

Resource management for Sustainable Development of Island Economies

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Abstract

What is the role of resource management in sustaining competitiveness for island economies such as the Republic of the Philippines and Hawaii? We review the history of thought on sustainable resource management and sustainable development and then turn to the threats to sustainability from the *resource curse* and the parallel *curse of paradise*. We show how the resource curse undermines the pursuit of sustainability and describe innovations in governance that can transform the curse into a blessing.

Keywords: Resource curse, sustainable development, Dutch disease

JEL codes: Q01, Q33, Q58

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Resource Management for Sustainable Development of Island Economies¹

Majah-Leah Ravago, James Roumasset, and Kimberly Burnett

"Happy families are all alike; every unhappy family is unhappy in its own way."

-- Tolstoy, Anna Karenina

I. Introduction

Prior to the release of the famous report "*Our Common Future*" in 1987, it sufficed to define sustainability in consonance with the definition of sustain -- "to keep in existence, maintain, prolong." After the Brundtland Commission (World Commission on Environment and Development) was created, a new definition emerged that successfully ensconced sustainability in the development arena.

The Commission defined sustainability as, "... *development that meets the needs of the present without compromising the ability of future generations to meet their own needs.*" Although this definition is somewhat vague and has been a source of contention, concern for sustainability is now manifestly ubiquitous. Governments, private organizations, and multilateral institutions strive to pursue economic development that is compatible with environmental objectives. As sustainability has become increasingly politicized, it is now widely used to refer to a systems approach that incorporates environment, economy, and society. The scope of sustainability has become so broad that it can include income distribution, gender equity, culture, and a host of other political goals of NGO's and their donors.²

Immediately following the report, there was an explosion of literature from economics, philosophy, and other disciplines, much of which was an attempt to specify what sustainable development meant for public policy. In the 1990s, there was a race to

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² See e.g. Hardi and Zdan, 1997.

discover a single criterion of sustainable development, and a debate emerged over whether *strong* or *weak* sustainability was that criterion.³ These criteria are now recognized as category mistakes.

Returning to the original Brundtland concept, sustainable development must allow for the inter-linkages between poverty, population pressure, and the degradation of environmental resources. The conclusion reached by the Commission is that the problems could be addressed only if these three are taken into account collectively. Figure 1 depicts the interaction of population pressure and poverty as the notorious Malthusian vicious-circle and environmental degradation, which exacerbates that circle. Population growth, in the face of a limited resource base, exacerbates poverty by lowering the return to unskilled labor. This in turn prevents mechanisms whereby increased incomes and the rising productivity of human capital lower the demand for children. The population-poverty cycle is exacerbated as households with limited resource-access strive to eke out a living from hillsides, wetlands, and other environmentally fragile areas, thus degrading the limited natural capital available to the poor.

This paper looks at the issue of managing resources for sustainable development of island economies. In particular, we investigate a comparative case of the island economies of Hawaii and the Philippines to illustrate the commonalities as well as lessons that can be drawn from each other. The next section takes the perspective of the *resource curse* in reviewing unsustainable development practices of these island economies. We discuss how rent seeking deepens fragmentation and economic stagnation. This, alongside increasing population, exerts undue pressure on environmentally fragile areas. Section III proposes a cure for these ills, a more appropriate and meaningful depiction of the three pillars of sustainability. Section IV provides specific illustration through the island economies of the Philippines and Hawaii. We conclude by exploring ways that the “curse” can be transformed into growth and how

³ In economics, “strong sustainability” prohibits any level of depletion of natural capital such as trees, water, or fish, while “weak sustainability” requires the *value* of produced and natural capital to remain constant or increase over time.

development, specialization, and innovation can spur growth and thus attain positive sustainability.

II. Nature and Causes of Unsustainable Development: Dutch Disease and the Curse of Paradise

Like Tolstoy's unhappy families, there are many pathways of unsustainable development. The first of these – excessive resource depletion and/or pollution is illustrated by Repetto and other's (1989) example of Indonesia in the period between 1971-1984. Indonesia over-exploited its oil and timber reserves in an unsustainable manner. Dynamic efficiency calls for extracting resources in accordance with the extended Hotelling rule for renewable resources (Stavins, Wagner, and Wagner 2003; Endress et al. 2005). Excess depletion of natural resources results from a failure to align private incentives with social priorities, especially through inappropriate or the lack of property rights, e.g. the ability of military units to exploit public forests or the nationalization of the oil business.

A second type of dynamic inefficiency results from waste through government failure regarding public expenditures. Panayotou (1993) illustrated such unsustainable development projects with subsidized cattle ranching operations in Brazil that deforested a lush stretch of Brazilian Amazon rainforest. Its rapid expansion brought about by unsustainable management practices led to pasture degradation which pushed ranchers to cut down additional forests in order to keep their herds. Relatively cheaper land prices and higher productivity made cattle ranching profitable in the Amazon (Volpi 2007). The extensive support the industry received from the government encouraged the industry which aggravates the problem of deforestation. The Superintendency for Development of Amazonia (SUDAM) was created with the objective of improving the economic development of the region. The well-intentioned program provided certain corporations a tax credit scheme aimed at promoting live stock ranches in the Amazon. Contrary to expectations, this example of an unsustainable development project resulted in rapid

deforestation, modest afforestation, commercial failure of ranches, and enormous fiscal costs amounting to more than \$1 billion US dollars between 1975 and 1986 (Volpi 2007).

Even if dynamic efficiency is satisfied, unsustainable development can result from excess consumption relative to investment, such that the accumulation of produced capital is too little to offset the depletion of natural capital, i.e. that total capital accumulation is negative (Arrow et al. 2004).

Beyond the avoidance of unsustainable development, we still have the question of which of the many sustainable development paths to pursue. The optimal sustainable development path will still require positive policy reforms and investments due to the augmented Malthusian dilemma depicted in figure 1. What are the positive forces of sustainable development and how can these be facilitated by government policies?

What do we know about dynamically-efficient macroeconomic development? The manufacturing sector of each set of trading countries grows faster than its agricultural sector. The service sector grows even faster. Specialization is especially rapid in the manufacturing sector.⁴ Capital accumulation, comprised of produced, human, and knowledge capital, accelerates growth. During industrialization and service sector growth, resource depletion slows, e.g. renewable forestry, bench terraces, fertilizer, renewable energy, and imports of non-renewable increase. Natural capital depletion is much less than physical and human capital accumulation, even if you add environmental degradation to resource depletion.

One illustration of macroeconomic patterns of specialization in the course of sustainable development is the coevolution of industrialization *ala* the flying geese metaphor. Formulated by Akamatsu (1962), the flying geese paradigm describes how nations align similar to the geese V-formation in different stages of development. As wages rise in most developed economies, other countries take over labor-intensive

⁴Specialization begins in the agricultural sector as Boserup effects (Boserup, 1965, 1981) as a partially offsetting effect to Malthusian involution (see Roumasset, 2008).

manufacturing for exports. For the East-Asian model, the lead goose is Japan, followed by the New Industrializing Economies of South Korea, Taiwan, Singapore, and Hong Kong. The third layer consists of Malaysia, Thailand, and Indonesia, with the Philippines and Vietnam tailing behind. The East-Asian Miracle is characterized by a virtuous circle of capital intensification and human capital accumulation whereby network externalities lead to endogenous growth.

