

Do 5-year plans do any good: Evidence from Thailand 1979-2010

Wannipa Promprasert^a, Patcha Chaikitmongkol^a and Peter Calkins^a

^a Faculty of Economics, Chiang Mai University, Chiang Mai, Thailand

1. Introduction

The use of five year plans in the macroeconomic management of growth and development is not new. Such planning goes back to Joseph Stalin's first five-year plan of 1928-33 in the Soviet Union; was subsequently used by China, Albania, Cuba and the Eastern European satellite nations; and was finally adopted by the economically underdeveloped nations as they achieved independence from colonial powers in the period from the mid-1940s through the early 1960s. The implicit assumption in the use of plans is that they help to a) allocate resources to unblock the chief sectors of development, b) channel capital to its most productive uses, c) assure that there are no shortfalls in the supply of key intermediate and final goods, d) re-orient the economy towards the export of products in which it has either a comparative or strategic advantage, e) inform economic decision-makers at the micro-level where the economy is headed (this may also be accomplished by French indicative planning), and f) help to reduce unemployment, environmental destruction and other problems of market failure.

But today's economies are far different than the Soviet Union of the 1930s. Markets exist, allocation can no longer be made by fiat, and planners and their citizenry care about the destruction of the environment and the lives of workers. Market expansion and ever-widening globalization mean that even the best-laid plans may be buffeted at short notice by international financial crises, jumps in the prices of key inputs like petroleum, production short-falls in far-off countries, and growing or waning confidence in stock or asset markets. The more one plans, the less

perfect one's foresight is likely to become, and the more one restricts flexibility in dealing with the above issues. It could therefore be hypothesized that plans actually lower the growth rate and increase the upward and downward swings of the business cycle. Since none of the OECD economies use five-year plans, why should the underdeveloped economies be expected to use them?

Even if plans are adopted, several theoretical questions must first be answered. First of all, how soon before the end of the current five-year plan should the subsequent plan be revealed? What is the lag time between knowledge of the plan and its implementation? Will rational and adaptive expectations undo the plan, or help it better to succeed, with such forewarning? What correctives, if any, should be used during the course of plan implementation itself, and how can they be most effectively announced? What is the minimal time that a government should remain in office (or is expected) for the plan to be given a fair chance at succeeding? If government itself or government policy changes rapidly, can any conclusions be drawn about the internal validity of the original plan? Should plans be decided and administered top-down (from the central government in the capital city) or bottom-up, through an inductive aggregation of township and provincial plans? In sum, does using plans introduce an inevitable cobweb cycle into macroeconomic planning which may just as easily intensify as mitigate business cycles and volatility? Are plans which target growth and efficiency more likely to succeed than those that target equity and equilibrium. Are such strategies of export-led growth and FDI attraction more

likely to show success than domestic demand led growth and shifts of resources out of agriculture? Only if these questions can be carefully answered can an objective analysis of planning as a process be realized.

Thailand provides an informative case study of all of these questions. In the period 1979-2010, governments have changed 13 times, for an average policy period of only 2.4 years. This contrasts with the heyday of success in Indonesia macro-management (1966-1996) when Suharto and virtually the same set of ministers were able to guide the economy in the same direction with consistent policies for a full 30 years. In its most recent 5-year plan (2007-2011), Thailand has even resorted to bottom-up planning, encouraging each district, township, and province to formulate 3- and 5-year plans may then (at least theoretically) be integrated and synthesized into the overall national plan. At the same time, each level of government is expected to integrate into those plans the spirit of moderation, self-immunization, reasonableness, knowledge, ethics and balance promoted by the King of Thailand's sufficiency economic philosophy.

Thailand's experience with plans has also been punctuated by political turmoil. The middle class uprising in 1992, the protest of the yellow shirt in 2008 have been followed by the red shirt and government violent fighting in 2010 in which 88 people were reportedly killed (*VoiceTV*, 25 May 2010) and the lucrative tourist industry of Thailand lost an estimation of 2.9 billion dollars in revenue according to American Free Press (AFP). The 1997-98 Asian financial crisis began in Thailand, and there have been large, relatively unexpected financial crises since in 2004 and 2008, the latter emanating from the collapse of the housing economy in the United States.

