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HOW MUCH DOES ETHNICITY MATTER? A CLOSE EXAMINATION OF
ETHNIC DIVERSITY, PUBLIC POLICIES, AND ECONOMIC GROWTH IN SOUTH
AND SOUTHEAST ASIA

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ABSTRACT

This Thesis will study the importance of ethnicity in a country's public policies and economic growth. First, a number of theories that indicate a relationship between ethnic diversity and economic growth will be presented in the first chapter. Next, the correlation between ethnic diversity and economic performance will be examined further in Chapter 2 through econometric analysis. In addition, affirmative action in India, Malaysia and Sri Lanka will be discussed in detail in Chapter 3. Specifically, their actual outcomes and effectiveness of the policies will be analyzed. The goal is to see how policies that directly address ethnic issues work in reality. Finally, my thesis concludes with a brief discussion of the statistical results and implications, along with a comprehensive discussion on the problems and impact of the affirmative action policies in India, Malaysia and Sri Lanka.

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Introduction

Since the demise of the Soviet Union, the global order has changed tremendously. The clash between capitalism and socialism, though still contentious, has become less striking than it was in the Cold War period. Instead, ethnic conflicts have become a prevailing theme since the end of World War II, especially in the developing world: witness, for example, the atrocities in Rwanda, the massacres in Cambodia, and the apartheid in South Africa. While these tragedies have often been intertwined with authoritarian government and economic chaos, developing countries that possess a certain level of ethnic diversity clearly seem to struggle with ethnic issues. In contrast, developed countries with high levels of ethnic diversity (such as the U.S.) seem to handle the issue well. This leads to an intriguing question: What exactly is the role of ethnic diversity in economic development? Relatedly, does ethnic diversity slow a country's growth in general? If so, in what ways does ethnic heterogeneity influence a country?

These questions are what I address in this thesis. It is a complicated and difficult task, since these issues are extremely broad and the problems are sensitive to numerous economic and political factors. Nevertheless, I attempt to tackle this task through two channels. First, I present several prominent theories and models relating ethnic diversity to economic performance, and then I provide analysis to indicate any statistical evidence of the potential relationships. The second approach involves case studies of individual countries; in particular, the affirmative action policies of several countries in South and Southeast Asia are analyzed in detail. The goal of these case studies is to examine the effects and efficiency of the affirmative action policies.

Certain economists suggest there is a negative impact from ethnic heterogeneity on economic efficiency. It is noteworthy that although several theories have suggested a positive correlation between ethnic diversity and growth (mainly through compensatory effects on productivity (Alesina and Ferrara, 2005)), the overall predictions regarding the effect of ethnic diversity tend to be pessimistic: in specific, ethnically diverse countries are more likely than homogeneous ones to have cumbersome economies and are more likely to be engaged in ethnic conflicts. However, despite the indications of a strong statistical relationship between diversity and economic development, my own research contradicts the idea of a

direct correlation between ethnicity factors and economic indicators, not to mention ethnic diversity and economic efficiencies. Though a correlation between ethnic diversity and political indicators is supported by my data analysis, the correlation between ethnic diversity and economic performance is obscure.

This thesis is arranged in the following manner. Chapter 1 presents and investigates five major theories that link ethnic diversity and economic growth. Chapter 2 analyzes the empirical data and the results of regression analysis. Chapter 3 examines three case studies of affirmative action in India, Malaysia and Sri Lanka. The final section wraps up the thesis with a discussion and conclusions.

Chapter 1: Related Theories and Models

In this chapter, I analyze several theories and models that relate ethnicity and economic growth. In particular, I elaborate on three major theories: corruption and growth, a war of attrition, and the common-pool problem. Two additional theories are also reviewed. As the basis of the relevant empirical work and policy debate, these theories are crucial in that they serve as the basis and framework for this thesis. After presenting each theory, I describe its content and implications, while establishing each one's underlying support for the relationship between ethnic diversity and unsatisfying economic growth.

Corruption and Growth

Though perhaps not obvious at first, ethnic heterogeneity encourages a cumbersome and inefficient government. It has been found that ethnic diversity promotes a wide range of corruption, especially in developing countries (Mauro, 1995). Depending on other institutional variables (e.g., political stability), the scale and depth of corruption may vary. However, evidence has shown that corruption tends to worsen and cause greater damage to the economic situation in poorer countries than it does in richer ones. Corruption, according to Mauro, is found to lower investments, thereby slowing economic growth. Through prudent empirical work and analysis, Mauro found that countries with greater degrees of ethnic diversity usually have higher levels of corruption.

Guided by conventional indicators of institutional efficiency such as political change and stability of labor to test his hypothesis, Mauro (1995) adopted vital indices drawn from Business International a private firm that sells the indices of corruption and institutional efficiency to banks, multinational companies, and other international investors. These indices serve as a useful assessment tool for prospective and current investors in the regions. Mauro also used ethnic fractionalization as an independent variable in his analysis; this is the probability that two randomly selected individuals in a country or other communal environment will not belong to the same ethnolinguistic group. The most well-known data set on measuring ethnic diversity Mauro used is the one calculated by Taylor and Hudson and known as the index of ethnolinguistic fractionalization (ELF), derived on the basis of raw data collected by the Soviet Union in the early 1960s.

Analysis substantiates that ethnic heterogeneity is significantly related to low institutional efficiency, political instability, bureaucratic inefficiency, and high degrees of corruption. With the influx of additional ethnolinguistic groups, worse corruption is likely to occur (Mauro, 1995). In extreme cases, ethnic conflict may well lead to civil wars and traumatize an entire economy. Empirical estimates also show that corruption negatively impacts the investment rate, while institutional inefficiency causes lower investment. Since elements such as institutional and bureaucratic efficiency and political instability are key components of an economy, ethnic heterogeneity (by adversely affecting all of these factors) would very likely impede a country's future development. Further, by lowering the investment rate (which, according to Mauro, is a "robust determinant" of long-term growth), a high level of ethnic diversity is no doubt an obstacle to economic prosperity. To stress his point, Mauro also noted that in addition to impacting investment through increased corruption and political instability, ethnolinguistic fractionalization may also directly affect private investment. He posited that given difficulties and prejudices among different ethnic groups, ideas diffuse more slowly and technological innovations within the country are less likely to occur. Consequently, ethnically-diverse countries may grow more slowly because of a lack of technological developments.

In short, Mauro (1995) confirmed that ethnic heterogeneity discourages investment by increasing corruption and political instability, thereby slowing economic growth in the long run. Broadly speaking, if corruption were mitigated in these countries, their economies would become healthier. For example, if Bangladesh were to improve the integrity and efficiency of its bureaucracy to the level of Uruguay (which has a significantly lower corruption level, according to Mauro), its investment rate would rise by almost five percentage points and the rate of growth of its annual GDP would increase by over half a percentage point.

While Mauro (1995) managed to construct a link between ethnicity and growth through investment, other scholars have developed theories that connect corruption with growth. According to Shleifer and Vishny (1993), three models are commonly discussed when analyzing the industrial organization of corruption. The first is corruption that involves only one bribery taker (or seller); this is

referred to as a monarchy in historic and political terms. The second model is a situation where the sellers act independently while each one strives to maximize his profit. The third scenario is one in which each public good can be provided by at least two agents, and sellers act as competitors in the industry. Shleifer and Vishny (1993) assert that the third model is the least corrupt, and that the second is the most damaging and inefficient. While each independent agent struggles to grab his share of the profit, corruption exhausts the resource pool of society. Such corruption without any coordination is not uncommon in developing countries. For instance, in India, traveling a road between two certain towns will require paying a bribe in every village through which the road passes (Shleifer and Vishny, 1993). In this situation, inefficiency caused by independent bribes induces high levels of traffic and extremely low levels of toll collections, resulting in low amounts of social and consumer welfare.

In Easterly and Levine's (1997) work, they argue that ethnically diverse countries are likely to produce situations analogous to Shleifer and Vishny's "uncoordinated bribe-taker." Ethnic diversity is likely to generate more independent bribe-takers since each ethnic group may operate within different political and economic power structures. The condition of uncoordinated bribe-takers is exacerbated in ethnically diverse countries since barriers of ethnicity, language, religion and certain prejudices prevent the detection and report of deviation from normal economic situations. Furthermore, independent bribery damages a country's economy by draining social welfare and economic well-being, a situation often accompanied by a weak government. When economic desperation such as this persists, public pressure will likely be ignored and, unless international action is taken, the economy will continue to suffer.

By proposing the condition of "uncoordinated bribe-takers," Shleifer and Vishny's (1993) model substantiates the relationship between ethnic heterogeneity and poor economic performance. When already afflicted by the reduced social welfare due to corruption, a nation will suffer further due to the secrecy surrounding corruption. To hide the act of corruption, people take extra precautions. These translate into extra costs and continue to mount as long as corruption persists and remains unchecked. The situation of independent bribery caused by ethnic diversity will look almost like a dead-end loop — one

in which corruption causes the misery of the masses, while the inability to enforce penalties on the corrupt people (as a result of poor infrastructure and a weak government) further encourages corruption to spread.