Dutch Disease Mechanics: Appreciation of the Real Exchange Rate and Political Economy Effects

Most island economies are inherently rich in natural resources. Their tropical weather, long stretch of beaches, wealth of marine biodiversity, abundance of tropical plants, etc. earned the moniker “island paradise”. Tourism manifests the demand for these natural endowments. A sudden increase in tourism demand is the economic equivalent of a resource boom.

How can a resources boom be a curse? The term “resource curse” is commonly used to describe countries with large endowments of natural resources, such as oil and gas, but have remained at the bottom of economic development and good governance relative to less endowed countries (Auty, 1993). The geographical and geophysical characteristics make some island economies qualify as resource. As one would expect, their abundance of natural resource capital could serve as impetus for its growth. However, progress is laggard if not difficult to sustain in these island economies. Is this curse rooted in their natural endowments or in other sources?

Two features incubate the so-called “Dutch disease.”⁵ A new resource discovery or an exogenous increase in the world price of a country’s primary resource endowment increases the real exchange rate, wages and input prices, thereby inhibiting industrialization and knocking these economies out of the flock of flying geese. But the

⁵ The term first appeared in November, 1977 issue of *The Economist* describing the decline of the Netherlands’s manufacturing industry following their discovery of natural gas in the North Sea in the 1960s.

East Asian Miracle (1993) informs us that the external economies of endogenous growth theory are especially rich in exportable manufactures -- exactly the sector thereby disadvantaged.

As explained by Corden (1984 and 1982), another aspect of Dutch Disease is unproductive rent-seeking. The more the inherent resource wealth, the higher returns to lobbying, the greater the lobbying, and the greater the resulting policy distortions. Corden gave the example of industrialists adversely impacted by the appreciation of the real exchange rate increasing their lobbying effort for tariff and non-tariff protection. For island economies, these features apply except that the geographical and geophysical characteristics are not physically extracted (e.g. beach, mountains, volcanoes, natural landscape, tropical weather). Instead, these natural endowments are degraded by improper management.

We adopt Sachs (2007) geometry of Dutch disease that originated from the famous *Salter* (1959) model of non-tradeables. Figure 2 describes how an economy can catch the disease. The model distinguishes between traded and non-traded goods (and services). The latter is commonly defined as goods that face high transport cost prohibiting trade and typically includes production of food and services for local use. Agriculture and manufacturing are classified under traded goods. A discovery of oil (Sachs, 2007) or a one-time improvement in technology gives rise to a third sector dividing traded goods into non-booming and booming sectors (Corden and Neary, 1982). The latter also noted that a windfall discovery of a new resource and an exogenous increase in the price of a purely exported product in the world market can cause the occurrence of such a boom.

Likewise, any sudden surge of capital inflows, such as remittances, foreign aid, foreign direct investments, earnings from tourism and military bases that create a booming trade sector can be analyzed in the Dutch Disease framework. The general effect is channeled through the appreciation of the exchange rate where there is an increase in the price of non-tradables relative to tradeables, which impoverishes the trade

sector. It must be noted that a boom arising from a vibrant tourism industry has unique features not present in the other source of boom mentioned above. Tourism converts non-traded goods and services into tradables by bringing tourists into the country to consume these goods. Thus, it has a direct effect in increasing the price of non-tradables thereby affecting the real exchange rate (Copeland, 1991).

Figure 2a depicts an economy before the boom occurs. The production possibility frontier (PPF) shows all the possible combinations of traded and non-traded goods the economy can attain. The tangency between the PPF and the consumer indifference curve (II) gives the equilibrium point E and following down the line through horizontal and vertical axes gives the level of traded (E_T) and non-traded goods (E_N), respectively. The line RER is the slope of PPF at point E or the relative price of traded goods to non-traded goods and is equal to the real exchange rate. It is given by the equation, $RER = P_T/P_N$. Thus, the steeper the line the more depreciated the currency is. Maintaining the assumption of a small open-economy, dollar prices of traded goods are exogenously set while dollar prices of non-traded goods adjust to clear supply and demand in the domestic market.

A booming sector is created for reasons indicated above which increases the output of traded goods shown in Figure 2b. The PPF shifts to the right by the amount of the boom, H. Point E* is the new equilibrium with an increase in both traded and non-traded goods. The former is raised to an amount ($E^*_T + H$) but the output of the non-booming traded sector shrinks to E^*_T . The slope of the PPF at E* is now less steep relative to E -- a real exchange rate appreciation. An appreciation of the currency implies an increase in the opportunity cost in the production of traded goods, hence an erosion in the competitiveness of traded goods.

The movement from E to E* is brought about by spending and resource movement effects (Corden and Neary, 1982). Assuming that non-traded goods are normal goods such that income elasticity is positive, if the income generated from the booming traded sector is spent (partially or fully) on non-traded goods then the price of the latter

increases relative to traded goods. Thus, a real exchange rate appreciation takes place-- a spending effect. The resource movement effect involves a direct and indirect de-industrialization (Corden, 1984).⁶ As wages and input prices rise because of the increased productivity in the booming sector, they push the mobile factor labor out of the non-booming traded sector into non-traded sector. This leads to a decline in the output of the non-booming traded sector causing a direct de-industrialization. Concomitantly, a movement of the mobile factor out of the non-traded sector into the booming traded sector boosts the price of the former. This reinforces the appreciation of RER brought about by the spending effect. This dynamic bolsters the resource movement effect from the non-booming traded sector into the non-traded sector causing an indirect de-industrialization.

The Returns to Rent-Seeking in Resource-Rich Economies

In island economies, rent seeking is stronger because the conferred economic rent is greater. Figure 3 shows the famous iron triangle which exemplifies this stronger rent seeking.⁷ The politicians sitting at the apex of the triangle form alliances with the bureaucrats who share the same intention of broadening and fortifying their power base. Support from the member of the citizenry is needed to justify their existence. However, the citizenry is divided into organized and disorganized groups. Although the citizenry comprises the majority, its interests are diffuse and organizational costs large.

On the other hand, small special interest groups have more sharply focused objectives and ease of organization (Olson 1982 and Olson and Zeckhauser 1966). Furthermore, their participation in political affairs creates a solid electoral support that politicians seek. Meanwhile, the special interest groups intentionally cultivate the alliances of politicians and bureaucrats to further their own private agenda and protect their own businesses. Their partnership with bureaucrats allows them to enjoy lax regulations and special favors while the politicians can influence the legal environment

⁶ See Corden (1984) for a detailed discussion on de-industrialization.

⁷ See e.g. Lowi, 1979.

conducive for expansion and profitability of their business. The reinforcing arrows make it an invincible iron triangle. With these dynamics, the minority of special interests readily tyrannizes the needs of the relatively poor majority.