Under such political and economic volatility and unpredictability, what can be said about the usefulness and effectiveness of Thailand's five-year plans? In the absence of a counterfactual, which components of past plans seem to have made them more successful in achieving sustained growth and

moderate swings in the business cycle? Our reasoning in this paper will have to be *a fortiori* in nature. In other words, the ideal policies we identify will have to have succeeded even in the presence of financial or political shocks. If not, we will be forced to conclude that there is no evidence that five-year plans do much good in keeping the economy on a high, steady ascendant; or in keeping inflation down, employment and the three gaps (savings-investment, government revenues – government expenditures, and foreign receipts – foreign expenditures) positive.

The overall goal of this study is to investigate and inter-relate Thailand's economic growth patterns, the successive themes and content of the country's economic development plans, and the timing of alternative exogenous and endogenous determinants of growth. The temporal scope of this study is during 1979-2008, based on the availability of comparable data.

2. The factors of Thailand's economic growth

2.1. Review of the literature on the economic growth of Thailand and Developing Asians

2.1.1 Trade liberalization and openness

Diao *et al.* (2005) examined the inter-temporal general equilibrium of international spillovers, productivity growth and openness in Thailand, with particular attention to interaction between productivity and investment in an inter-temporal growth model. Sources of high growth in Thailand have been its prolonged transition path, its gradual reduction in tariffs, and endogenous productivity increases driven by foreign spillovers feeding capital investment. Counterfactual analyses show how growth would be reduced, with a slowdown productivity and investment, if trade protection were re-imposed. On the other hand, growth with faster convergence to a steady state would occur if there under full and sudden ("shock-therapy") liberalization.

Diao *et al.* (2006) further conclude that Thailand's continued growth has been based on learning by exporting, labor-intensive manufacturing, and expanding domestic backward linkages. The Ramsey model shows that such growth is explained by both the learning mechanism and a structural shift from agriculture to exportables. A counterfactual experiment was employed to study the relationship between exports and productivity. The chief barrier to learning through exports was barriers to trade. In summary, Thailand's main growth factors

have been trade openness and structural change.

2.1.2 Structural change and infrastructure development

The same authors (Diao *et al.* 2006) then applied the Ramsey growth model to Thailand. They confirmed that --in contrast to modern growth theory -- technology and human capital are the key ingredients of sustained growth, particularly in the presence of openness to trade; but that periods of high growth are temporary.

Table 1: Summary of possible key factors of Thailand's economic growth as found in the literature

Thailand's key growth factors	Conclusion from the studies of
Trade openness <ul style="list-style-type: none"> • Gradual tariff reduction 	<ul style="list-style-type: none"> • Diao, Rattso and Stokke (2006) • Diao, Rattso and Stokke (2005)
Structural change <ul style="list-style-type: none"> • Reallocation of resources away from agricultural sector to industry and service sectors 	<ul style="list-style-type: none"> • Diao, Rattso and Stokke (2006) • Peter Warr (2006)
Foreign direct investment	<ul style="list-style-type: none"> • Chowdhury and Mavrotas (2006) • Diao, Rattso and Stokke (2005)
Capital accumulation	<ul style="list-style-type: none"> • Chuenchoksan and Nakornthab (2008)
Domestic demand-led strategy	<ul style="list-style-type: none"> • Felipe (2003)
Export-led strategy <ul style="list-style-type: none"> • A slowing of agricultural growth • A development in manufacturing sector • A skilled and well-trained labor force • Adequate infrastructures • Reasonable valued exchange rate • Responsible fiscal and monetary policies 	<ul style="list-style-type: none"> • Akrasanee, Dapice and Flatters (1991) • Felipe (2003)

2.1.3 FDI and capital accumulation

Chowdhury and Mavrotas (2006) added to these variables the importance of foreign direct investment (FDI). Applying the Toda-Yamamoto test to trade causality on data from Chile, Malaysia, and Thailand—major recipients of FDI during 1969-2000 – they established bi-directional causality between FDI and economic growth for Thailand.

Within a labour-market perspective, FDI should be focused in key, high-productivity sectors in order for the country to sustain a high growth path (Chuenchoksan and Nakornthab 2008). To identify which sectors those might be, Warr (2006) employed data from Thailand and Indonesia over the period 1981 to 2002 to measure the contribution to economic growth from productivity improvements in the agricultural, industrial, and service sectors. Decomposing total factor productivity growth into individual sectors' productivity growth and the reallocation of resources from low productivity to high productivity sectors, Warr found that sector-level factor productivity growth derives from agriculture. However, the reallocation of resources away from agriculture is a much larger source of aggregate productivity growth.