The negative effect of corruption on growth is even more evident in the works of Meon and Sekkat (2005). They introduce two common beliefs. One is that corruption impedes economic growth, referred to as the “sand the wheels” argument. The other is that corruption is actually beneficial to countries with immature and inefficient governments. This latter hypothesis purports that in the context where most projects lag due to government problems, bribes will function as “speed-money” to stimulate economic growth. Additionally, bribes may reveal buyer’s preferences which are otherwise difficult to detect. This second belief is called the “grease the wheels” argument. Meon and Sekkat (2005) test this “grease the wheels” hypothesis in the hope of supporting the opposite argument. Not surprisingly, the results of their investigation turn against their initial hypothesis and provide strong support for the “sand the wheels” argument.

Corresponding to Mauro’s earlier (1995) results, Meon and Sekkat (2005) found that corruption significantly slows economic growth. In addition, the situation worsens in countries suffering from a weak rule of law and an inefficient government. However, one of their results contradicts Mauro’s major finding: their regressions show that higher levels of corruption tend to have greater investment rates, a finding which directly contradicts Mauro’s hypothesis. Meon and Sekkat’s explanation is that poor countries are more likely to invest in fancier projects and more advanced machines rather than in common public goods such as education; this occurs because by purchasing machines that the officials don’t really need, they get to keep a larger share of the bribes and questionable payments taken.

Meon and Sekkat’s (2005) work is significant in that they show corruption seems to affect growth more directly than one would have imagined. Regardless of the role of investment, briberies and “questionable payments” alike harm the economy in ways yet to be explained, but are definitely detrimental to the whole economy.

In my own analysis, ethnic heterogeneity will be regarded as the independent variable, and growth rates will be treated as the dependent variables in the regression analysis. Based on a robust

growth model, I attempt to test the relationship between ethnic diversity and economic performance in the long run.

War of Attrition

Ethnic heterogeneity is closely related to the generation of tensions and to the possibility of articulated rebellion and revolt (Esteban and Ray, 1994). Wars and conflicts arguably are traumatic events that can damage economic development; they often give rise to a struggle over fiscal policies between different socio-economic groups. Though not focusing on ethnicity in particular, Alesina and Drazen (1991) note that heterogeneity within the population is a crucial element in explaining delays towards economic stabilization on the heels of a conflict. In many situations, the process leading to stabilization can be described as “a war of attrition” between distinct social groups. Usually, according to Alesina and Drazen (1991), the economic stabilization with a political consolidation will lead to a resolution of a distributional conflict.

The model created by Alesina and Drazen (1991) is a generalized theory designed to pinpoint the determinants of delays to stabilization and to evaluate the overall timing of stabilization. Evidence suggests that agreement about the necessity for stabilization is often easy to reach: however, the way in which the burden of higher taxes and expenditure cuts should be allocated is at the center of sharp disagreements. Since concession means a disproportionate cost for one side, groups in dispute tend to wait until the others concede so as to avoid the larger share of stabilization’s cost (Alesina&Drazen, 1991). Interestingly, the more unequal these socio-economic groups are, the sooner the stabilization occurs. Typically, weaker groups are forced to bear the larger portion of the costs. Moreover, the greater the cost of recovery is, the further delayed the expected date of stabilization is. As a result, during prolonged delay, infeasible policies are often implemented as a “temporary relief” for the situation.

In my thesis, the relevance of this model (war of attrition) is that heterogeneity among the population will generate longer periods of instability, partially explaining why ethnically diverse countries often adopt poor policies, especially in times of crisis. When groups in tension gather information about other groups to concede, stabilization would get delayed when they each suffer a loss

of welfare (Easterly & Levine, 1997). During periods of delay in the stabilization process, crucial elements in financial markets and other sectors may be distorted, implying an unhealthy economic environment. Ethnic diversity, by encouraging people to enter a war of attrition, is prone to invite economic hardship in both the short run and in the long run.

The Common Pool Problem

It has been argued by Easterly and Levine (1997) that separation of powers between distinct groups can lead to the common-pool problem, where “each group seizes its share of the pool of rents until the pool is exhausted” (pp. 1214-1215). Ethnically-diverse societies, by definition, have distinct groups, with separate powers and economic interests. Thus, ethnic diversity can facilitate situations in which this “common-pool” problem is prevalent and hard to stop due to a lack of checks and balances. From shared resources to various kinds of financial activities, things are continuously sliced into pieces, and occasionally taxed out of existence, due to the interests of different groups.

The common-pool problem is essentially the “tragedy of the commons” (Hardin, 1968) in a classic context. The situation addresses the problem of population explosion and the resulting environmental issues. The well-known analogy involves a pasture in which herdsman keep as many cattle as possible, grazing on a common parcel of land. After centuries of dispute and tribal wars, social stability has been reached, at least temporarily. Since each herdsman is a rational being, each seeks to maximize his profit by adding one more animal to his herd. Before long, all realize that adding another animal is the only sensible thing to do. Then every herdsman unboundedly increases his use of the commons, while the resources remain limited. The tragedy occurs when “freedom in a commons brings ruin to all” (pp. 1243-1248).

Theoretically, common-pool refers to goods that are non-exclusive but rival. Fundamentally, both common-pool problem and public goods games could be simplified as a game of prisoner’s dilemma in which the only rational way is to cheat, when in fact cooperation would make both better off (Apestegua and Maier-Rigaud, 2006). The rationale of the common-pool problem helps to explain why some

activities are almost taxed out of existence in certain ethnically diverse countries, and why economic development and public programs are so often hard to foster in these countries.

Polarized Preferences and its Effect on Contributions

Other theories suggest that polarized tastes and preferences could result in the unsatisfying public goods and services in many developing countries.

Given a high degree of ethnic diversity, it is often difficult for the majority of a population to form a consensus on the usage of public goods. Due to the nature of substantially different preferences, public policies in these countries are often unsatisfying and controversial. For example, in an ethnically diverse country, schools may very likely bring less satisfaction to certain citizens. Due to different preferences for the language of instruction, curriculum and location, less education may be seen as an optimal outcome in the society (Alesina and Spolaore, 1997). Even if a more satisfying education could be provided, it would simultaneously be so costly that output and growth would inevitably suffer. In general, a diverse population invites an inefficient level of public goods provided and tends to have a poorer socio-economic environment, compared with a homogeneous society (Easterly and Levine, 1997).

Alesina, Baqir and Easterly (1999) provided evidence connecting ethnicity and economic performance. By creating a model that relates individual preferences for the type of public goods to the amount of goods offered, they successfully linked ethnic diversity (on the community level) to a possible lower provision of public goods. In addition, they buttressed their model through a series of econometrics works. By analyzing data on U.S. cities, metropolitan areas, and urban counties, they found a negative relationship between ethnic diversity and spending on core public goods; equivalently, the amount of public goods provided was found to be lower in areas with greater degree of ethnic heterogeneity. They also concluded that their research supported theories claiming that ethnically diverse countries would value patronage more and would be collectively careless about fiscal discipline. Moreover, they identified a serious problem with segregation in ethnically diverse communities; specifically, since the provision of public goods tends to be lower for segregated disadvantaged groups, these groups tend to fall further behind, which forms a “vicious cycle” (pp. 1274).

Alesina and Ferrara (2005) also verified that ethnic diversity is inversely related to the amount of public goods available. In particular, since different groups have variegated preferences for the types of public goods desired, actual outcomes are likely to lower the utility obtained from public good consumption, especially among disadvantaged groups. Furthermore, they examined a model focusing on the costs and benefits of diversity. Interestingly, they found that the more fragmented a country is in terms of ethnicity, the higher the provision of private goods and the lower the taxes collected for public goods. They found that public good provisions were indeed lower in fragmented societies. However, it is worth mentioning that they also suggested that ethnic diversity might have some positive effects on the economy by compensating labor productivity. However, they found the evidence inconclusive for the productivity argument, and the positive effects seem to be less evident than the negative ones.

Other Theories

In addition to the theories and models presented above, the relationship between ethnic heterogeneity and economic growth can be illustrated under the context of other relevant theories. In particular, exploitation and theories of reciprocity and altruism could be adopted here.

In ethnically diverse countries, exploitation among groups often exists, usually with the presence of discrimination, prejudices, or even segregation. Under a model introduced by John McDermott (1997), heterogeneous groups are likely to exploit each other. Exploitation, in McDermott's context, is the systematic imposition of economic, political, and social restrictions on one group by another within the same nation (McDermott, 1997). The position of the exploiter is determined by the groups' initial wealth. In other words, the wealthier a group is, the more important it is and the more likely it is to become the exploiter. Moreover, exploitation often takes in the form of coercive wealth transfer, such as predation. The distinguishing characteristics among the groups might be natural features, but the model does not suggest any inherent advantage of one group over another. McDermott argued that intermediate groups, such as productive minorities and poor majorities, are most likely to be exploited. In particular, predators find it economically attractive to exploit the relatively "weak" groups by various means of coercive wealth transfers. Social conflict between the weak and the strong may persist and, ideally, any of the

advantageous groups could seize its profit from a common pool of capital. Moreover, population growth and migration could trigger an exploitative situation.