III. The Cure for Unsustainable Development

Three pillars of sustainability

The proposed cure for these ills is the “three pillars of sustainability” as articulated by Nobel Laureates Robert Solow, Kenneth Arrow, and Amartya Sen, Harvard’s Robert Stavins and many others. These are: 1) Interlinkages, especially between natural resource systems, the environment and the economy; 2) Dynamic efficiency, especially regarding conservation of resources and the environment; and 3) Intertemporal equity, which is increasingly represented (e.g. in the Stern Review, 2006) as intertemporal neutrality.

These principles specify the objective of sustainable development. As Anand and Sen (1994) note, sustainability is properly viewed as a potential property of development policies and the growth of the integrated economy and the environment -- the environomy. Once the objectives are stated as above, one can sensibly ask, "Under what conditions does pursuit of the objectives logically lead to the provision for a perpetually satisfactory environment for human life?" If the parameters of the one's environomic model are sufficiently negative about technological change and substitutability between natural capital and produced capital is less than 1, pursuit of said environment is futile. That is, no set of actions are consistent with perpetuation of satisfactory standards of human life. On the other hand, making plausible assumptions about substitutability, even without technological change, a "golden rule" path (see Endress et al 2005 and Roumasset 2002) of utility is feasible and the three principles guarantee it.

“Positive sustainability” posits sustainable development as neither an objective nor a constraint. Rather, it is based on established economic policy analysis but

incorporates both natural capital and intergenerational equity. Natural capital can be represented by resource use in the aggregate production function (e.g. Toman et. al, 1993). Intergenerational equity is incorporated into the planner's objective function by setting the planner's pure rate of time preference equal to zero. Two necessary conditions arise to obtain the optimal, intergenerationally neutral consumption/savings/resource depletion profile provided that consumption is feasible:

$$(1) \quad MB = c + MUC + MEC$$

$$(2) \quad MP_K = \eta g$$

The first is the so-called Hotelling condition for optimal resource extraction where the rule is to extract an additional unit of the resource until the marginal benefit (MB) of using the resource is equal to the marginal user cost (MUC) plus the marginal externality cost (MEC). The second condition is the Ramsey savings equation, which states that produced capital should be accumulated in any given period until its marginal product declines to equal the growth rate of consumption in that period times a measure of the planner's aversion to intergenerational inequality, η . Optimal consumption increases monotonically and asymptotically to reach the "golden rule" steady state level.⁸ Moreover, adherence to the Hotelling and Ramsey conditions enables the environomy to increase its potential limits by moving its PPF outward. As illustrated in Figure 4, positive sustainability is attained and win-win efficiency is feasible.

Implementation of win-win environmentalism requires modeling the interlinkages and dealing with political impediments to the implied public policies. Policy models of global warming containing both climate change and the economic system provide well developed -- although not definitive -- examples, inasmuch as they solve for specific policy prescriptions. Sustainability is not a new paradigm but represents an injunction

⁸ For simplicity, population is held constant. For the case of constant population *growth*, the RHS of equation 2 becomes $\eta g + n$, where n is the population growth rate and g becomes the growth rate of per capital consumption. See Roumasset and Endress 1996 and Endress et al. 2005 for further details and an extension to renewable resources and pollution.

not to give short shrift to intergenerational equity and system interdependence in policy analysis.

IV. The Philippines and Hawaii

The Philippine disease

The Philippine disease is characterized by stagnation owing to fragmentation, which coupled with population pressure exerts undue pressure on environmentally fragile areas. The formidable presence of rent seeking exemplified by the iron triangle exacerbates the disease plaguing the archipelago. The big conglomerates are able to price their products high and deter entry because of political connections (e.g. agricultural commodities most notably rice and sugar, transport services, electricity and cement in the 1990s), which exacerbates the situation since these are critical inputs to production. Other glaring instances where the iron triangle is at work are the NAIA Terminal 3 fiasco, the NFA rice monopoly, the exemption of the sugar industry from land reform and WTO concession, and the recent controversy⁹ on the Philippine National Broadband (NBN) which involved the highest government officials.

The economic development of the country has been characterized by a premature decline of agriculture (Roumasset 2003, Clarete and Roumasset 1987). In the pre-war period, the country enjoyed a high level of human capital in terms of educational attainment, relatively well established civil, judiciary, and legal institutions. Yet, despite having these solid institutions, its development has been substandard (Balisacan and Hill

⁹ Also known as the NBN/ZTE deal, the controversy involves allegations of corruption primarily involving the former Commission on Elections Chairman, the First Gentleman and the President Gloria Macapagal-Arroyo regarding the proposed government-managed NBN for the country. The contract was awarded to the Chinese firm Zhong Xing Telecommunication Equipment Company Limited (ZTE), a telecommunications and networking equipment provider. The issue erupted in the media around August 2007. It led to the resignation of the COMELEC chairman, the unseating of incumbent House Speaker, and the alleged "kidnapping" of designated National Economic and Development Authority (NEDA) consultant-turned-NBN/ZTE witness Rodolfo Noel Lozada, Jr.

2003). The 70s saw the Philippines in the second tier of the flying geese, then slowly slipping down in the 80s and sliding to the tail end during 90s (Table 1). The economic decline is attributed to low investment in rural infrastructure and research and development (R&D) and government policies that were biased against agriculture. In the 1980s the government adopted the policy of protectionism and import-substitution that led to premature growth industrialization (Clarete and Roumasset 1987). But even with limited trade liberalization, the Philippines has not capitalized on its apparent comparative advantage in labor-intensive production (Balisacan and Hill, 2003).

The agriculture sector is a mirror image of the economy, still comprising 14.2% of GDP as of 2006, down from 25.6% in 1960. However, domestic policies and institutions have restrained efficiency and raised the cost of doing business in agriculture, which dulled productivity growth and proved to be detrimental to the country's competitiveness in the global marketplace.

Poverty in the country remains stubbornly high at 11% in 2007 and reduction of poverty and malnutrition is slow relative to its neighbors. It is well recognized that sustained economic growth at a rate higher than population growth is key to reducing poverty. However, the country's poverty reduction shows muted responses to growth (Table 2). A high level of population coupled with low investment translates to declining labor productivity throughout the economy. This also implies low levels of investment in human capital formation. More people in poverty result in greater migration into fragile environmental areas causing soil erosion and other dimensions of environmental degradation (Balisacan and Rola, 2007). The lower resource base in turn exacerbates Malthusian pressures on labor productivity.

After the peaks and troughs in its GDP growth, the Philippines posted an average of 6% growth starting in 2004. Although this is welcome news, a careful examination of the macroeconomic fundamentals reveals that the economy is growing but investment is shrinking (See Figure 5). Bocchi (2008) offered three explanations to explain this puzzle. First, the public sector cannot boost public investment due to fiscal constraints. Second,

the capital-intensive private sector is hesitant to expand investment due to expectations of lower return, and the fast-growing service sectors, which include electronics assembly, voice-based business process outsourcing (BPO). Third, information and communication technology (ICT) would still enjoy increasing profits even without augmenting their investments at the rate of GDP growth.