2.1.4 Export led vs. domestic demand-led strategies

Much earlier, Akrasanee *et al.* (1991) had rejected the hypothesis that Thailand's success in export-led growth was attributable to growth in world demand and foreign direct investment. Rather, most of Thai growth in market share on the world export market had resulted from Thailand's evolving comparative advantage, which two conditions specific conditions had made possible. The first condition was favorable domestic economic circumstances: a slowing of agricultural growth, development in the manufacturing sector, a skilled and well-trained labor force, and adequate infrastructures. The second condition was responsive macroeconomic management,

notably a reasonably-valued exchange rate, and responsible fiscal and monetary policies.

Twelve years later, Felipe (2003) re-examined the export-led growth (ELG) strategy in comparison with domestic demand-led growth (DDLG) for Asian countries as a whole. Export-led growth yielded success in some Asian countries, but according to some suffered from a fallacy of composition and should be replaced by demand-led growth. Felipe argued that most developing Asian countries need ELG to achieve economies of scale through upgrading. In the end, a country should achieve a combination of ELG and DDLG.

3. Introduction to Thailand's growth pattern, and the national economic and social development plan (NESDP)

3.1 History of Thailand's economic growth and NESDP

Over the past three decades the Thai economy has grown five-fold. The country's real gross domestic product (GDP) has increased from 873 billion Baht in 1979 to 4,361 billion Baht in 2008. During that period the average annual growth rate has been 5.5%, a very respectable long-term growth rate even within exceptional Asia.

What has caused this successful growth? One possible answer may lie in the National Economic and Social Development Plans (NESDPs) that have been implemented since 1961 by the National Economic and Social Development Board (NESDB), a major planning and supervisor organ of the country's government. Each NESDP is used for five consecutive years. During 1979-2008, seven five year plans (NESDP 4 through NESDP 10) have been put into operation. Figure 1 shows the average annual growth rate of Thailand's economic growth—represented by real gross domestic product (real GDP) in each NESDP period. The growth rates vary from as high as 8.9% per annum during NESDP 6 (1986-1991) to as low as 0.01% per annum during NESDP 8 (1996-2001). Over 1979-2008, there have been two structural shocks, both of them

financial crises. The first one was the 1997 Asian Financial Crisis, also known as the Tom-Yum-Kung Crisis since it started in Thailand before spreading to parts of Asia. According to Figure 1, during the crisis, there was a large unusual fluctuation of real GDP. Consequently, the period of NESDP 6 (1996-2001) has merely no economic growth on average. The second crisis was 2008 U.S. financial crisis. The crisis has been a much bigger catastrophe than the Asian crisis. It has caused global recession prolonged until today. With this crisis, Figure 1 shows that the average annual growth rate of real GDP during NESDP 10 (2007-2008) was only 1.2%. Notice that the country had done much better—in the sense that it can still maintain positive economic growth rate—in this second crisis than in the first crisis.

The present study will attempt to test five simple hypotheses:

1. Plans with outward expansion and a balance between growth and equity have the highest growth rates.

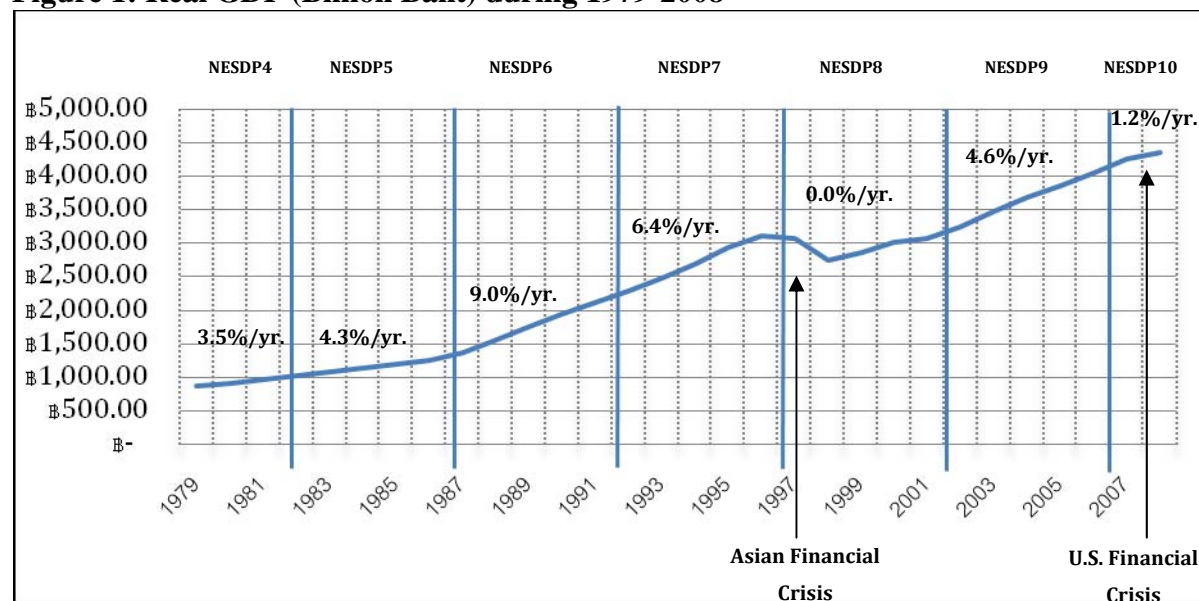
2. Periods of high growth have had plans with very different weightings of the four development principles: efficiency, equity, equilibrium, and evolution.

