. They are the result of analysis of raw data. Most of the real data is gathered from field observations. To get more information, the observer usually makes contact with third parties, who interested in the company, but do not have a business relationship with the company. These parties are local press, unions, financial community, international organizations (e.g., FAA, IMF, World Bank). Third parties will give information more openly, recommend the best alternates, and identify key stakeholders who have a major role in the industry. Observers could compare the initial data with data from inside the company, for example, market research staff, sales force, service organization, former employees, engineering staff, purchasing department, and R&D department. Other information may come from Service Organizations for example, international trade associations, investment banks, consultants, auditors, commercial banks, and advertising agencies.

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[67]   Porter, *The Competitive Advantage of Nations*, pp. 371-379.

In the 1980s, developmental theorists suggested a "market-friendly"[68] approach to economic development. Their point is that the government in developing countries should reduce its interventions in domestic industries. The idea behind this approach is that domestic industries grow by properly following market law. For this to work the government must support it through a legal and regulatory framework.

Each company has its own characteristics, for IPTN, internationalization process is required to reach a break event point, although this will be done in a long term of at least 25 years. Chris Phillips[69] adopted Cavusgil and Nevin's chart (1981) of the international process as follows:

Process stage:	Critical activity:	External and internal determinant:
a. Domestic marketing	Solely in home market	Attitude barriers
b. Experimental involvement	An evaluation of the feasibility of exporting	Internal stimulus, unsolicited orders
c. Active involvement	Systematic exploration and planning	A willingness to make resources available
d. Committed involvement	Executes international marketing planning and marketing mix strategy	Long-term commitment to markets

Figure 8. The Internationalization Process of Company (from a to d)

So far, the IPTN attention are in the home market having a monopoly in commuter aircraft sales under government protections as its basic strategy. To rise to the next stages, IPTN should take into consideration critical processes and other determinants.

Openness in international flow of trade, investment, and technology eventually will support competitive domestic forces. Domestic companies should improve their production processes through efficiency to attract foreign investment. A competitive microeconomy will

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[68] Franklin R. Root, *International Trade and Investment*, Ch 20 (Cincinnati, Ohio: Southwestern, 1994), p. 547

[69] Phillips, et.al., International Marketing Strategy, p. 28.

gain from domestic and international trade if it is supported by a stable macroeconomic foundation.

D.   COMPANY FACTORS

All of all, the top executive's strategy is a key factor in developing international strategic planning of IPTN. Their commitment to improve the company image in the international market will color the IPTN performance. If they exploit their products for competitive advantage in a niche segment will this develop enough customer goodwill? The niche might be in a strong and concentrated market and requiring product knowledge, with direct competition in the areas of:[70]

- A prestige image, are the customers proud of IPTN's brand name.
- A price discounting given by IPTN offers an attractive service to the customer.
- A cheaper alternative among other competitors.
- Cost reduction in production, marketing, sales and after sales service.
- Product innovation by IPTN involving the customer.
- Improved IPTN services to the customer, by reducing communication constraints.
- Innovation in distribution system by building world wide supply network.
- Faster delivery, to reduces lead time of the on customer orders.
- Intensive advertising through mass media around the world based on strategic planning.
- Market development in domestic, regional, and international.

On the other hand, Phillips suggested[71] that before IPTN's executive decides to adopt an international marketing strategy, it is necessary for them to ask themselves about the total cost implications, the company brands, and the key factors for success in the industry. If

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[70]   Ibid. p. 242.

[71]   Ibid

there are many constraints, IPTN may focus on one of these various options. For example, IPTN may do the following: first, IPTN can play major markets by learning from other companies; second, by standardizing the IPTN's products could be the global cost leader; third, by performing higher activities in the value chain, such as R&D and manufacturing in other countries and fourth, by integrating with competitors, IPTN moves across countries through joint ventures.

VII. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

A.   SUMMARY

The following objectives were addressed in the discussion of this research:

- Determine the major contributors to the IPTN environment within the scope of this thesis.

- Develop a model that predicts the impact of IPTN's investment on the GDP within the scope of this thesis.

- Perform a time series analysis through OLS (Ordinary Least Squares) methods to determine the affect of IPTN's investment on the GDP rate.

The discussions addressed within the scope of IPTN's investment and macroeconomics aspects, *ceteris paribus*. Private consumptions, capital investment, exports, imports, and government expenditure were used as independent variables in relation to GDP, with dependent variables used to define the impact of IPTN's investment as a small portion of government expenditure on the GDP. The thesis observation uses for IPTN's investment the data obtained from the manufacturer's publication. The IPTN's investment was selected, because of IPTN's status as the state-owned company, which is assumed that its budget is part of government expenditure.