These recent developments are reminiscent of the capital-intensive “finishing stage” industrialization (Power and Sicat, 1971; Bautista, Power, and Associates, 1979). The economy is growing despite the low investment rate due to factors that fuel demand and drive supply. As a high-fertility Dutch disease economy, skilled labor migrates out in pursuit of greener pastures in industrialized economies abroad. In 2007, remittances account for 10% of GDP, invigorating consumption and growth. The remittances and transfers can be equivalent to the windfall income generated by the booming oil industry in resource curse economies. It spurs growth through consumption but network externalities are absent not allowing for investments to follow through. On the supply side, the service sector is the one that raises exports. It is thus possible for a country to grow even without external economies, but growth where dynamics are missing cannot be sustained.

Whether the huge capital inflow from remittances and transfers has indeed caused Dutch disease effects is currently being debated. Tuaño-Amador et. al. (2007) and Yue (2007) maintain that the country is becoming overly dependent on remittances and may have been infected by the disease as indicated by the strengthened peso. On the other hand, a more recent study by Tan (2007) contended that the seemingly squeezed manufacturing and agricultural exports could not have been a product of Dutch disease resulting from flow of remittances. Accordingly, the performances of the two sectors have been historically slow long before the surge of remittances and need not be explained by Dutch disease but by structural problems that plagued the sector (Tan, 2007).

The argument for and against remittances causing Dutch disease may need further empirical and statistical analysis. The fact remains that it adds another distortion to the

Philippine economy, and that these sectoral booms may have adverse general equilibrium effects on other sectors.

All of these are in accordance with the theory that the Philippines is a fragmented economy wherein wages in the favored enclave have risen without conferring substantial gains to the unemployed and low-wage workers in the rest of the economy.(Roumasset, 2003). Fragmentation is the result of three forms of “protection”¹⁰:

- 1) Geographic protection: As an island economy, the Philippines has natural barriers to internal integration. These are exacerbated by inadequate transportation infrastructure and misguided transport regulations, esp. shipping (Balisacan (1990) and Patalinghug, 1996) As a result of these factors, the growth-enhancing effects of trade liberalization are conferred disproportionately to port cities and their environs (e.g. Metro Manila, Cebu, and Davao). Producers in rural areas are sheltered from international competition to the detriment of consumers and wage earners.
- 2) Economic protection: Despite some progress in trade liberalization, agriculture, services and some manufacturing (e.g., steel and some petro-chemicals) remain protected both by tariff and non-tariff barriers. These distortions pull resources into the protected enclave both distorting factor prices and artificially increasing the real exchange rate. These forces discriminate against agricultural exports and forward linkages into agricultural processing and packaging (e.g., Clarete and Roumasset, 1987). As a result, the agricultural sector remains inward looking and insulated from productivity-enhancing competition.
- 3) Political protection: Even as trade barriers and bureaucratic red-tape unnecessarily increase the cost of light manufacturing, agricultural processing and packaging, and production for export, politically influential entrepreneurs manage to obtain exemptions or easy passage through the barriers. For example, even though the poultry lobby has managed to use the WTO apparatus to protect themselves from importation of low market-valued chicken parts, McDonalds has succeeded in

¹⁰ Drawn from Roumasset 2003.

exempting themselves. Similarly, Coca-Cola and other large companies have managed to secure low cost sugar, even as potential small-scale candy makers and canned fruit manufacturers are unable to access the same benefit. And while Monsanto and Cargill may be able to accelerate the BPI quarantine procedure and other restrictions on importing seeds, farmers that want to experiment with new varieties would face great difficulty in doing so. Relatedly, implementation of land reform can be delayed or avoided altogether through political influence.

Fragmentation begets the economy's stagnation. The diminishing source of agricultural productivity growth, limited employment opportunities outside agricultural sector, high population growth, slow poverty reduction and the continued existence of institutions that are discordant with environmental sustainability are major impediments to achieving sustained rural growth.

The curse of paradise: Hawaii

Tourism continues to be the highest contributor to Hawaii's gross state product (Table 3). The sector employs the largest workforce and is a major source of revenue and growth of the state's economy. Hawaii's tourism is not only confined to recreation and leisure, it also includes military tourism, and second home tourism. Battlefields, other war and military landmarks continue to be one of the main attractions for tourists. Meanwhile, the tropical weather entices residents of other states and countries to buy a second home in Hawaii.

When tourists visit Hawaii, they consume non-traded goods and services (e.g. restaurant meals, shopping, heritage and culture) as well as unpriced and underpriced environmental amenities (e.g. beaches, mountains, volcanoes, rock formations, tropical weather, etc). The tourism boom stimulated demands for these non-traded goods, increasing their prices relative to traded, hence appreciation of the exchange rate—a Dutch disease effect. The income received by the service sector is a rough estimation of the value of the unpriced environmental amenities (Copeland, 1991).

Population grew rapidly in 1980 at 26% and then declined to 9% in the decadal census of 2000. As population growth rate declines, migration increases (Table 4 and Figure 6). The pattern of emigration and immigration influence the composition of the state's human capital. The high cost of living compelled residents to leave the island and seek other opportunities in the mainland. Most problematic is the so-called "brain drain" where the newly trained and educated young cohort leaves the state. Foreign immigrants from Asia replace them altering the composition of the human capital base. The brain-drain phenomenon is symptomatic of the resource curse in island economies. Human capital, which initially gets its best return in industrialized and service economies, migrates into the non-traded sector and then seeks better opportunities in the tourism industry. In high-wage-low-fertility Dutch disease economies such as Hawaii, skilled labor migrates out and unskilled labor enters the market.

Economic policy in the State of Hawaii may be more intrusive than any other State in the Union. Not only are its citizens more heavily taxed than in most other states (Table 5), but a myriad of regulations such as land use laws, water rights restrictions, licensing and permit requirements, and labor laws limit the incentives of private entrepreneurs to allocate resources to their highest and best use. Economic planning in the State of Hawaii has often made use of the concept that government should "pick the winners," i.e. determine which private enterprises would diversify the economy, provide employment opportunities, and be competitive with production activities outside of the State. The idea that government can somehow select the winning enterprises combines a number of fallacies. First, government bureaucrats are bound to know less about profitability than the private sector. Second, targeting certain industries for success implies that some sort of government subsidies will be involved to stimulate or start up the chosen ones.

Subsidies in turn may do more harm than good. They isolate enterprises from the very competition that leads to innovation and productivity gains. Managerial slack and what Harvard economist Harvey Leibenstein calls "x-inefficiency" increase. Moreover, subsidies necessarily involve relative penalties to all non-subsidized enterprises as labor

and other factors of production are pulled into the subsidized industry and away from other parts of the economy.

Unfortunately, the Rainbow State shows signs of unsustainability. The iron triangle is very much visible in Hawaii, as evidenced by broken politics (Roth 2006, 2008), white elephants¹¹ (e.g. the Hawaii Convention Center and the proposed \$4 billion fixed rail system), and the relative neglect of its natural capital. Feral pigs and other invasive species are causing soil erosion in Oahu watersheds while feral goats and cattle are destroying vegetation in Maui. Bare spots caused by these feral animals result in heavy erosion and sediment plumes, exacerbating the decline of coral reefs. As resources decline, congestion and water-scarcity increase, biodiversity is threatened, shorelines are hardened, and water quality is threatened by sewage spills. Like other island economies, Hawaii's isolation only makes matters worse, with high transaction and transportation costs limiting specialization.