3. Plans in those periods of high growth have also had widely varying targets (economic growth, society, environment, human capital, science and technology, and administration).

4. Within each plan there is a dip in growth in year 1 and a steady rise in goal achievement in years 2 through 5. (Rejection of this hypothesis would imply that the economy takes no notice of the plan.)

5. Foreign direct investment is strongly correlated with growth but remains out of the control of Thai macroeconomic decision-makers.

Figure 1: Real GDP (Billion Baht) during 1979-2008



Note: Real GDP is GDP at constant 1988 prices. Annual growth rate = $-1 + (\text{Value of ending year} / \text{Value of starting year})^{(1/\text{No. of years})}$

Source: GDP at constant 1988 prices is from Bank of Thailand

3.2 National economic growth targeting

Even though Thailand seems to have grown well in real terms, do these growth rates match the expectations of NESDB in each NESDP? In other words, does the economic performance in each period response to

policies as well as the planners expect? According to Table 1, starting from NESDP 4, the economic growth target of 7.2% had not been met with the actual growth rate. The gap was negative 3.7%. In NESDP 5, the target was revised downward to 6.6%. However,

despite higher growth of 4.3% per year, there was a negative gap in expected growth of 2.3. Therefore, in NESDP 6 the target was lowered still further, to 5%. Surprisingly, the actual rate was 8.9%, resulting in the highest positive gap of all the 7 periods. This led to re-establishing a high target of 8.4% in the following plan (NESDP 7). Nevertheless, the actual growth declined to 6.4% per annum, still quite respectable and equal to the target of plan 5. In NESDP 8, the target remained high at 8.0%. Unfortunately, the Tom-Yum-Kung crisis occurred at the beginning of the period, leading to stagnation at an average of 0% economic growth per annum. In NESDP 9, the

target was set at 4.5%. This was met by the actual economic growth of 4.6%. Following on all of these over- and undershoots, NESDP 10 aims at 5% growth rate. So far, with the U.S. financial crisis, during 2007-2008, the growth rate was only 1.2%. In order for the target to be met, the average growth rate during 2009-2011 needs to be as high as 7.5% per annum, an implausible rate in the slow world economy.

In summary, except for the large gaps in the periods affected by structural shocks, the Thai economy has been doing quite well comparing to the economic target.

Table 2: NESDB's target growth rate and Thailand's actual growth rate.

NESDP	Years	Target growth rate	Actual growth rate	Gap
4	1979-1981	7.2%	3.5%	-3.7%
5	1982-1986	6.6%	4.3%	-2.3%
6	1987-1991	5.0%	8.9%	+3.9%
7	1992-1996	8.4%	6.4%	-2.0%
8*	1997-2001	8.0%	0.0%*	-8.0%*
9	2002-2006	4.5%	4.6%	+0.1%
10*	2007-2008	5.0%	1.2%*	-3.8%*

Note: * denotes that the period faced structural shocks.

Computation: Annual growth rate = $-1 + (\text{Value of ending year}/\text{Value of starting year})^{(1/\text{No. of years})}$

Source: The data on target growth rate are from the National Economic and Social Development Board.

3.3 The emphases of NESDPs

Each of the national economic and social development plans (NESDP) has had a unique set of emphases, so the question naturally arises, which emphases seem to be consistently associated with high growth? Table 3 shows the emphases in each plan categorized by

1) efficiency, equity, equilibrium, and evolution or the "4 e's" in the economy (Calkins 2008).