Furthermore, nations rife with exploitation will generally have a poor allocation of capital and slow growth (McDermott, 1997). Since the social status of the weak group can change over time, the exploiter will find it more and more costly to sustain the exploitation, eventually causing economic growth to slow down. In addition, McDermott notes that exploitation encourages predators to expend their capital in inappropriate ways (for instance, expanding the resources) due to insecurity surrounding property rights. Thus, the rate of growth would also decrease in this situation. Over the long run, exploitation would cause greater income inequality in the society, further impeding economic growth.

In short, the model of exploitation demonstrates situations in which one ethnic group exploits another, jeopardizing economic development. Historical events involving segregation and apartheid may be explained using this model.

In addition to the theory of exploitation, an association between ethnic diversity and economic performance was also indicated by the work of Okten and Osli (2003). In this paper, two theories were proposed. First, since community-level production often relies on mutual trust between different groups of people, ethnically diverse societies may have low levels of trust and therefore may lack the norms of reciprocity. As a result, it might be more costly to produce services for heterogeneous groups with certain degrees of communication and information barriers. In other words, the transaction costs tend to be higher in ethnically diverse societies, thereby jeopardizing economic production. The second hypothesis is based on inter-household considerations. The theory is that ethnic diversity may impact contributions through altruistic preferences. When the number of similar households increases in a community, the individual household is likely to contribute more. Moreover, the inter-household effect also seems to influence the time-transfer decision. Evidence suggests that households prefer to spend time with people from the same ethnic group (Alesina and LaFerrara, 2000). In addition, it generates disutility for individuals who interact with people from a different ethnic group. Olten and Osli also conducted econometric analysis on data from Indonesia and found that ethnic diversity has a negative effect on both monetary and time

contributions to communities. Therefore, according to Olten and Osli, people living a highly heterogeneous community would contribute less to their village.

In conclusion, a number of theories and models suggest the possible causation between ethnic diversity and economic growth. In general, most of the theories reviewed here suggest that ethnic heterogeneity creates an unfriendly environment for economic growth. In particular, ethnically diverse countries tend to have high levels of corruption, war of attrition conditions, common-pool problems, high levels of exploitation over less advantaged groups and a low provisions of public goods, resulting in lower levels of production and economic growth. The theory of corruption in particular supports a negative correlation between ethnic diversity and economic efficiency. Therefore, the relationship argued by various theories is not optimistic and, according to the theories presented, ethnic diverse countries are bound to generate poor economic performance.

Chapter 2: Data Analysis

In this chapter I examine empirical evidence concerning the relationship between ethnic diversity and economic performance. Key data and models are introduced, and the results of cross-country regressions are interpreted and discussed in detail. Using variables like Ethnolinguistic Fractionalization (ELF), I analyze the partial association between ethnic heterogeneity and growth of GDP per capita, through proxies such as bureaucratic quality, political upheavals and trade policies. Questions and suggestions regarding the variables and regressions are addressed briefly at the end of this chapter.

Description of Key Data

The most important variable used in this analysis is the ELF index for 1961, which provides information for 150 countries. As a variable, ELF measures the probability that two randomly selected individuals in a country belong to different ethnolinguistic groups. The higher the index, the more ethnically fragmented the country is. The prototype for this variable, ETHNIC, was derived from Soviet data calculated in the early 1960s (Easterly and Levine, 1997). In addition to ethnic divisions, ETHNIC reflected whether or not minority groups were at risk of official discrimination, whether there was substantial violence against minority groups, and whether there was a certain level of separatist movements. In essence, ETHNIC was closely linked with social stratification and conflict, elements that could disrupt a country's long-run growth. Despite the advantages of ETHNIC, certain defects in its methodology (e.g., institutional bias and missing values) led to its restructuring. ELF evolved to improve the coverage and quality of the relevant measures, providing more comprehensive data. In other words, ELF is an improved version of ETHNIC.

Before proceeding to data analysis, a caveat in using this particular measurement of ethnic diversity must be acknowledged. Since ethnic identity can be interpreted subjectively, the ambiguity of certain ethnic divisions may very likely bring differentiated results. For example, separate American groups could be treated as either separate ethnic groups or a catch-all "indigenous peoples." In many places around the world, ethnic identity is dynamic and mingled, making the issue more complicated. For

instance, a Muslim in northern India might choose to be a member of a certain caste when doing his job, but would never emphasize his caste identity in his religious life (Ali, 2002). From this standpoint, it is likely that neither ETHNIC nor ELF is a perfect fit for accurately describing the degree of ethnic heterogeneity within a certain country, since ELF focuses on ancestry and both ETHNIC and ELF take ethnic identity as a given. Nevertheless, to simplify things, I chose ELF61 as the primary measurement of ethnic diversity, since ethnic divisions based on ancestry are the most reasonable one for my research.

TABLE I
Ethnolinguistic Fractionalization (ELF)
(150 countries, 1961)

Fifteen Most Fractionalized Countries		Fifteen Least Fractionalized Countries	
Country	ELF61	Country	ELF61
Uganda	0.909	South Korea	0.003
Tanzania	0.906	North Korea	0.004
Zaire	0.902	Portugal	0.006
Ivory Coast	0.898	Haiti	0.014
Liberia	0.898	Japan	0.015
Cameroon	0.894	East Germany	0.017
India	0.887	Samoa	0.017
Kenya	0.883	West Germany	0.026
Madagascar	0.877	Poland	0.028
South Africa	0.877	North Yemen	0.037
Nigeria	0.870	Norway	0.039
Philippines	0.870	Egypt	0.044
Ghana	0.868	Ireland	0.045
Chad	0.851	Denmark	0.049
Mali	0.840	Iceland	0.055

Source: Roeder 2001.

Table I shows a portion of the dataset. Given the theories and models introduced in Chapter 1, it is not surprising to see that the most ethnically fractionalized countries are typically those with the most troubled economies. Generally, people in the most fractionalized countries have a lower average income, or GDP per capita. On the contrary, countries that are the least fractionalized are usually the developed countries which have the most advanced economies in the world. For example, Uganda has an ELF index of 0.909, meaning that given a random selection of two individuals from Uganda, chances are nine out of

ten (90%) that those two will belong to different ethnic groups. In 1965, Uganda had a GDP per capita of only \$614 USD. In contrast, Portugal, with an ELF of 0.006, had a GDP per capita of \$2407 USD for that same year (World Bank, 2010), almost four times that of Uganda. Even at a quick glance, it appears that countries with fewer ethnic divisions seem to grow better while countries with more ethnic diversity tend to have more lagging economies.

Regression Framework

To capture the effect of ethnic diversity on the economy as a whole, a robust growth model is crucial in the development of a well-supported analysis. In my thesis, I will use an exogenous growth model developed by Jeffrey Sachs and Andrew Warner, based on the Solow growth model and the constant-returns-to-scale condition (Sachs and Warner, 1997). Starting with a simple function in which output (q) equals total factor productivity (θ) plus physical capital (κ) and human capital (h), Sachs and Warner derived a growth model by including a function in which GDP growth equals the growth rate of output plus growth of labor force and technical change (see **Appendix II** for a detailed proof). After assessing the dynamics of human capital accumulation, they arrived at the following theoretical equation:

$$(dy / dt)_i = \beta_0 + \beta_1 q_i + \beta_2 \mathbf{Z}_i + \beta_3 h_i + \beta_4 h_i^2 + (n - \pi)_i + \varepsilon_i(*)$$

where (dy / dt) refers to GDP growth per capita, q is output, \mathbf{Z} is the set of exogenous variables contributing to productivity, h_i and h_i^2 are elements of human capital, $(n - \pi)$ is the net growth of the labor force, and ε is the error term. Ideally, \mathbf{Z} represents a comprehensive set of exogenous variables such as geographic elements and the amount of natural resources. Statistically, β s are estimated coefficients of each variable: these are the quantitative indicators of the relationship between each variable and the dependent variable (dy / dt) . All the subscripts i refer to country i for each individual case, and the error term ε is “independently and identically distributed” (Sachs and Warner, 1997, p. 186).