Greedy and Smart Growth

Experiences of Hawaii and the Philippines exemplify how rent seeking can be a form of “greedy growth” (return to Figure 4). Rent seeking pushes the economy and its PPF inward. One particular area where government may grant special favors, allegedly to stimulate economic development, is by granting tax exemptions and credits. It is possible to make the case that an omniscient and benevolent despot, unsullied by power and not tempted by the lure of political patronage, could indeed use such fiscal incentives to stimulate healthy economic development. For example, some enterprises, by their very nature, tend to build skills and create transferable knowledge more than others. On the other hand, other enterprises may produce negative external effects, e.g. by adding to congestion and pollution. Aside from perverse political incentives, it would be possible to develop a set of principles regarding which industries should be exempt from

¹¹ White (albino) elephants were once regarded as holy in Thailand and other parts of Asia. Special food needs and providing access for worship made keeping a white elephant a very expensive prospect. Today the phrase is used to describe burdensome possessions and government projects whose cost exceeds their usefulness.

particular taxes and which industries should be subject to surtaxes. Hawaii's symbolic efforts like tax credit for "high-tech" are doomed to fail. Formally called Act 221/215, the law stipulates a 100% credit to anonymous investors without neither evidence nor guarantee that the investment will generate new jobs or bring in revenues to the state. It even allows for almost half of the investment to be spent in places other than in Hawaii. In 2006, the use of tax credits soared to \$100 million, the highest use to date (Wiles, 2008). It is ironic that the highest posting occurred in 2006 during a decline of tax revenue growth.

In addition to the white-elephant convention centers in Hawaii and the massively subsidized fixed rail system for Oahu, the Bataan Nuclear Power Plant¹² and the mercantilistic structuring of the food and cement industries in the Philippines further exemplify the high-level of rent-seeking. Other examples are government offices being controlled by political appointees, price-controlling politicians that try to put a "cap on gas," picking winners, and creating barriers that increase the cost of doing business (e.g. permits).

On the other hand, the "smart growth" movement is very attractive to the behavior modifying anti-freedom coalition, protesting growth instead of rent seeking (return to Figure 4). An illustrative example can be found in Portland. An architect had a conception of a "smart" condominium where residents needed only two cars for every three units. The concept was that many residents wouldn't need cars because the condominium was next to a light rail station and the first floor was to be occupied with merchants who would supply occupants' needs. The result was complete disarray. Instead of a beautiful condominium and an idyllic courtyard with prolific social intercourse between people of high environmental sensibilities, many condo units remained vacant and the courtyard virtually abandoned. Business in shops whose owners bet on brisk business both from residents and rail riders who would find it convenient to stop and shop were disappointed and had to abandon their shops. Eventually, these problems led to the abandonment of the whole building, which then became a magnet for squatters.

¹² Completed in 1984 at a cost of 2.3 billion dollars (Wilson, 2004). <http://www.energybulletin.net/node/866>

This outcome came as a surprise to city planners, but could have been anticipated from Adam's Smith's dictum that planners and legislators seem to imagine that people have no principles of motion other than those supplied by the enlightened planner; they cannot understand that people have their own principles of motion to which policy-makers must accommodate.

Both greedy and smart growth retard economic development and worsen the environment. The only difference is smart growth does it with sensibilities¹³. Ironically, advocates of smart and greedy growth can become strange bedfellows in support of the same wasteful project. A prototypical example is fixed rail, which caters to special interests (developers, unions, consultants, and construction contractors) and simultaneously symbolizes sustainability to true believers.

V. Transforming the disease into growth

A number of lessons can be drawn from the experiences of oil-rich countries (Indonesia, Malaysia, United Arab Emirates, even resource-poor China and Mauritius) that successfully followed a dual track strategy in effectively transforming the disease into growth. The strategy follows two parallel roads, one that pursues a dynamic market economy in the initial stages of reform and the other is a gradual and steady reform of the rent-distorted economy (Auty and Pontara 2008). This has the potential of breaking the impregnable iron triangle while allowing for the creation of a pro-reform political constituency. In island economies, the revenues generated by the tourism industry of Hawaii, or the remittances of the Philippine migrants can be channeled into expansion of public investments in infrastructure, improvements in human capital, and creation of social safety nets, while keeping some in the government coffers for the use of future generations. Following Sachs (2007), if revenues from resource earnings are invested in

¹³ “Sensibilities” as meant by Jane Austen in her famous 1811 novel, *Sense and Sensibility*. Sensibility is defined by Merriam-Webster as refined or excessive sensitiveness in emotion and taste with special responsiveness to the pathetic. High-minded environmentalists are long on sensibility but often short on sense.

infrastructure that raises workers' productivity in both traded and non-traded sectors, then a boost in non-resource traded goods can take place (Figure 7a).

Another way to offset the “Dutch Disease” effects of a resource boom is to tax the resource sector and invest in increased productivity of the non-traded sector. As Sachs shows (figure 7b), this strategy can result in a depreciation of the country's exchange rate and promote exports. In the Philippine case, this suggests that reducing special tax exemptions for overseas Filipino workers and investing the increased tax revenue in agricultural R&D is worthy of consideration.

Development and specialization

Positive sustainability can also be attained through development and specialization if properly facilitated. Roumasset (2004 and 2008) shows how horizontal and vertical specialization increase in the natural course of development as illustrated in the evolution of contracts. These two types of specialization opportunities expand as a country industrializes. As farm production intensifies, labor inputs increase, until the last stage wherein capital-labor substitution overcomes input intensification. Labor contracts become increasingly specialized, with contracts made on a task-by-task basis. Hired labor therefore stimulates horizontal specialization across tasks. A good illustration of vertical and horizontal specialization is found in the institution of piece-rate by teams.¹⁴ A team is hired to complete a task, such as transplanting, which is easily monitored by *ex post* inspection. The team may produce, for example, a stack of cane stalks that are of uniform length and ready for planting. We can think of the task as akin to an intermediate good. Thus, a team represents a separate firm with the team manager or a foreman serving as its chief executive officer. The latter signs a contract with the sugar grower and is liable for any sub par performance. Vertical specialization also increases. Landowners may specialize in land improvements, such as irrigation, and employ tenants who specialize in management-intensive labor, who in turn, employ and monitor workers who specialize in arduous and more easily supervised tasks.

¹⁴ This illustration along with other examples can be found in Roumasset (2007).

In agriculture, specialization is limited by the scope of assembly because of non-convexities being less compact. In this sense, the capacity for specialization in industry may be quantitatively greater than that of agriculture but not necessarily qualitatively different. In manufacturing, horizontal specialization of final products are facilitated by vertical coordination of giant retailers. Size of the market allows specialization of component varieties such that standardization is not needed. This approach is formally modeled by Dixit and Stiglitz (1977) and later updated by Krugman (1979) dubbed as “love of variety.” The thirst for variety on the part of the consumers and perfect substitution in production results in each firms producing different product. Hence, each firm is a monopoly of the particular variety of the product. This process has no natural end point in manufacturing, inasmuch as further market growth allows further vertical specialization of sub-part production etc. Moreover, vertical coordination facilitates horizontal specialization according to diverse preferences and a diversity of costs over space and time.