2) six components in the economy — economic activities *per se*, society, environment, human capital, science and technology, and administration.

The table also summarizes the share of focus in each of the 4 e's of each NESDP. Table 4 summarizes the share focus in each of the six components in each NESDP, as well as the main foci (e's) and components in each

period; and compares them to the average annual real GDP growth rate per annum. In the table, the periods with real GDP annual growth above the average of 1979-2008, 5.5% are shaded.

Table 5 shows that the periods of NESDP 6 and 7—with average annual growth rates of 8.9% and 6.4% respectively—share a focus of efficiency and economy. The periods which focus only on economy but not on efficiency—NESDP 5 and 9—also have relatively high growth. However, the periods that focus on efficiency but not on economy—NESDP 8 and 10 do not have high economic growth.

Therefore, the conclusion in this part of the study is that a balanced focus on both efficiency and economy results in the highest economic growth. Focus on economy without efficiency result in high growth but relatively less than the ones in the first group.

Table 3: Emphases of National Economic and Social Development Plans (NESDPs) during 1979-2008

			NESDP 4 (1977-1981)	NESDP 5 (1982-1986)	NESDP 6 (1987-1991)	NESDP 7 (1992-1996)	NESDP 8 (1997-2001)	NESDP 9 (2002-2006)	NESDP 10 (2007-2011)
Efficiency	<i>Society</i>	<ul style="list-style-type: none"> • quality of population • infrastructure • value-added from local wisdom 			X		X		X
	<i>Environment</i>	<ul style="list-style-type: none"> • natural resources development 	X		X	X	X		X
	<i>Human Capital</i>	<ul style="list-style-type: none"> • improve human capital 	X		X	X	X		
	<i>Economy</i>	<ul style="list-style-type: none"> • economic efficiency • production system • quality of basic economic factors 		X	X			X	
	<i>Science and Technology</i>	<ul style="list-style-type: none"> • science and technology development 			X				X
	<i>Administration</i>	<ul style="list-style-type: none"> • public administration system • good governance 					X	X	
Focus on efficiency (% of total focuses)			25%	17%	60%	40%	57%	29%	50%
Equity	<i>Society</i>	<ul style="list-style-type: none"> • social security and social services • prosperity in rural area 		X	X				
	<i>Human Capital</i>	<ul style="list-style-type: none"> • quality of life • empower Thais • family size 				X	X	X	X
	<i>Economy</i>	<ul style="list-style-type: none"> • redistribute income • sufficiency economy 	X	X	X	X		X	X
Focus on equity (% of total focuses)			12.5%	33%	20%	40%	14%	42%	33%
Equilibrium	<i>Society</i>	<ul style="list-style-type: none"> • stable society 			X		X		
	<i>Environment</i>	<ul style="list-style-type: none"> • balanced natural environment 							X
	<i>Human Capital</i>	<ul style="list-style-type: none"> • employment level • balanced demographic structure 	X					X	
	<i>Economy</i>	<ul style="list-style-type: none"> • sustainable growth rate 			X	X	X	X	
Focus on equilibrium (% of total focuses)			12.5%		20%	20%	29%	29%	17%
Evolution	<i>Environment</i>	<ul style="list-style-type: none"> • rehabilitate environmental conditions 	X						
	<i>Human Capital</i>	<ul style="list-style-type: none"> • reduce population growth 	X						
	<i>Economy</i>	<ul style="list-style-type: none"> • economic and financial recovery • adjust economic structure 	X	X					
	<i>Administration</i>	<ul style="list-style-type: none"> • strengthen national security • reform national administration system 	X	X					
Focus on evolution (% of total focuses)			50%	50%					

Source: of the information in the two columns above: NESDB

Table 4: Share of emphasis on each category of development for NESDP 4-10

	NESDP 4 (1977-1981)	NESDP 5 (1982-1986)	NESDP 6 (1987-1991)	NESDP 7 (1992-1996)	NESDP 8 (1997-2001)	NESDP 9 (2002-2006)	NESDP 10 (2007-2011)
Focus on society (% of total focuses)		17%	30%		29%		17%
Focus on environment (% of total focuses)	25%		10%	20%	14%		32%
Focus on human capital (% of total focuses)	38%		10%	40%	29%	43%	17%
Focus on economy (% of total focuses)	25%	66%	40%	40%	14%	43%	17%
Focus on science and technology (% of total focuses)			10%				17%
Focus on administration (% of total focuses)	12%	17%			14%	14%	
Total	100%	100%	100%	100%	100%	100%	100%

Note: the analysis give each focus on each NESDP same weight.