TABLE II
Summary of Data

Variable	Number of Observations	Mean	Standard Deviation	Minimum	Maximum
Growth of GDP per capita (1965-1990) (annual percentage rate)	95	1.7445	1.89183	-2.37331	7.40759
GDP per capita in 1965 (PPP adjusted)	108	2637.185	2709.246	292.0001	11638
Current account in 1985 (% of GDP)	105	-3.54076	8.43255	-52.69149	22.3723
Landlocked (=1)	150	0.23333	0.42437	0	1
Landlocked (=1), excluding European countries	150	0.19333	0.39624	0	1
Share of years open (1965-1990)	140	0.24945	0.39726	0	1
Life expectancy in 1965	150	56.20533	12.06608	33.5	74.1
Share of natural-resource exports in 1970 GDP	100	0.1551	0.16278	0.0064	0.88563
Share of land that is tropic (%)	150	0.163433	0.255251	0	1
Bureaucratic quality	83	2.96386	1.97821	0	6
Assassination (per millions of people)	101	0.034005	0.10138	0	0.6753
Corruption	83	3.19277	1.88355	0	6
Rule of Law	83	2.91566	2.00125	0	6
Revolutions and Coups (per year)	122	0.20341	0.25148	0	1.19
Ethnolinguistic Fractionalization (1961)	121	0.47131	0.277895	0.003	0.909

Note: Please see **Appendix I** for detailed data description and sources.

Following Sachs and Warner's model, I use per capita GDP growth for 1965-1990 (Penn World Tables 5.6) as the dependent variable. I also use life expectancy in 1965 as the proxy for human capital (World Bank, 2010). For net labor growth, I calculate the difference between the average annual growth of population (aged 15-64) and the growth of total population between 1965 and 1990, again using World Bank data. As noted in Sachs and Warner's paper, it is important to include enough exogenous variables in variable Z to reach the desired level of robustness. In other words, since an economy is essentially dynamic, many variables (including life expectancy and investment) can be influenced by economic growth itself. Hence, it is critical to include enough variables that are either fixed in nature or are already embedded in the system so that the impact of economic growth on them is small and negligible. Ideally, such a variable Z should include measures of geography, measures of resource endowments and measures of economic policy (Sachs and Warner, 1997).

As proxies for geographical elements (see Table II), this analysis (following Sachs and Warner, 1997) relies on data indicating whether a country is landlocked or not and the proportion of land that is tropical. I also use the portion of natural resources in export in 1970 to quantify the resource density of a particular country (i.e., it is a proxy for resource endowment). For measures of economic policy, I have chosen the current account (in 1985) as a percentage of total GDP to show whether the country is a saver or non-saver, reflecting that country's fiscal policy. I chose the data in 1985 since the 1985 data covers more countries than do the data of other years. In addition, indices of institutional quality such as bureaucratic quality, numbers of assassinations per million people, level of rule of law, a measure of corruption, and numbers of revolutions and coups per year have been selected to measure the overall efficiency and quality of a particular government. For my purpose, I decided to use bureaucratic quality (bq) as the proxy for institutional quality since none of the others work as nicely as bq does. Furthermore, to quantify a country's trade policies, I have also included its shares of years open to trade during 1965-1990, calculated in Sachs and Warner (1995). Theoretically, countries that are always open to trade develop faster and healthier than do closed economies. Finally, ELF61 is added to the independent variables, and ELF61 is the key variable I want to test.

TABLE III
Ethnic Diversity and Long-run Growth
(Dependent Variable is Growth of Real GDP Per Capita From 1965-1990)

Independent Variable	Estimated Regression Coefficients (with t-statistics in parentheses)					
	(1)	(2)	(3)	(4)	(5)	(6)
lngdp65	-1.428 (-4.53)*	-1.5039 (-4.78)*	-1.3989 (-4.27)*	-1.562 (-4.96)*	-1.2187 (-3.54)*	-1.01498 (-3.15)*
ca1985	0.0664 (-3.07)*	0.06461 (3.04)*	0.07037 (3.27)*	0.06635 (2.95)*	0.07257 (3.41)*	0.06201 (3.12)*
n - π	1.5656 (-2.88)*	1.6761 (3.10)*	1.8107 (3.26)*	1.1859 (2.31)*	1.7153 (3.11)*	1.8621 (3.65)*
landlocked(=1)	-0.97332 (-2.50)*					
landlneu(=1)		-1.38634 (-2.90)*	-1.3839 (-2.88)*	-1.0035 (-2.41)*	-1.2583 (-2.61)*	-1.0328 (-2.28)*
open6590	2.3136 (4.74)*	2.3691 (4.97)*	2.30534 (4.82)*	2.48804 (4.81)*	2.1951 (4.60)*	2.1455 (4.87)*
GDP1965*open6590	-0.00021 (-2.18)*	-0.00025 (-2.68)*	-0.00025 (-2.53)*	-0.00011 (-1.05)	-0.00024 (-2.55)*	-0.00029 (-3.24)*
lifex65	-0.21992 (-0.93)	-0.3108 (-1.31)	-0.39316 (-1.57)	0.0489 (0.28)	-0.435 (-1.75)	-0.23528 (-1.00)
life65Squared	0.00208 (1.02)	0.00291 (1.42)	0.00346 (1.60)	0.00004 (0.02)	0.00371 (1.74)	0.00209 (1.03)
ztropics	-1.42479 (-2.68)*	-1.6175 (-3.00)*	-1.4001 (-2.40)*	-0.6134 (-1.12)	-1.4677 (-2.54)*	0.99646 (-1.81)
bq	0.33245 (2.92)*	0.31598 (2.81)*	0.2931 (2.56)*		0.2919 (2.58)*	0.24247 (2.28)*
elf61			-0.8085 (-1.28)	-1.0542 (-1.66)	-1.1817 (-1.76)	-0.96603 (-1.66)
exp	-3.3175 (-2.31)*	-2.7259 (-1.86)	-2.7087 (-1.74)	-2.2942 (-1.65)	-2.5951 (-1.69)	-3.1909 (-2.22)*

TABLE III
(Continued)

SASIA(=1)					0.6567 (1.52)	
LAMERICA(=1)						-0.97545 (-3.24)*
n	65	65	77	63	63	63
Adjusted R ²	75.09	75.97	76.41	70.19	77.02	80.19

Note: Asterisks indicate statistical significance at the level of $|p|=0.005$ (or $|t|=1.96$). **lngdp65** is the natural log of initial GDP per capita, which is a control variable. **ca1985** is the current account in 1985, as a percentage of total GDP. **n - π** is the net growth of labor force. **landlocked** is a dummy variable which marks landlocked countries as 1. Similarly, **landlneu** also measures the landlocked characteristics, except that it excludes countries in Western and Central Europe. **open6590** is the share of years open. **lifex65** is the life expectancy in 1965. **ztropics** is the proportion of a country's land that is tropical. **bq** stands for bureaucratic quality. **elf61** is Ethnolinguistic Fractionalization in 1961. **exp** is the share of natural-resource exports in GDP in 1970. **SASIA** is a dummy variable including countries in South and Southeast Asia. Similarly, **LAMERICA** is also a dummy variable including countries in Latin America. For detailed description and resources of the data, please refer to **Appendix I**.

Regression Results

Based on the Sachs and Warner model, all the regressions are reasonably robust, with an adjusted R^2 typically around 0.75-0.80 (see Table III). This means that on average, the variables listed are able to explain 75-80 percent of the variation in the dependent variable. Before moving on to each regression, two variables need to be explained. First, the natural log of GDP per capita in 1965 is a control variable, which means that initial GDP per capita is deliberately held constant throughout all the regressions. It is indicated as q on the right hand side of equation (*). Thus for each country i , GDP per capita in 1965 is fixed as variable q_i in (*). As seen in Table III, all the coefficients of GDP per capita in 1965 are negative and significant at level $p=0.005$. This is reasonable since developed countries usually grow more slowly than developing countries. Second, $GDP_{1965} * open_{65-90}$ is a variable calculated by multiplying initial GDP per capita in 1965 and the share of years open from 1965-1990. This variable, according to Sachs and Warner, is used to measure the convergence rate of growth (1997), indicating whether openness facilitates faster growth.

In regression (1), all the variables except life expectancy ($lifex_{65}$) and life expectancy squared ($lifex_{65}^2$) are statistically significant, which means that all the absolute value of t-ratios are larger than 1.96. Specifically, growth rates from 1965-1990 are negatively related to initial income, whether the country is landlocked or not, initial income times openness, proportion of tropical land and the share of natural resource in exports in 1970. In contrast, positive current account, net growth of labor force, trade openness, and good bureaucratic quality would benefit the overall economy. To summarize, elements such as current account, growth of labor force, trade openness, share of tropical land, institutional quality and natural resources appear to impact economic growth significantly, according to the data in Table III. To increase the robustness of the regression, I changed the variable landlocked to $landneu$, which excludes many European countries that are landlocked but wealthy. From the second regression, it is clear that $landneu$ is a more significant measure than landlocked, with an increase in the absolute value of the t-statistic from 2.50 to 2.90. In addition to the previously mentioned advantage, initial GDP, the net

growth of labor force, trade openness and the share of tropical land all enjoy an increase in statistical significance.