A description of how the government's economical background as the owner of IPTN was given in Chapter II. Chapter III discussed the IPTN's as it exists, including its organization, long-term planning, current production. Chapter IV presented the general environment of IPTN. It noted that the most important stakeholder is one man who holds multiple functions. This chapter also discussed the position IPTN has among aircraft manufacturers as competitors. The results of the hypothesis testing in time series analysis and evaluation were presented in Chapter V. The last discussion, Chapter VI attempted to offer to IPTN some options for entering effectively into international competition.

B. CONCLUSIONS

The following conclusions were reach in this thesis:

IPTN's investment as a part of government expenditure does not have a significant impact on economical growth, measured by GDP. This subsidy it is predicted will be given as long as IPTN's sales are below the break even points.

Based on the IPTN's history and organization structure, IPTN was created not to compete in the world market, but to accustom Indonesian workers to high technology manufacturing. Yet, economically, IPTN is an expensive "toy" for the Indonesian government. The manufacturing infrastructure has not grown as a result of the governments support of IPTN.

The models were typical econometrics, they are based on and through necessity on incomplete data. The result is a trend for IPTN in the future. *Ceteris paribus.* However the factors affecting IPTN may vary. For example, if government were to follow a strategy to improve the IPTN performance in view of economic realities.

The top executive strategy is the key factor in developing an international strategic planning of IPTN.

C. RECOMMENDATIONS

The following recommendations are made as a result of the analysis of this thesis:

The Indonesia's government has invested billions of US dollars in IPTN. Now it needs to develop strategic planning to make IPTN's products more marketable.

To make IPTN more liberal, the Indonesian government should share the risk with foreign and private investors. More investment IPTN is needed to enlarge the marketing and sales its products.

IPTN should focus on a niche market with its specific products or regional markets. This would allow company to grow gradually in increasing strength.

This study should be continued to place IPTN among its worldwide competitors in the future. IPTN is one of the projects of which the Indonesian people's are proud, they would continue to support IPTN if it were able to grow as a well-managed company. Finally, management improvements in the state-owned companies such as IPTN, would reduce dissipation of capital.

APPENDIX A. SELECTED NATIONAL ACCOUNTS AND IPTN's INVESTMENT (In US$ Million)

YEAR	GDP	PRIVATE CONS.	CAPITAL INVEST.	EXPORT	IMPORT	GVT EXPEN.	GDP DEFL	IPTN INVS
1976	201669.9	25214.46	7722.89	8265.06	-7763.86	3833.74	18.5	18.4
1977	219339.8	30019.28	9219.28	10761.45	-9197.59	5004.82	20.9	4.60
1978	157060.8	22160.00	7473.60	7896.00	-5392.00	4254.40	23.2	6.90
1979	166354.1	31122.81	10692.19	15357.26	-12049.4	5953.75	30.7	1.30
1980	182847.8	43878.43	15132.42	22094.77	-16081.7	7479.26	39.7	20.8
1981	192071.4	50144.41	26900.62	25119.57	-21923.9	10018.6	47.0	43.6
1982	182632.5	54763.90	25135.02	21809.39	-21929.2	10540.1	49.4	77.4
1983	132571.4	47347.08	22395.37	19966.80	-19744.5	8125.76	58.9	24.4
1984	131254.2	50341.71	21920.86	21414.34	-18477.7	8493.48	63.8	58.8
1985	128390.2	50845.33	24181.33	19141.33	-17631.1	9682.67	67.2	29.9
1986	93190.13	38607.56	17687.39	12193.78	-12819.0	6903.72	67.1	57.4
1987	97247.27	43629.70	23724.85	18105.45	-16943.0	7129.70	77.8	86.6
1988	98054.3	46819.76	25886.77	20026.57	-18007.5	7369.15	86.7	37.9
1989	101496.4	49388.98	32738.45	23653.31	-21480.8	8735.67	91.7	28.0
1990	102891.6	55924.25	37193.58	27329.30	-26799.6	9244.08	100	47.9
1991	104964.9	62822.79	39749.00	31257.03	-30811.2	10434.2	108.1	16.72
1992	107776.9	65981.57	43077.11	36407.37	-33062.1	11993.7	115.4	24.48

Source: a. International Financial Statistics Yearbook 1994, IMF, Washington DC, 1994
  b. Company Profile, Roll Out N250, IPTN, 1994

APPENDIX B. METHOD OF ESTIMATION = ORDINARY LEAST SQUARES

Assumption: Government Expenditure is including IPTN's investment

Dependent variable: GDP
Current sample: 1976 to 1992
Number of observations: 17

Mean of dependent variable	=	141208.
Std dev. of dependent variable	=	42224.8
Sum of squared residuals	=	.389531E+08
Variance of residuals	=	.324609E+07
Std. Error of regression	=	1801.69
R-squared	=	.998635
Adjusted R-squared	=	.998179
Durbin-Watson statistic	=	1.95143
F-statistic(zero slopes)	=	2194.03
Schwarz Bayes Info.Crit.	=	15.4780
Log of likelihood function	=	- 148.602