As specialization proceeds, more and more complex patterns of coordination are facilitated. A metaphor can be found in the *new supermarket economics* where coordination begets specialization. A vertical coordination is set in motion whereby farmers are increasingly linked to specific retailers by means of complex chains that transform farm products over space, time, and form. Thus, the process replaces the cumbersome and costly method of indirect coordination via inventories. Wholesalers coordinate specific farmers with specific retailers with appropriate procurement, quality, safety, and timing standards and thereby confer transaction cost advantages on large farms.

Specialization and Innovation

Specialization, development, and innovation is depicted in international trade between the developed “North” country and the developing “South” country where a *specialization ladder* occurs. Grossman and Helpman (1991) call this “*quality ladder*,” while Feenstra and Rose (1997) considered this as part of the product’s life cycle. In this

setting, North initially specializes in production of and therefore exports of personal computers (PC). Eventually, South, who could produce cheaper PCs cloned the technology and then eventually drives North's product out of the market. Meanwhile, North innovates newer and more superior machine that will then erodes South's export base. Hence, the cycle goes on.

Specialized knowledge driving innovation is the other side of Schumpeter's creative destruction (Schumpeter 1942). Schumpeter believed that innovation is the propeller of economic development but it comes at a price -- creative destruction. Cars replacing horse and buggy, compact discs with cassette tapes, book corners superseded by large bookstore, which in turn is slowly being displaced by online bookstore, best exemplify this notion. Such is the dynamics so that temporary market power can actually be derived from innovation. As market environment evolves, the cycle of innovation and creative destruction continues.

VI. Conclusion

If necessity is the mother of invention, specialization (learning by doing) is the father. Rent-seeking stifles innovation through fragmentation and stagnation. Transparency and accountability are the enemies of rent-seeking. Government policies should be framed by the principles of positive sustainability – dynamic efficiency and capital formation that allows for standards of living to perpetually increase in pursuit of the golden rule level. The role of public policy in sustainable development is gleaned from the oldest lesson in economics: *don't dictate, facilitate*. As Adam Smith has noted, *“The man of system (planner) ... is so enamoured with the supposed beauty of his own ideal plan of government, that he cannot suffer the smallest deviation ... He seems to imagine that he can arrange the different members of a great society with as much ease as the hand arranges the different pieces upon a chess-board. He does not consider that, in the great chess-board of human society, every single piece has a principle of motion of its own, altogether different from that which the legislature might choose to impress upon it.”*

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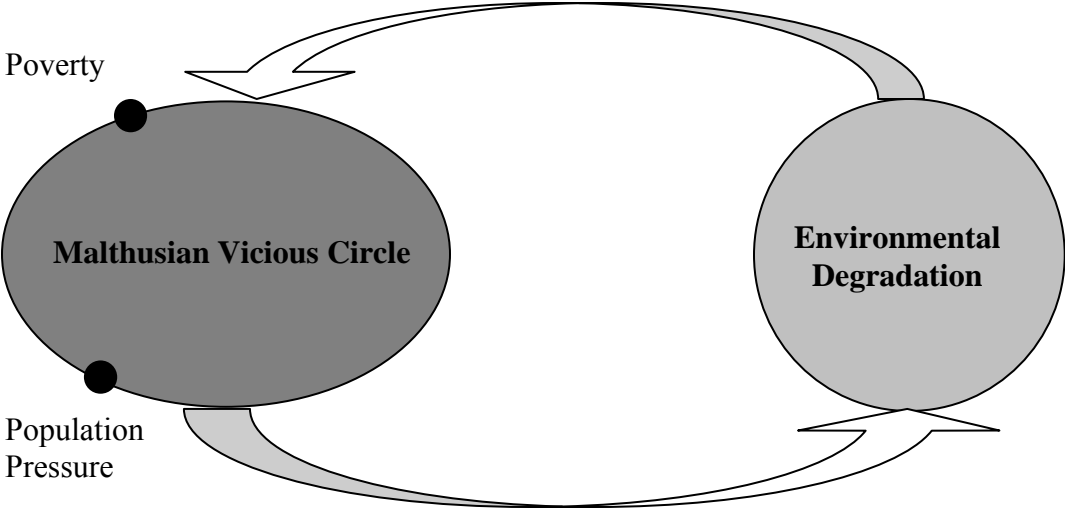
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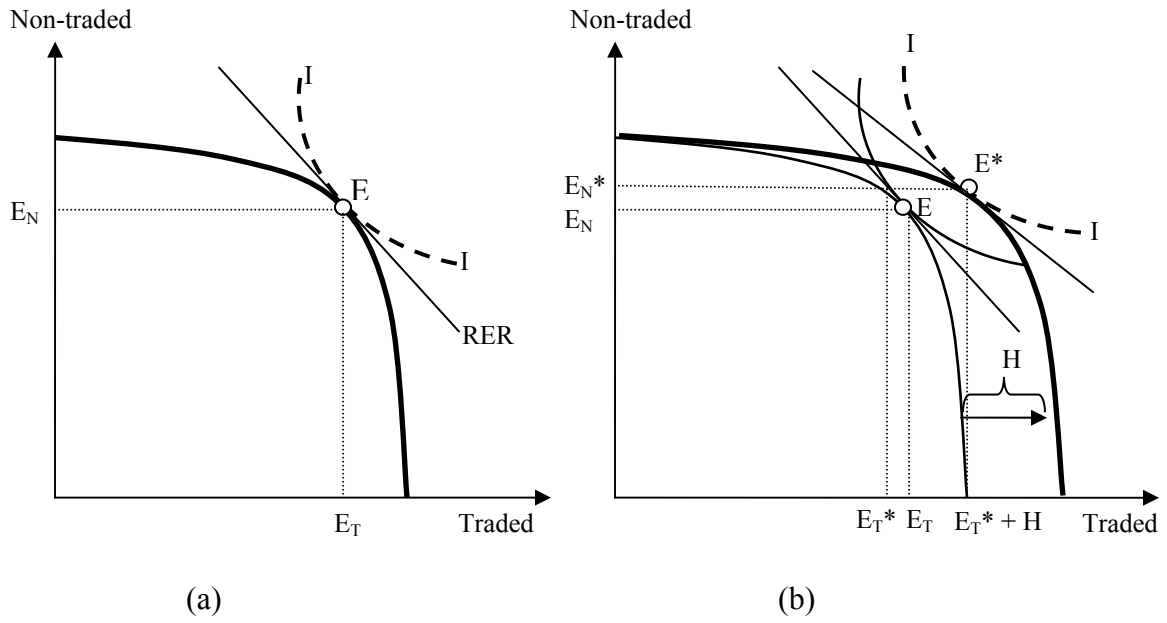
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Figure 1. Brundtland vicious circle.



Source: Roumasset, 2002.

Figure 2. The geometry of Dutch Disease



Source: Sachs, 2007.