I first added ELF61 into regression (3) and the results are mixed. In particular, data show that ELF is negatively related to economic growth but is not significant, contrary to what I expected. In addition, while the adjusted R^2 increases by about one percent, ELF61 seems to decrease the effect of the significant variables except for net growth of labor force. Given that ELF could have an endogenous effect on bureaucratic quality and other variables alike, I excluded the variable bq and constructed a new regression shown in column (4). With the absence of bq , the adjusted R^2 drops to 70.19. Moreover, z tropics and the convergence rate lose significance while many variables have a weaker (but still significant) impact. However, it is worth noticing that ELF61 has a stronger impact after excluding bq , and it became weakly significant at the level of $|p|=0.10$. Specifically, in regression (3), with a one-unit increase in the ELF index, the growth rate decreases by 0.8085: in regression (4), with a one-unit increase in ELF, the growth rate would decrease by 1.05.

Next, in regressions (5) and (6), I added the dummy variables SASIA (all countries in South and Southeast Asia) and LAMERICA (all countries in Latin America), respectively. When adding SASIA, the coefficient of ELF61 becomes more negative while SASIA itself seems to have a positive relationship with economic growth, as the coefficient of SASIA is positive (but not significant). This implies that SASIA has emphasized the negative role of ELF61, but for some reason, countries in South and Southeast Asia somehow grow faster in general, with a positive estimated coefficient. Similarly, LAMERICA also increases the influence of ELF61, as the coefficient of ELF61 became more negative than it did before. However, Latin American countries seem to grow more slowly than average, since the coefficient of LAMERICA is significantly negative.

Interpretations and Discussion

According to the regressions in Table III, two results are particularly intriguing. First, contrary to what I expected, ELF61 is not significantly related to economic growth. Second, ELF61 is somehow endogenously related to bureaucratic quality and possibly to several other variables. Thus, my sense is that ELF61 measures do affect an economy to some degree, but mainly through variables like bureaucratic quality. Because of this endogenous effect, the regression loses robustness when ELF61 and bq are both in the equation. To test my hypothesis, I conducted several separate regressions by treating ELF61 as a single independent variable. The results are presented in Table IV.

TABLE IV
Key Indicators of Institutional Quality and Public Policies
(The Independent Variable is ELF)

Dependent Variable	Constant	ELF61	Number of Observations	R ²
Bureaucratic Quality	4.108 (10.64)*	-2.624 (-3.60)*	79	14.41
Corruption	4.415 (12.35)*	-2.688 (-3.98)*	79	17.08
Rule of Law	3.9948 (10.12)*	-2.4838 (-3.33)*	79	12.61
Revolutions and Coups	0.1133 (2.46)*	0.2099 (2.53)*	109	5.64
Share of Years of Openness (1965-1990)	0.563 (7.65)*	-0.5383 (-4.09)*	112	13.18

Note: t-statistics are in parentheses. Asterisks indicate statistical significance at the level of $|p|=0.005$ (or $|t|=1.96$). For data description and sources, please refer to **Appendix I**.

The results in Table IV prove my prediction, since all the coefficients are significant. To explain in detail, more ethnically fractionalized societies will have lower bureaucratic quality, higher levels of corruption, less effective rule of law, more revolutions and coups, and fewer years of openness. Since the corruption and the rule of law indices are such that the lower the indices the worse the situation, the negative coefficients of ELF61 indicate that the more ethnic-diverse a country is the higher the indices

and the worse the political structure in terms of corruption and rule of law. To sum up, the coefficients of ELF61 are all significantly related to indicators of institutional quality and public policies. Therefore, although ethnolinguistic fractionalization does not affect economic growth directly, it seems to impact the economy indirectly through institutional quality and public policies, as hinted by the theories in Chapter

Generally, the overall outcome of the empirical study is quite puzzling. Despite a strong correlation between ELF and economic growth (as suggested by a number of theories), the economic result in Table III verified no obvious correlation. In particular, ethnolinguistic fractionalization impacts the growth rate ambiguously, with no significance in any of the four regressions. The evidence indicates at least two possible implications. First, ethnic diversity might not be a real causal factor, despite of what many theories have suggested. Ethnolinguistic fractionalization might be a condition for a country's economic failure, but it nevertheless is not a major player in a country's economic growth, especially in the long run. My second conjecture is that ELF might be an important factor in economic growth, but its impact is undermined in the statistical test because of its interaction with many other variables in the equation. Given the results in Table IV, it can be inferred that ELF is statistically related to Bureaucratic Quality and Share of Years Open. There might be some endogenous effects among those three variables that ultimately counteracted the impact of ELF. In addition to the weakness of ELF on the overall economy, my hypothesis of geography being an important factor also failed to be verified. In fact, being in a particular region does not have any perceptible impact on how ethnicity would impact a country's economy. The results from SASIA and LAMERICA are so mixed that my hypothesis has become inconclusive.

However, correlations between ELF and some indicators of public policies have been confirmed, according to the data in Table VI. Although the R^2 s are low, the high values of t-statistics have pointed to some levels of relativity between ELF and government policies. Perhaps ethnic diversity has caused some countries to induce some harsh policies that made its citizens worse off. Maybe bad policies irritated

some ethnic groups and caused conflicts to break off, which then crumbled their economies. The exact role of ELF remains to be examined in the case studies in the next chapter.

Before moving on to the next section, I wish to address a matter regarding the regressions presented in Tables III and IV. The model presented by Sachs and Warner treats institutional quality (i.e., bureaucratic quality) as an exogenous variable. However, it seems that a troubled economy would also bring down a weak yet democratic government and invite an authoritative institution. For example, it was almost the depressed economy that enabled the Nazis to seize power in pre-WWII Germany. Because the preceding government (a democratic parliament) could not solve the problems left by WWI, and with the occurrence of the Great Depression, the German people chose Hitler who seemed to be a powerful and promising leader for their future. Unfortunately, the authoritative government was no better at resolving the difficulties of the country, given that Germany was defeated and the country fell into turmoil after the war. Therefore, while an effective government could facilitate economic growth, it may well be affected by the economy at the same time. This observation suggests that the exogenous feature of institutional quality is more or less questionable. In fact, all the variables—except for geographic data and resource endowments—are essentially endogenous: a bad economy could transform a country to a non-saver, or a serious recession could lead a government to embrace protectionism and deteriorate terms of trade. As a result, the assumption that some variables in the Sachs and Warner model (e.g., institutional quality and central government budget balance) are exogenous needs further investigation in the future.

Chapter 3

Affirmative Action in South and Southeast Asia

In this chapter, I intend to depict the role of ethnic diversity in the real world. In particular, I focus on an important public policy that targets ethnic issues—affirmative action—in several Asian countries. I begin with an overview of the policy structure and its overall effects in those countries. In the following sections, I discuss the details of policies in India, Malaysia, and Sri Lanka separately while including a brief description of the policy in Singapore. More importantly, I analyze the benefits and drawbacks of the policies for each country, as well as analyzing whether they are efficient or not. By the end of the chapter, it may be seen that well-intended policies do not always produce optimal results. In fact, a policy that initially seems sound may prove to be inappropriate in many other aspects and, as seen in Sri Lanka, might result in one of the worst tragedies in human history.

Overview

In general, South and Southeast Asian countries are very ethnically-diverse. Other than in Thailand and Cambodia, in the countries of South and Southeast Asia ethnic minorities represent more than 10 percent of the total population, with the highest being 50 percent (Clarke, 2001). As shown in Chapters 1 and 2, countries with more ethnic diversity are prone to be engaged in conflicts of interest and bad public policies. When all parties struggle to grab their share, the pool of resources is tend to be exhausted, consequently leaving less capital for societies to develop. Moreover, when advantaged groups seize more resources, a sense of unfairness and resentment will arise from less advantaged groups. Heightened ethnic tensions are likely to bring about ethnic conflicts or even civil war. This is not unusual. In fact, this is where most affirmative action begins.

The justifications for affirmative action are usually threefold: to compensate for the past wrongs that were acted on the disadvantaged groups; to correct the ongoing discrimination which was resulted from past endeavors and to shield discriminated people from further damage; and to comply with moral traditions (Tierno, 2007). The first theoretical basis arises from a situation where there are two equally qualified people, identical in every way except for their ethnic/racial traits. Assuming they do not face any

other discrimination, it is still likely that the person from the disadvantaged group would achieve a lower social status than the other person. Possible reasons range from weak business/social ties necessary for the person to succeed to an inherently low level of human capital invested as a result of insufficient family support.

Affirmative action is also indispensable, according to the second argument, because it is a must to debar the continuation of discrimination in the present day. According to the Bayes Theorem (Coate and Loury, 1993), groups with lower priors (i.e., the proportion of qualified people was projected low) will have lower posterior (i.e., turn out to have fewer qualified people) than advantaged groups. Therefore, a person with disadvantaged background is more likely to be discriminated against, no matter how qualified he or she actually is. Since no one is irrational or morally wrong in this situation (Coate and Loury, 1993), only through forceful intervention can this vicious cycle be terminated.