Table 5: Foci of each NESDP on the 4 e's and the six components of the economy

NESDP	Years	Main focused 4 e's	Main focal components of the economy	Average annual real GDP growth rate
4	1979-1981	<i>Evolution</i>	<i>Human capital</i>	3.5%
5	1982-1986	<i>Evolution</i>	<i>Economy</i>	4.3%
6	1987-1991	<i>Efficiency</i>	<i>Economy and society</i>	8.9%
7	1992-1996	<i>Efficiency</i> <i>Equity</i>	<i>Economy and human capital</i>	6.4%
8	1997-2001	<i>Efficiency</i>	<i>Society and human capital</i>	0.0%*
9	2002-2006	<i>Equity</i>	<i>Economy and human capital</i>	4.6%
10	2007-2008	<i>Efficiency</i>	<i>Environment</i>	1.2%*

Note: * denotes that the period faced structural shocks.

4. Empirical study on Thailand's economic growth factors

Based on the key growth factors reviewed in the previous section and data availability during 1979-2008, trade openness, structural change, foreign direct investment (FDI), capital accumulation, export-led strategy, and infrastructures are hypothesized to have significant and positive impacts upon economic growth in this part of the analysis. The following are

the measurements of economic growth and economic growth factors.

1. Economic growth
 - Growth in real GDP
2. Trade openness:
 - Growth in real volume of trade
3. Structural change:
 - Growth of real GDP in non-agricultural sector minus that of agricultural sector
 - Growth of real GDP in non-agricultural sector

- Growth of real capital stock in manufacturing sector minus that of agricultural sector
- Growth of real capital stock in manufacturing sector
- Growth of real capital stock in service sector
- 4. Foreign direct investment:
 - Growth of real FDI
- 5. Capital accumulation:
 - Growth of real capital stock
- 6. Export-led strategy:
 - Growth of real exports
- 7. Infrastructures:
 - Growth of real capital stock in transportation and communication sectors
 - Growth of real capital stock in electricity and water supply

All data are from Bank of Thailand. Growth rates are calculated by $-1 + (\text{value in the end year}/\text{value in the beginning year})^{(1/\text{number of years})}$.

Table 6 shows the growth rate of each variable in each of the seven planning periods as well as during the whole 1979-2008 period. The growth rate of each variable is ranked across periods. A rank "1" signifies states that the variable enjoyed its highest growth in that period. From this table, we can see that the periods that have the top two ranks of growth of real GDP are period 6 (rank 1), period 7 (rank 2). The bottom two ranked periods are period 8 (rank 7), period 10 (rank 6). The rankings in these periods in both economic growth and economic growth factors are used in the further analysis to determine the significance of each growth factor.

A clear story emerges. If we associate the growth factors over the entire period 1979-2008 with the 5.5% average growth rate in real GDP, we find that the top three factors are growth in FDI (15.2%), growth in exports (9.9%), and growth in the volume of trade (9.2%); these all point to the overwhelming importance of the openness of the economy in determining growth in GDP per capita. Those plans that fostered such growth were numbers 6,

8 and 9 for FDI and exports; and numbers 6,7, and 9 for volume of trade.

A second group of factors which grew faster than the long-term growth rate of real GDP includes capital stock in the manufacturing sector (7.6%), capital stock in electricity and water supply (7.5%) the communication sector (6.1%). These all have to do with infrastructure, necessary for both the sectoral transformation of the economy (growth of GDP of non-agriculture at 6%), and the outward orientation noted above. These factors were also the strongest in plans 6 and 7 (but not 8 or 9, because they were already in place). The recipe for success is therefore very simple: promote exports, attract FDI, but put in the infrastructure first to take advantage of both.

But did these economic results have anything to do with the planning targets in plans 6 through 9? All the successful plans (6, 7, and 9) emphasized economy plus human capital/society. In other words, either the economy or human capital alone is clearly not enough. An emphasis on economic efficiency with the spreading of benefits through human capital formation is clearly the recipe for effective growth and development in a context of globalization. We therefore cannot reject hypothesis 1, to the effect that "*Plans with outward expansion and a balance between growth and equity have the highest growth rates.*" The only disturbing element is that neither globalization, nor trade, nor FDI is mentioned explicitly in any of the plans. The results of this study also lead us to reject hypothesis 2, to the effect that "*Periods of high growth have had plans with very different weightings of the four development principles: efficiency, equity, equilibrium, and evolution.*" In reality, efficiency and equity must be the predominant principles.