Variable	Estimated Coef.	Std Error	t-statistics
C	274.652	2541.39	.108072
PCONSP	117.401	6.37510	18.4155
INVESTP	84.9990	9.35371	9.08720
GOVEXPP	63.4946	41.3105	1.53701
NETRADEP	100.110	13.7617	7.27453

Dependent variable:GDP
Current sample: 1976 to 1992
Number of observations: 17

Mean of dependent variable	=	141208.
Std. Dev. of Dependent var.	=	42224.8
Sum of squared residuals	=	.119075E+10
Variance of residuals	=	.793832E+08
Std.Error of regression	=	8909.73
R-squared	=	.958259
Adjusted R-squared	=	.955476
Durbin-Watson statistic	=	1.31736
F-statistic(zero slopes)	=	344.358
Schwarz Bayes. Info.Crit.	=	18.3980
Log of likelihood function	=	-177.671

Variable	Estimated Coef.	Std Error	t-statistics
C	22760.0	6738.83	3.37744
GOVEXPP	819.065	44.1381	18. 5569

APPENDIX C. METHOD OF ESTIMATION = ORDINARY LEAST SQUARES

Assumption: Government Expenditure is not including IPTN's investment

Dependent variable: GDP
Current sample: 1976 to 1992
Number of observations: 17

Mean of dependent variable	=	141166.
Std dev. of dependent var.	=	42275.6
Sum of squared residuals	=	.398176E+08
Variance of residuals	=	.331813E+07
Std.Error of regression	=	1821.57
R-squared	=	.998608
Adjusted R-squared	=	.998143
Durbin-Watson statistic	=	1.90884
F-statistic(zero slopes)	=	2151.49
Schwarz Bayes Info.Crit.	=	15.4999
Log of likelihood function	=	-148.788

Variable	Estimated Coef.	Std Error	t-statistic
C	-237.742	2570.86	-.092476
PCONSP	117.885	6.44814	18.2820
INVESTP	86.7246	9.44411	9.18294
GOVEXPP	59.3479	41.9251	1.41557
NETTADEP	101.8656	14.0102	7.27011

Dependent variable: GDP
Current sample: 1976 to 1992
Number of observations: 17

Mean of dependent variable	=	141166.
Std. Dev. of dependent var.	=	42275.6
Sum of squared residuals	=	.120051E+10
Variance of residuals	=	.800338E+08
Std.Error of regression	=	8946.16
R-squared	=	.958018
Adjusted R-squared	=	.955219
Durbin-Watson statistic	=	1.32518
F-statistic(zero slopes)	=	342.294
Schwarz Bayes. Info.Crit.	=	-177.741

Variable	Estimated Coef.	Std Error	t-statistic
C	22891.0	6750.99	3.39076
GOVEXPP	821.105	44.3821	18.5012

APPENDIX D. THE SHORT- AND LONG-RUN ESTIMATES OF THE GOVERNMENT EXPENDITURE IN RELATION WITH GDP

Source: Looney, Robert E., A Development Strategy for Iran through the 1980s
Praeger Publishers, NY,1977, pp 169-171

From the ordinary least square:

$$C_t^{P^*} = a + bY_t \tag{3}$$

$$C_t^P = xa + xbY_t + (1-x)C_{t-1}^P \tag{4}$$

$$GVEXPP = -27.66 + 0.001Y_t + 0.169C_{t-1}^P; r^2 = 0.977 \tag{5}$$

$$(C_t^P - C_{t-1}) = (C_t^{P^*} - C_{t-1}^P) \tag{6}$$

Assumed government expenditure is including investment in IPTN,where t-statistic is 12.08 and 2.45, then :

$$x = -27.66xb = 0.0011 - x = 0.169$$

$$r^2 = 0.977 \tag{7}$$

Key parameters for Government expenditure are, x = 0.831
xb = 0.001 (tends in Short-run)
b = 0.0012 (tends in Long-run)

From OLSQ program, if government expenditure is not including investment in IPTN, so:

$$GVEXPP = -27.75 + 0.001Y_t + 0.171C_{t-1}^P \tag{8}$$

$$r^2 = 0.977 \tag{9}$$

With t-statistic (12.13) and (2.49), key parameters for Government expenditure are:
x = 0.829
xb = 0.001(tends in Short-run)
b = 0.0012(tends in Long-run)

APPENDIX E. ADJUSTMENT MODEL FOR DEVELOPING COUNTRIES

Source: Kumar, Manmohan S Et.Al., An Extended Scenario and Forecast Adjustment Model for Developing Countries, Staff Studies for the World Economic Outlook, IMF, Washington DC, December 1993, pp 47-73.