The final rationale for affirmative action is simple. Grown out of humanity and morality, the notion of justice and equality impels prevention of further discrimination (Tierno, 2007). Everyone deserves justice and equal treatment, and no one should be discriminated against for things that are not his or her fault. As a minor argument, promoting national unity is also a valid support for affirmative action (Tierney, 1997). Therefore, for the above reasons, affirmative actions were enacted to extend particular benefits to these groups or to establish discrete standards for them. The policies often take the form of numerical concepts, usually seen as “goals” or “quotas,” in the hope of addressing the results of the program directly.

The scope of the affirmative action varies, depending on the country. In India, the policies apply to about half of the total population, and the number is still growing (Zwart, 2000). In Malaysia and Sri Lanka, the affirmative action policies aim at specific ethnic groups—the Malays in Malaysia, and the Sinhalese population in Sri Lanka. By means of quotas and other preferential treatments, governmental posts are reserved and allotments are offered for admission to major universities. Consequently, conditions have improved for the members of the targeted groups in that their numbers have increased dramatically, and their living standards have greatly improved since the affirmative action plans were

implemented. A number of papers claim that in Malaysia, the income and employment level of the Malays increased significantly within fifteen years of the implementation of affirmative action (Klitggard and Katz, 1983). Statistics also imply that due to affirmative action policies in universities, the number of Malay doctors increased to 28 percent of total in 2000, compared to 4 percent in 1970 (Sowell, 2004). In India, affirmative action has forbidden open discrimination against the untouchables, which was a social norm before the law's enactment. While the number of college graduates from the untouchable caste was negligible prior to affirmative action, outstanding scholars, engineers and doctors from the former untouchables are not uncommon now.

Nevertheless, problems arise with the implementation of affirmative action. One common problem is that whether these policies apply to one preferred group or to several targeted groups, there seem to be immense disparities in the benefits received by each individual within the group. In other words, within the preferred groups, "less backward" groups are likely to grab larger share of the pie than the "more backward" ones within the category defined by the affirmative action (Sowell, 2004). This is the case in India where advantaged groups within a particular targeted population were able to seize the opportunity to move up the social ladder. Those groups are often called the "creamy layer." In Malaysia, Malays with a better family background were able to obtain more wealth and receive more professional education than those at the social bottom (Sowell, 2004).

In addition, when the country proactively supports particular groups, a situation of reverse discrimination often arises. In this context, the problems with affirmative action lie with the non-preferred groups. If the affirmative action is particularly aggressive, it is very likely that the non-preferred population will become dissatisfied and resentful towards the preferred groups. Since affirmative action enables some ethnic groups to obtain certain jobs and benefits with much less effort, it is not uncommon that opportunities for non-preferred groups would be "crowded out." This creates disincentives for previously advantaged groups to exert themselves, or even remain in the country. This happened in Malaysia where several trillion dollars of capital was transferred overseas following the enactment of

affirmative action in the 1970s. In addition, since the policy also creates a disincentive for the preferred groups to work hard, the overall social welfare decreases as both groups contribute less (Sowell, 2004).

Furthermore, the current policies involve a certain degree of inefficiency, in that the reserved benefits are often under-utilized. In India, allocations for the targeted classes in the national engineering universities were often unfulfilled, possibly due to insufficient knowledge of those the program was supposed to help. (Sowell,2004). Similar situations have been observed in other countries.

Though the aim of affirmative action is providing greater equality to all ethnic groups and promoting social welfare overall, the outcomes of the policy are somewhat questionable. In some cases affirmative action seems to exacerbate the situation. In India, mass conflicts and violence occurred in cities including Andhra Pradesh, Assam, and Maharashtra as a direct result of the affirmative action. Notably, these conflicts do not include social discrimination and conflict with those previously known as “untouchables,” who are deemed inferior by people in other classes. The tragedy of Sri Lanka (i.e., the stagnated economy partially due to a civil war caused by ethnic tensions) best exemplifies a negative impact of affirmative action. As a matter of fact, Sri Lanka was perceived as the “best bet of Asia” for investors and businessmen at the time of its independence (Kelegama, 2000). Fifty years later, partially due to affirmative action, the country suffers from a significantly lower average income than that of other Asian countries, with ethnic conflicts and civil war haunting its heart.

In addition, virtually all the affirmative actions were launched as temporary policies to help out the people at the bottom of society in those countries (Sowell, 2004). More than half a century later, there is no trace of an exit plan in any of those countries, however. There is no doubt that affirmative action is essential in providing equality to a country’s people; particularly in assisting people who could not attain better social status by their own. Nevertheless, there are certain problems and defects that need attention. In the next three sections, I attempt to analyze the affirmative actions in India, Malaysia, Singapore, and Sri Lanka. Specifically, the economic, social and political ramifications of affirmative action will be examined.



Figure 1. Map of South and Southeast Asia Source: <http://www.mapsofworld.com/south-asia-political-map.htm>

India

Ethnic Background

India's ethnic diversity stems from its caste system which reaches back 3000 years. With the mingling of Aryan people and the indigenous people in the Indian Peninsula, Hinduism rose as a major religion in India to integrate the society and, more importantly, to offer spiritual salvation. According to the religious scriptures, Hindu society was divided into four (later five) distinct Varnas (i.e., castes) based on mutual exclusivity, hereditaries, endogamy, and occupation. There were the Brahmins (teachers and priests), Kshatriyas (warriors), Vaisyas (businessmen, farmers, etc.), and the Sudras (servers and other menials). At the bottom of these four castes, were the AtiSudras, or untouchables (those who do the lowest of the menial jobs) who were considered excluded from Hindu society (Deshpande, 2000).

The caste system was very hierarchical, with the first three strata considered superior to the latter two. The system became more complex with the creation of jatis (smaller castes) within each Varna.

Nevertheless, the Hindu caste system was not inflexible: a person might move from a lower caste to a higher caste by his/her hard work or by doing good deeds. A person might also move up to a higher caste by accumulating good behaviors and be reborn as a member of a higher Varna in the spirit of Karma.

It is believed that caste system was rigidified during the colonial period under British Rule (Sowell, 2004). In fact, it became the foundation of political and social governance of India under the “divide and rule” principle of the British Empire. This was probably because ruling through an existing system was much less expensive than establishing a new Western model for society. When the caste distinctions became reinforced, the social restrictions against the untouchables turned to social norms, and the untouchables were stigmatized. The untouchables, as the title implies, were people not to be touched. They were supposed to refrain from contact with people from other castes, and there was severe punishment for any violation. It is said that the untouchables were not allowed to let their shadow fall upon a caste Hindu, and they had to beat drums when they were entering a village to warn others to keep their distance (Aggarwal and Ashraf, 1976). The untouchables were not allowed to draw water from the well reserved for other castes. In one incident, an untouchable girl who drew water from the well used by other castes had her ears cut off. In another place where untouchables were allowed to share wells with others, a riot was set off because an untouchable woman put her pot on a pot owned by a caste women (Sowell,2004). It is worth mentioning that these two episodes happened in the late 1970s, decades after the enactment of affirmative action.

The untouchable caste has become stigmatized by a long history of discrimination and segregation. Because of their lack of education, many untouchables were unable to improve their living conditions and social status. While the untouchables clearly needed help, many people were reluctant to support this thought. Even Gandhi, the preeminent leader of civil rights movements, expressed his concern about the untouchables becoming part of the Hindu electorate. Thus, when the British created a special electorate for the untouchables in 1932, Gandhi threatened to starve himself to death unless the decision were reversed (Sowell, 2004).

Many people from Indian tribes and backward castes suffered from social discrimination and economic desperation throughout the practice of the Varna system, along with the untouchables. When India finally won independence from Great Britain in 1947, it was more than obvious that the caste system hindered the overall development of the Indian society and the system was abolished in 1949. Further, to prescribe equal treatment for all individuals, especially those who were previously discriminated against, affirmative action was included as a part of the constitution. The law was established as a means to provide a series of explicit exception policies to help various disadvantaged and targeted groups. Since the law was intended to compensate for past wrongs, the policies are often referred as “positive discrimination.”

“Positive Discrimination”

Since the caste system in India was as complicated as one could imagine, details must be elucidated about what specific segments of the population received special treatment. When the law was first enacted, affirmative action included the Scheduled Castes (SC’s)—that is, the former untouchable castes—and the Scheduled Tribes (ST’s), those tribes that were socially and economically marginalized. SC’s and ST’s together accounted for nearly 20 percent of the Indian population (Deshpande, 2000). Later, in 1953, the constitution was amended to entitle the Other Backward Classes (BC’s) to affirmative action. The BC’s are the economically and socially backward classes and very similar to the Scheduled Castes. Basically the BC’s include all the socially and economically disadvantaged groups in other castes. Hence the BC’s, or the Other, is a very large and heterogeneous category that accounts for nearly half of the population (Zwart, 2000). Records indicate that the Other includes at least 3,000 castes overall, and keeps growing in size.