We must reject hypothesis 3, to the effect that "*Plans in those periods of high growth have also had widely varying targets (economic growth, society, environment, human capital, science and*

technology, and administration)." In fact they all emphasized efficient development and use of natural and human resources, and spent little time on administration or reforms.

From simple visual inspection of Figure 1, we must also also reject hypothesis 4, which states that "*Within each plan there is a dip in growth in year 1 and a steady rise in goal achievement in years 2 through 5.*" This implies that the economy proceeds on a business-as-usual basis, without taking too much notice of the changed objectives or emphases of a given plan.

The final hypothesis relates to how much control Thai macroeconomic decision-makers currently exercise over the size and volatility of foreign capital inflows. The answer seems to be "none," leading us to reject hypothesis 5. As table 7 demonstrates, FDI growth by 5-year-plan has the highest coefficient of variation across plans of any of the macroeconomic aggregates; and is totally un-correlated with either GDP growth or the growth in any other macroeconomic variable. Similar results are found when FDI is lagged by one or two plans and when individual years are used instead of entire 5-year blocks of time. In short, FDI inflows are currently acting as a lone gunman in the Thai economy, jumping up or down as a function of the decisions of foreign investors with respect to general movements in the global economy and their perceptions of the comparative investibility of the Thai economy. We strongly recommend that Thai policy makers pay greater attention to attracting specific niches of FDI and to stabilizing those sources as much as possible in order to take greater control of macro planning.

In sum, we may conclude that Thailand's development success had something to do with emphases in less than half of the plans, that the key to success (outward orientation) was not mentioned at all, that there was no "adjustment shock" to adapt to the

announcement of the new plan, that targeting equilibrium and evolution in a plan did little good, and that FDI lies outside of the management purview of Thai macroeconomists. Further research will have to do be done, however, before one may conclude that 5-year plans are no longer necessary for the Thai and other middle-income economies.

Table 6: Comparison of real GDP growth to the growth of macroeconomic variables in each NESDP period

NESDP	Years	Growth in Real GDP	1. Trade openness		2. Structural change										
			Rank	Growth in Volume of trade	Rank	(Growth in Non-agriculture GDP) – (that in Agriculture GDP)	Rank	Growth in Non-agriculture GDP	Rank	(Growth of Capital Stock in Manufacturing Sector) – (that in Agricultural Sector)	Rank	Growth of Capital Stock in Manufacturing Sector	Rank	Growth of Capital Stock in Service Sector	Rank
1979-2008		5.5%		9.2%		3.5%		6.0%		3.0%		7.6%		4.9%	
4	1979-1981	3.5%	5	5.0%	6	1.9%	4	3.9%	5						
5	1982-1986	4.3%	4	4.6%	7	1.8%	5	4.6%	4	1.15%	3	3.3%	3	0.8%	6
6	1987-1991	8.9%	1	15.9%	1	5.4%	2	9.8%	1	9.64%	1	12.7%	1	6.7%	2
7	1992-1996	6.4%	2	7.7%	3	7.8%	1	7.3%	2	4.16%	2	11.0%	2	7.9%	1
8	1997-2001	0.0%	7	6.5%	4	-2.4%	7	-0.2%	7	-1.80%	6	1.0%	6	1.5%	3
9	2002-2006	4.6%	3	8.6%	2	2.2%	3	4.8%	3	-0.60%	5	2.4%	4	1.5%	4
10	2007-2008	1.2%	6	6.3%	5	-0.6%	6	1.2%	6	-0.29%	4	1.8%	5	1.2%	5