Figure 3. Iron triangle

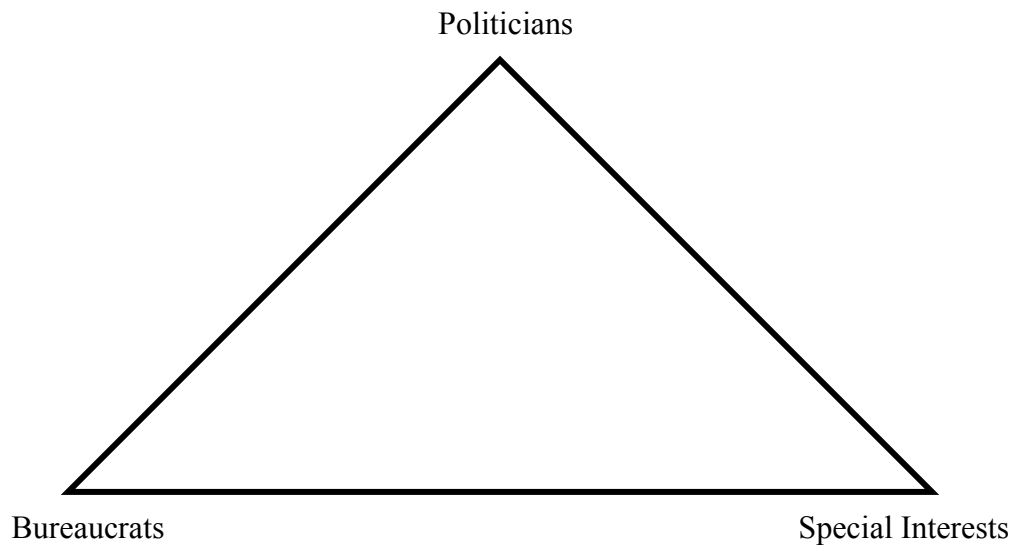
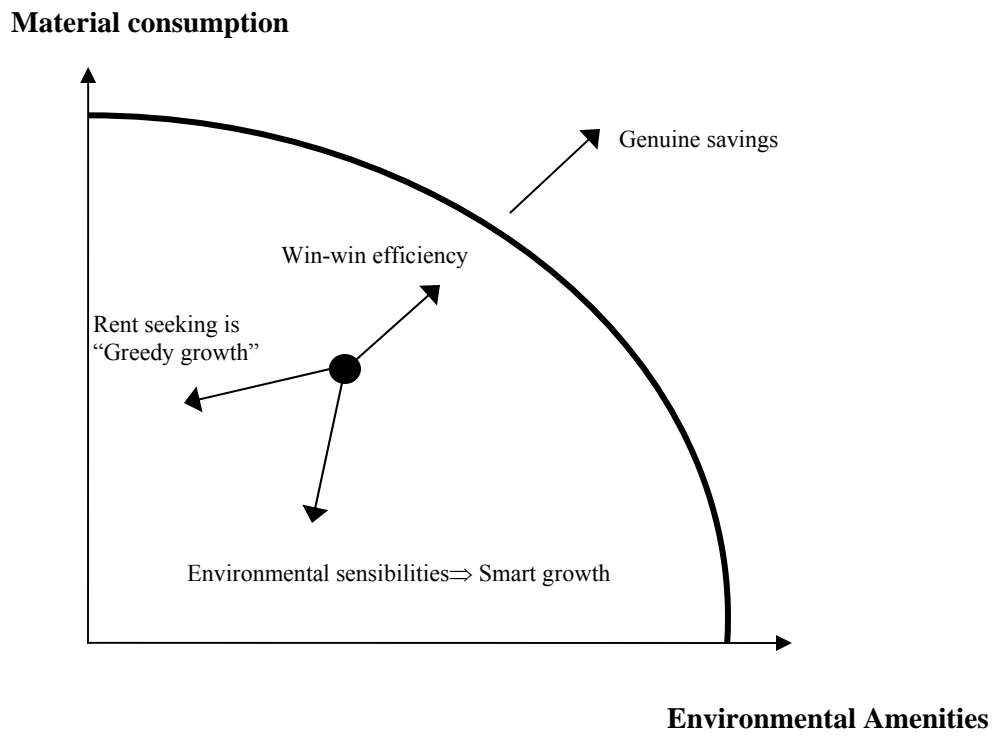
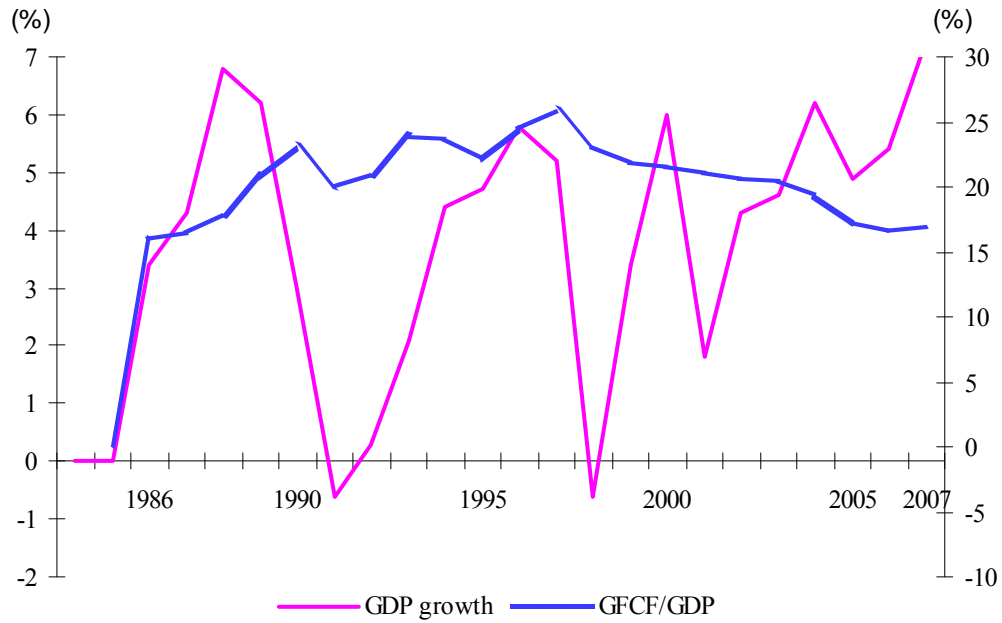


Figure 4. Smart growth, greedy growth, and sustainable growth



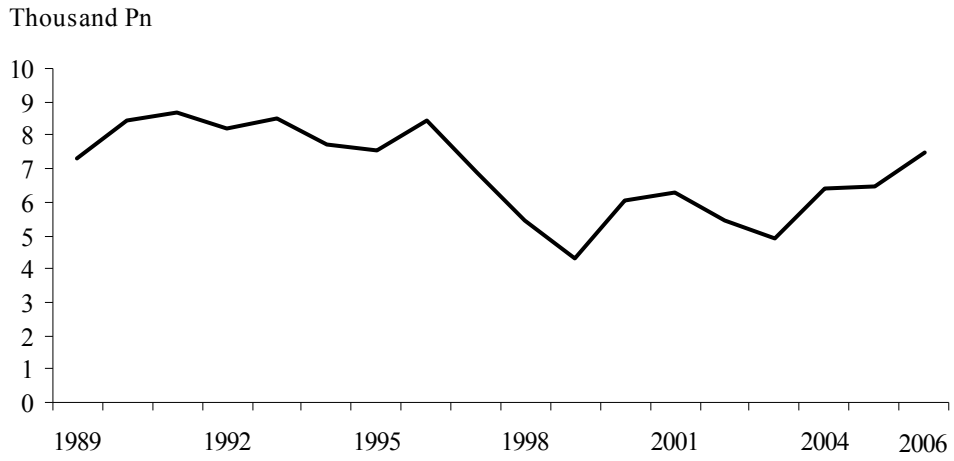
Note: Adapted from Roumasset and Endress, 1996.