Articles 14 and 16 of the Indian constitution established the general right of equality and the special considerations extended to the targeted groups (Chandola, 1988, pp.106-108):

The State shall not deny to any person equality before the law or the equal protection of the laws within the territory of India...Nothing in this article shall prevent the State from making any provision for the reservation of appointments or posts in favour of any backward class of citizens which, in the opinion of the state, is not adequately represented in the services under the State...The claims of the members of the scheduled Castes and the Scheduled Tribes shall be

taken in to consideration, consistently with the maintenance of efficiency of administration, in the making of appointments to services and posts in connection with the affairs of the Union or of a State.

As a response to the constitutional law, access to government jobs and education is reserved for all the targeted groups (SC's, ST's and BC's). Companies having a contract with the government must reserve a portion of their jobs (as much as 50 percent of the total) for the targeted groups. In addition, housing subsidies in various forms, health programs, maternity and other benefits are also provided through affirmative action to the previously disadvantaged groups.

Years after the abolishment of the caste system and the implementation of affirmative action, some evidence has shown that the policy has been successful in targeting the financially disadvantaged and helping these people to improve their lives (Bentrand et al., 2010). Other surveys (Sowell, 2004) have shown that the social convention of castes has virtually disappeared in urban areas in India. However, many problems have emerged during the past fifty years, and a number of them have profound implications and should serve as a caution to other countries.

Problems

1) Inadequate Support, the Discouragement Effect, and Mismatched Skills

One of the most criticized aspects of the policy is that the targeted groups have not gained as much as had been expected. Specifically, many of the quotas and benefits go unused due to the lack of awareness (or information) of the disadvantaged castes. Many of the SC's, ST's and BC's do not take advantage of the opportunities to which they are entitled. Moreover, even if they are aware of the opportunities, many do not use the quotas and admits because the subsidies are not sufficient to provide for their education. For most students from targeted groups, the scholarships amount to no more than "pocket money" and only those with other financial resources can continue along the road (Sowell, 2004). Since the subsidies barely cover the majority of education expenditures, many students from the SC's and ST's are still unable to afford their tuition and will probably end up in the same menial jobs as did their parents.

While financial difficulties are one obstacle to affirmative action being effective, more serious problems lie in the mismatch of qualifications and skills. It is true that about half of the government jobs and university admissions (especially the prestigious ones) are reserved for the backward castes, but many of them are simply unable to do the job or complete their degree because of insufficient skills and abilities. For example, a professor of forensic medicine at Bombay's Topiwala National Medical College confesses that while students usually need to score above 90 percent on the entrance exam to be accepted to the college, applicants in the reserved category only need to score over 75 percent (*Journal de l'Association Médicale Canadienne (JAMC)*, 2002). The explicitly lower cut-off enables much less prepared students to get in, and the real problem emerges only after they are accepted. The professor said that some reserved-category students are simply incapable of completing the course. While she already tended to treat these students less rigorously than others, further leniency on grade evaluation was not allowed due to the unfairness to open-category students (*JAMC*, 2002). Moreover, when the professor suggested additional help for the reserved-category students, it was rejected because these students considered the help as "another form of segregation" (*JAMC*, 2002, pp.166).

In fact, many scholars refer to the phenomenon as the "discouragement effect." Since the restricted-category students are so unprepared prior to the college, many of them cannot complete their college education and, as a result, drop out. In this instance, affirmative action has definitely made the minorities worse off because the time spent in college could have been used in other financial pursuits. The time and effort spent in college is completely wasted if the students cannot obtain useful skills and therefore find themselves in menial job positions. Consequently, many of the quotas in higher education are unfilled and the used quotas cause great inefficiency through the discouragement effect. The same is true in the job market. Although posts are reserved in most good firms and in government, many of the reserves are wasted since few in the reserved category have the required qualifications. Thus, many untouchables are still concentrated in the bottom jobs in India (Sowell, 2004).

2) The “Creamy Layer”

Affirmative action has disproportionately benefited a small group of people within each caste. This problem is particularly relevant to the Other caste. While members are much more equal within the SC’s (the untouchables) and ST’s (tribe people), the inter-group disparity is much sharper in the BC’s (the Other Backward Castes) (Deshpande, 2000). The small group that takes advantages of the quotas and benefits reserved to that caste is usually relatively better off than others in the caste, and some are wealthier than certain people of superior castes. These more advantaged people are dubbed the “creamy layer” because of the benefits concentrated in their hands. The affirmative action policies have enabled the “creamy layer” to usurp the quotas of the disadvantaged people in the same caste, causing more inefficiencies than ever.

In the Indian state of Tamil Nadu, while the more advantaged and the less fortunate are about equal in number, the more advantaged received about fifty percent more scholarships than did the less advantaged groups (Sowell, 2004). In a paper examining the patterns of admissions to prestigious engineering universities (Bentrand et al., 2010), results showed that the minority households which were able to take advantage of the opportunities brought about by affirmative action programs were much better off than the typical minority household. Specifically, within the same groups, higher-income families are much more likely able to send their children to a better school than are the lower-income families. Since the advantaged have the financial and intellectual means to bring better pre-college education to their kids, the quotas have just made it easier for them to get into good colleges.

Due to this “creamy layer” effect, “quota within quota,” or individual eligibility, was requested to balance the actions of the more advantaged. However, this created another problem: how to determine the “most backward caste” within each broad category. Solving this issue brought about more chaos due to the inherent weakness in defining the Other Backward Castes. While the concept of untouchables and tribes is obvious and definite, the definition of the “Other Backward Castes” is not. The construction of BC’s only began after the first enactment of the affirmative action law, and it was aimed at helping the

socially and educationally backward classes (Zwart, 2000). The problem arose from the fact that the commissions believed that the caste system is the most obvious and “convenient” criterion for categorizing these people, thus the beneficiaries automatically turned to “caste members.” Because of the variety of social and financial strata within the castes and classes, the definition of the “backward castes” became extremely vague.

Therefore, it is not surprising to see that many sub-castes were “created” in order to distribute the benefits. When in 1953 the Backward Classes Commission first conducted surveys, 2,399 castes became eligible to belong to the Other Backward Classes and receive affirmative action. However, when the second commission conducted surveys again in 1979, there were 3,743 groups listed (Zwart, 2000). According to Zwart (2000), the additional castes were justified on the basis of history and sociology of India, rather than on improvements to the investigation’s methodology. While people within a caste are already contentious, arguing as to which is the “more backward,” the ever-growing number of backward castes will create a further burden to national budgets. More importantly, by refining the categories of BC’s, the social distinction based on the caste system only becomes more stratified. In other words, affirmative action has reinforced the caste system instead of weakening it.

The “creamy layer” effect certainly caused a sense of unfairness within each caste. However, when trying to target the right groups by individual eligibility, the question of “the more backward” has baffled everyone. With the presence of more than 3,000 castes, it is a huge endeavor to decide which are the more backward, not to mention the determination of who are the less fortunate within each group. The effort to apply the “quota within quota” to the whole population may just be too much, while its effect on improving the “creamy layer” situation remains indeterminate.

3) The Cost to the Upper Castes and The Sacrifice of Society

The effects of affirmative action on the upper castes are ambiguous. Some suggest that there has been a close-to-zero effect on those people because the most advantaged groups have always had privileged access to education, government and business (Sowell, 2004). Others argue that the “positive

discrimination” has crowded out some benefits of the upper castes, and has caused bitterness and resentment among these groups of people. In either situation, the actual losses to a particular group are hard to evaluate, since no one can be sure of how many benefits would have been retained by members of the upper castes had affirmative action not been introduced.

Although the cost to the upper castes is indeterminate, the societal cost of the affirmative action program is likely to be absolute. Bertrand et. al. (2010) pointed out that income losses experienced by displaced upper-caste university applicants are larger than the income gains enjoyed by the lower-caste applicants who displaced them. This has created an “absolute cost” to the society. Similarly, firms that are mandated to hold quotas also experience a loss by hiring someone with less qualifications than would be the case were they able to hire based on qualification and merit. However, even though reserved-castes members sometimes admit that the rival group is better qualified, rights and equality seem to be of more importance to them. One of the leaders in the backward castes even made the comments that some inefficiencies are necessary for their people to get jobs (Sowell, 2004). As the affirmative action program keeps expanding at the expense of certain ethnic groups, questions arise as to whether the policy is still affordable to the Indian society.