NESDP	Years	Growth in Real GDP	3. FDI		4. Capital accumulation		5. Export-led strategy		6. Infrastructures				
			Rank	Growth in FDI	Rank	Growth Real Capital Stock	Rank	Growth in Exports	Rank	Growth of Capital Stock in Transportation and Communication sector	Rank	Growth of Capital Stock in electricity and water supply	Rank
1979-2008		5.5%		15.2%		6.1%		9.9%		6.1%		7.5%	
4	1979-1981	3.5%	5	66.0%	1			5.1%	6				
5	1982-1986	4.3%	4	7.8%	5	2.6%	3	6.3%	5	1.0%	6	4.6%	4
6	1987-1991	8.9%	1	35.3%	2	8.3%	2	14.0%	1	7.2%	2	7.5%	2
7	1992-1996	6.4%	2	-2.5%	6	9.1%	1	7.3%	4	10.4%	1	9.4%	1
8	1997-2001	0.0%	7	12.7%	4	1.7%	5	7.8%	3	2.2%	4	5.6%	3
9	2002-2006	4.6%	3	18.7%	3	2.3%	4	8.3%	2	2.4%	3	3.4%	5
10	2007-2008	1.2%	6	-17.2%	7	1.6%	6	4.2%	7	1.5%	5	2.1%	6

Note: growth rate = $-1 + (\text{value in the end year} / \text{value in the beginning year})^{(1/\text{number of years})}$.

W. Prasert, P. Chakirongkol and P. Collins

Table 7: Means, volatility, and correlations among growth rates of GDP and key macroeconomic aggregates

Growth rates and correlations among macro variables for 7 five-year plans	Mean growth rate	Minimum growth rate	Maximum growth rate	Range in growth rate	Std. Deviation	Coeff var	Real GDP (B of B)	Real FDI (M of B)	Real import (B of B)	Volume of real Trade (X+M) (B of B)	Real Export (B of B)	Elect and water sup real capital stock (M of B)	Manufact real capital stock (M of B)	Non-agriculture real GDP (B of B)	Capital stock at 1988 prices (M of B)	Trans and commu real capital stock (M of B)	Service real capital stock (M of B)	Agri real capital stock (M of B)	Agri real GDP (B of 0f B)
Real GDP (B of B)	4.0%	0.0%	9.0%	9.0%	3.1%	76%	1	.249	.735	.813*	.720	.483	.849*	.992**	.770	.648	.739	.346	.173
Real FDI (M of B)	17.4%	-17.0%	66.0%	83.0%	26.9%	154%	.249	1	.116	.163	.258	.301	.375	.291	.252	.120	.314	-.106	.337
Real import (B of B)	8.0%	3.0%	18.0%	15.0%	4.9%	61%	.735	.116	1	.970**	.825*	.210	.724	.679	.569	.522	.621	.083	.346
Volume of real Trade (X+M)	7.9%	5.0%	16.0%	11.0%	3.9%	50%	.813*	.163	.970**	1.000	.926**	.333	.760	.761*	.612	.532	.662	.115	.385
Real Export (B of B)	7.4%	4.0%	14.0%	10.0%	3.3%	44%	.720	.258	.825*	.926**	1	.467	.660	.679	.533	.425	.594	.074	.441
Elect and water sup real capital	5.3%	2.0%	9.0%	7.0%	2.6%	48%	.483	.301	.210	.333	.467	1	.744	.534	.838*	.810	.837*	.763	-.465
Manufact real capital stock	5.3%	1.0%	13.0%	12.0%	5.2%	98%	.849*	.375	.724	.760	.660	.744	1	.868*	.974**	.903*	.946**	.581	-.162
Non-agriculture real GDP (B of B)	4.6%	0.0%	10.0%	10.0%	3.4%	75%	.992**	.291	.679	.761*	.679	.534	.868*	1	.800	.665	.751	.365	.138
Capital stock at 1988 prices	4.3%	2.0%	9.0%	7.0%	3.3%	75%	.770	.252	.569	.612	.533	.838*	.974**	.800	1	.961**	.973**	.735	-.367
Trans and commu real capital stock	4.0%	1.0%	10.0%	9.0%	3.6%	91%	.648	.120	.522	.532	.425	.810	.903*	.665	.961**	1	.980**	.857*	-.543
Service real capital stock	3.5%	1.0%	8.0%	7.0%	3.1%	90%	.739	.314	.621	.662	.594	.837*	.946**	.751	.973**	.980**	1	.785	-.387
Agri real capital stock (M of B)	3.3%	2.0%	7.0%	5.0%	1.9%	56%	.346	-.106	.083	.115	.074	.763	.581	.365	.735	.857*	.785	1	-.832*
Agri real GDP (B of 0f B)	2.1%	-1.0%	4.0%	5.0%	1.6%	73%	.173	.337	.346	.385	.441	-.465	-.162	.138	-.367	-.543	-.387	-.832*	1
							.710	.460	.447	.394	.322	.353	.758	.769	.474	.265	.448	.040	