Figure 5. Gross domestic product (GDP) growth rate and ratio of gross fixed capital formation to GDP, Philippines.



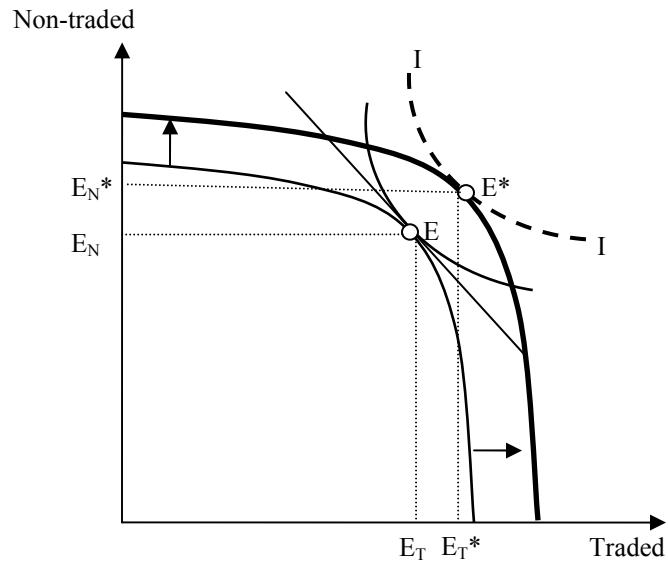
Source: National Statistical Coordination Board, Asian Development Outlook 2007, 2008

Figure 6. Immigrants admitted in Hawaii, 1980-2006.

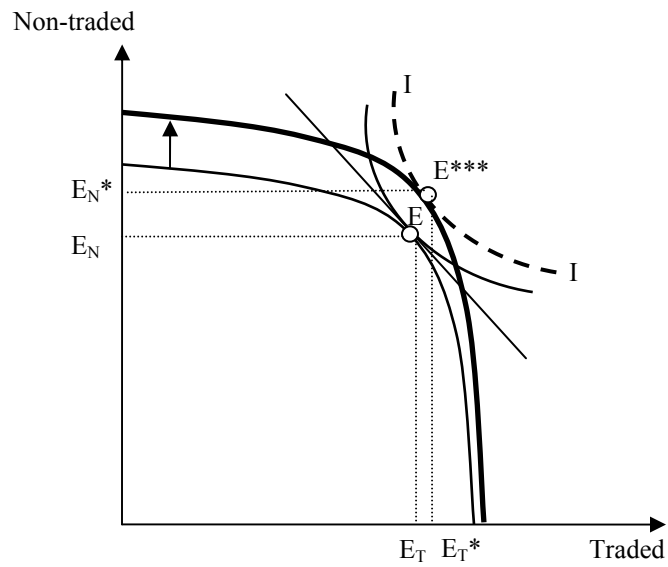


Source: Maryland Office for New Americans and Yearbook of Immigration Statistics

Figure 7. Transforming the disease into growth



(a) Effects of public investments



(b) Real depreciation

Source: Sachs, 2007.

Table 1. Income and Growth

	Per Capita Income (PPP constant 2000 Int'l \$)		Average GDP Growth Rate	
	1975-1977	2003-2005	1975-1977	2003-2005
<i>East Asia (including Southeast Asia) China</i>	833	4,984	5.83	8.98
	603	5,506	4.90	10.17
<i>Southeast Asia</i>				
Indonesia	1,148	3,289	6.94	5.17
Malaysia	3,245	9,320	6.71	5.83
Philippines	3,558	4,416	6.66	5.39
Thailand	2,082	7,418	8.05	5.97
Vietnam	1,032	2,558	3.39	7.86
<i>South Asia</i>				
Bangladesh	1,099	2,618		
India	983	1,756	1.42	5.83
Nepal	1,133	2,864	6.03	8.65
Nepal	836	1,366	2.96	3.73
Pakistan	1,015	2,014	4.44	6.63

Notes:

3-year averages centered on the years shown.

Data for Vietnam starts at 1984; data is average for 1985-1987.

Source: World Development Indicators, 2007.

Table 2. Relatively low poverty elasticities

Countries	%
China	2.9
Thailand	3.5
Indonesia	3
Philippines	2.2

Note: Figures are growth elasticities of poverty reported in Cline, 2004.

Table 3. Hawaii's Gross State Product

Gross State Product in 2005: \$53.7 billion

Contribution by Sector (2003)	In Percent
Tourism	25
Military	15
Construction	10
Total government	22.2
University	3.1
Agriculture	3

Source of basic data: UHERO Economic Information Service
 (<http://www.uhero.hawaii.edu>).

Table 4. Statewide Population, (in Thousands)

	1971	1975	1980	1985	1990	1995	2000	2006
Resident Population	0.8	0.9	1.0	1.0	1.1	1.2	1.2	1.3
Defacto Population ¹	0.8	0.9	1.1	1.1	1.2	1.3	1.3	1.4
Armed Forces	0.1	0.1	0.1	0.1	0.1	0.1	0.04	0.0
Net Migration	17.0	6.0	2.5	0.3	5.7	-1.0	-7.9	0.6

Source of basic data: UHERO Economic Information Service (<http://www.uhero.hawaii.edu>).

Note: Data are 3-year moving average centered at year shown.

^{1/} Resident and de facto population are mid-year estimates (July, 1). De facto population includes all persons physically present in area, regardless of military status or usual place of residence. Net migration is a residual based on net change less natural migration.

Table 5. State and local tax burdens, 2007.

State	Combined State and Local Tax Burdens by Rank		Adding Federal Taxes to State/Local Changes Rankings			Change in Ranking After Adding Federal Taxes
	State & Local Tax Burden	Rank	State	State, Local, & Federal Tax Burden	Rank	
Total	11.0%			32.7%		
Vermont	14.1%	1	Vermont	35.1%	5	4
Maine	14.0%	2	Maine	33.9%	10	8
New York	13.8%	3	New York	37.1%	2	-1
Rhode Island	12.7%	4	Rhode Island	35.1%	6	2
Ohio	12.4%	5	Ohio	32.4%	18	13
Hawaii	12.4%	6	Hawaii	33.0%	16	10
Wisconsin	12.3%	7	Wisconsin	33.3%	13	6
Connecticut	12.2%	8	Connecticut	38.3%	1	-7
Nebraska	11.9%	9	Nebraska	31.8%	22	13
New Jersey	11.6%	10	New Jersey	35.6%	3	-7

Source: Tax Foundation calculations based on data from the Bureau of Economic Analysis, Department of Commerce.