A. GOVERNMENT EXPENDITURE

In most of developing countries, the total of government spending is around 30 to 40 percent of GDP. The capital expenditure is being used as one of a government policy instrument. A greater short-run increases in government expenditure because of a rise in the price level than increase in revenue. Long-run elasticities in relation with GDP, import, and export are around 0.5, 0.25, and 0.25 respectively. In according to the government's balance budget, the expenditure is

$$GB = GR - (GC+GK)$$

where

        GB   - government budget

        GR   - government revenue

        GC   - current government expenditure

        GK   - current government capital expenditure

B. EXTERNAL SECTOR

Exports are defined as non-oil, oil, and nonfactor services exports. Demand of export is depending on world price, and supply is depending on domestic price. Exports of nonfactor services, such as tourism and banking are depending on the level of dollar GDP.

Imports are determined by unconstrained and constrained imports, which defined as:

Unconstrained imports = F(Import prices/domestic prices, expenditure on home goods, lagged reserves to import ratio, real export earnings)

Constrained imports = Total export receipts + Net transfer receipts + Net investment income receipts + Net capital inflows - Accumulation of international reserves.

C.   INVESTMENT

Investment is divided into three categories, total investment income credits, direct investment income debits, and other investment income debits. Especially for investment income credits depend on s country's stock of foreign assets which are recorded by LIBOR(the London interbank offered rates) on six-month dollar deposits.

Total investment income credits = F(LIBOR*International reserves)
Direct investment income debits = F(Domestic GNP in dollars)
Other investment income debits = F(Debt-service payments)

APPENDIX F. COCHRANE-ORCUTT ITERATIVE TECHNIQUE TESTS

Assumed the Government Expenditure Including Investment to IPTN

Private Consumption = F(GDP), R-squared = 0.9761, D-B Statistic = 1.72024

Variable	Estimated Coeff.	Standard Error	t-statistic
Intercept	-68.9594	49.904	-1.570
GDP	.00622	.000311	19.99

Government Expenditure = F(GDP), R-squared = 0.954192, D-B Statistic = 1.96743

Variable	Estimated Coeff.	Standard Error	t-statistic
Intercept	-26.0116	10.1386	- 2.5656
GDP	0.00122	0.00007146	17.0771

Capital Investment = F(GDP), R-squared = 0.578495, D-B Statistic = 2.44895

Variable	Estimated Coeff.	Standard Error	t-statistic
Intercept	74.0447	81.5876	0.907548
GDP	0.00242567	0.0005533	4.38341

Assumed the Government Expenditure Does Not Include IPTN's Investment

Private Consumption = F(GDP), R-squared = 0.965221, D-B statistic = 2.15622

Variable	Estimated Coeff.	Standard Error	t-statistic
Intercept	-66.7675	44.4250	-1.50293
GDP	0.006212	0.0003151	19.7115

APPENDIX G. OLS TESTS USING THE SCALED CHANGED IN FIT

Assumed the Government Expenditure Including Investment to IPTN

Government Expenditure = F(Export), R-squared = 0.957745, D-B statistic = 1.31609

Variable	Estimated Coeff.	Standard Error	t-statistic
Intercept	65.239	5.00014	13.046
Export	1.99133	0.107997	18.4387

IPTN investment = F(Gov. Expenditure), R-squared = 0.024205, D-B statistic = 1.53698

Variable	Estimated Coeff.	Standard Error	t-statistic
Intercept	140.459	7.17425	19.5783
Gov. Expenditure	0.028726	0.047092	0.609986

Variable	Estimated Coeff.	Standard Error	t-statistic
Intercept	0.415747	0.254032	1.6366
IPTN Investment	0.0010695	0.00175335	0.609986

Assumed the Government Expenditure Does Not Include IPTN's Investment

Government Expenditure = F(Export), R -squared = 0.958018, D-B statistic = 1.32518

GDP = F(IPTN Investment), R-squared = 0.024205, D-B statistic = 0.310072

Variable	Estimated Coeff.	Standard Error	t-statistic
Intercept	65.2432	4.95472	13.1679
Export	1.97673	0.106843	18.5012

GDP = F(Government Expenditure), R-squared = 0.958018, D-B statistic = 1.32518

Variable	Estimated Coeff.	Standard Error	t-statistic
Intercept	222890.9	6750.97	3.39075
Gov.Expenditure	821.106	44.381	18.5012

IPTN Investment = F(GDP), R-squared = 0.309851, D-B statistic = 1.09120

Variable	Estimated Coeff.	Standard Error	t-statistic
Intercept	1.24644	0.261981	4.75776
GDP	-1.18516	0.456694	-2.59508

IPTN Investment = F(Export), R-squared = 0.304027, D-B statistic = 1.19359

Variable	Estimated Coeff.	Standard Error	t-statistic
Intercept	0.690529	0.054587	12.6502
Export	-0.003013	0.001177	-2.5598

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