Policies overladen with preferential treatment can ignite resentment and violence. In most places in India where ethnic tensions persist, outbreaks are often caused by a long history of resentment due to preferential treatment and language conflicts. In the state of Assam, the Assamese and the Bengalis fought over the right to use an exclusive language in order to attain the preferential treatment reserved for only the Assamese. To protect the benefits already given to themselves, the Assamese conducted a series of riots, arson, and looting in order to consolidate their status. The atrocities escalated in a 1983 uprising during which the Assamese and a number of local tribes attacked and killed 4,000 Bengalis, leaving more than one million people homeless (Weiner, 1983). Similar turmoil has appeared in other cities like Bombay (now Mumbai) where two ethnic groups fought consistently in order to attain the reserved benefits under the affirmative action programs (Sowell, 2004).

What the income losses were that resulted from affirmative action implementation is hard to measure but the overall welfare of a society is severely damaged if ethnic conflicts are caused by the policy. While those in the reserved-category see the preferential treatments as “necessary,” those not in the category perceive the policy as unfair. Moreover, the situation is exacerbated when groups fight with each other in order to gain their share of the pie. Unless outside forces intervene, the conflicts are not likely to stop until one side is completely suppressed.

Summary and Discussion

The affirmative action plan in India was one of the earliest such programs in the world. The policies cover more than half of the Indian population and they keep expanding. The case in India is particularly intriguing due to the extent of the program, and due to the political implications developing over the past fifty years.

Although some equality has been achieved, the results are far from satisfactory. “Positive discrimination” suffers from insufficient compensation to the targeted groups and has made a number of minorities worse off. The policies also have defects in matching the qualifications of the reserve-category people to the requirements of reserved jobs. In addition, most of the benefits are concentrated in the “creamy layer,” or among the more advantaged people within a caste, sharpening disparities within each caste group. More importantly, the program has had a huge social cost due to the damages brought by ethnic conflicts.

Nevertheless, it is impossible to assert that India would have been better without the implementation of an affirmative action plan. Despite the studies and criticisms of “positive discrimination”, the social status and living conditions have improved mildly for the SC’s and ST’s (Kurmar, 1992). Numbers do not tell everything, but they do reveal some important facts. Prior to affirmative action, the targeted groups constituted more than 50 percent of the population while they represented less than 5 percent of all higher-level positions in the government (Kurmar, 1992). Since the enactment of affirmative action, the national universities and the government are required to include a portion of disadvantaged groups that is equal to the group’s true proportion in the overall population.

Affirmative action in India, despite its controversies and problems, has at least forbidden open discrimination and exclusion against the disadvantaged. Equivalently, “positive discrimination” has offered the previously discriminated a possibility, a perceptible dream. Because of the inherent obstruction within caste norms in Indian society, most of the SC’s and ST’s (without the enforcement of affirmative action) would probably have ended up in the same menial environment as their ancestors were a thousand years ago. Therefore, affirmative action as a whole has likely influenced India positively through assisting people from the very bottom of the society. Though ethnic conflicts are still present and the policies are not 100% effective, it seems that things would have been worse if the “untouchables” were not assisted, given that more intense conflicts could have taken place as a result.

Its ethnic composition and cultural heritage put India in a difficult situation in the first place. The situation was met bravely with affirmative action programs on a scale almost incomparable to other similar policies in the world. The outcomes are mixed, possibly due to certain details of the policies. However, these difficulties are common, though in different degree, to virtually all affirmative action policies around the world. Although India’s “positive discrimination” still has a long way to go, its experiences and outcomes offer invaluable insights for the rest of the world.

Malaysia

Ethnic Background

When compared to the ethnic composition of India, that of Malaysia is much less complicated. The largest ethnic groups in Malaysia are the Malays and the ethnic Chinese. There are also indigenous peoples who, along with the Malays, are called the Bumiputeras, or “sons of the soil.” The Bumiputeras make up about 60 percent of the total population; it is they who receive preferential treatment from the government. The ethnic Chinese, together with a small number of Indian minorities, comprise the rest of the Malaysian population.

The ethnic Chinese were brought into Malaysia by the British during the colonial period. The Chinese immigrants (and some Indians) were chiefly indentured laborers, providing cheap labor for the British tin-mining business (Abdullah, 1997). These Chinese were mostly poor and illiterate, doing hard and dirty jobs, and most of the indigenous people despised them. Although the Chinese started at the bottom of the economic ladder when they first came to Malaysia, their diligence and their ability to work closely with British businessmen enabled them to start small retail businesses. While most of the Chinese who immigrated in 1911 were laborers, only 11 percent were in the same occupation twenty years later. In fact, the Chinese were able to succeed in large business ventures, and just five decades later, most domestically owned corporate equity was held by the ethnic Chinese (Sowell, 2004).

While the Chinese started at a lower economic position than the Bumiputeras, they were able to achieve a much more comfortable life within several decades. The economic success of the Chinese caused resentment among the Malay population. While the Malays already enjoyed preferential treatment under the British Rule, they decided that this was not enough. Once the country gained its independence in 1957, the constitutional law buttressed the political supremacy of the indigenous Malays. While the Chinese were demanding equal rights as citizens, the Malays wanted to consolidate their political power to ensure their supremacy over all. However, their desire to prosper remained political and the Malays failed to succeed in business sectors. The ethnic Chinese continue to outperform the Malays economically and educationally. The racial disparity between the two can be summarized as follows:

To witness the wealth of the Chinese before 1969 (i.e. before the famous racial riots), one needed only to observe the following: Drive along the main housing developments around Kuala Lumpur and see who owned them? Look at the shops in the big cities...or visit offices of any large modern enterprises and see to whom they belong? Examine the ethnic composition of the faculty and students of the University of Malaya (prior to 1970) and see who forms the majority? The answer would be either Chinese or other non-Malay groups (Yusuff, 1992, p.7).

On the other hand, the situation of the Malays was disappointing:

To observe this, one only needs to travel to the rural areas and see the standard of living and life style of the Malays. The contrast with the Chinese was overwhelming. While many Malays were living below the subsistence level, the great majority of the Chinese and Indians were able to have motor scooters, transistor radios, and even cars and televisions. These economic imbalances cause grievances among the Malays and in turn fuelled communal tensions. (Yusuff, 1992, p.7)

The ethnic tensions persisted as the economic distinctions became sharper. The tension was relieved somewhat when Singapore, with a concentration of ethnic Chinese, was expelled from Malaysia in 1965. However, the story was not over. Ethnic conflicts broke out after the Chinese won a close victory in the elections of 1969, and Chinese people began celebrating in the streets. The angry Malays attacked and killed hundreds of them (Sowell, 2004). In order to mollify the Malay population and to “promote the unity” of the country (Abdullah, 1997), an affirmative action program called the “New Economic Policy” (NEP), and later the National Development Policy, was enacted to prescribe quotas and other preferential treatments of the indigenous Bumiputeras.

The New Economic Policy (NEP)

The NEP was launched in 1971 in the name of forging “national unity”(Abdullah, 1997). The policy consists of two major programs. The first was aimed at reducing and eventually eradicating poverty levels and at increasing job opportunities for all Malaysians. The second was aimed at restructuring Malaysian society to “correct economic imbalances” to reduce and eventually eliminate the identification of race with economic functions (Abdullah, 1997). The NEP aimed at promoting the wellness of the Bumiputeras by offering and insuring quotas and benefits in sectors other than the government. In general, the NEP was designed to turn over a large portion of the results of new economic growth to the Bumiputeras.

Specifically, a series of policies were formally (and informally) announced to help the Bumiputeras. In the business sector, a portion of the positions in private companies, including ones in foreign firms, are reserved for the Bumiputeras under the NEP. The major policy emphasized “the implementation of a forty percent Malay employment quota in all commercial firms” (Klitgaard and Katz, 1983, p. 337). New businesses could be started only if they had at least 30 percent Malay participation. Efforts were made to provide credit and technical support to small businessmen, primarily Malay. Loans were made so easily available to the Malays that the Malays felt that those “loans do not have to be (Sowell 2004, p. 62). Moreover, in order to increase the Malay share of business ownership, the

government relied on large public organizations to facilitate this goal. Highly profitable businesses were sold only to Malays. The ultimate goal was to boost the Malay share of the total business ownership to thirty percent by 1990 (Klitgaard and Katz).

The NEP also expanded the preference for the Malays in education. Several changes were attempted, one of the most dramatic reforms was the conversion of English-language public schools to Malay-language schools, a process begun in 1970. This language reform made it difficult for the ethnic Chinese and Indians to continue their education since all the standard exams were suddenly written in Malay. After the reform, the significantly worse performances of the Chinese and Indian students than before, along with the good grades of the Malay students in contrast, seem to suggest that the language change had made it a barrier for the non-Malays to benefit from the public education.

Moreover, university admissions were no longer based on solely academic performance, and ethnic preference in the form of financial aid became an important part of the policy (Klitgaard and Katz, 1983). As a result, the Chinese and the Indian minorities generally found it more difficult to attend public schools, and they had more difficulty getting into the universities. In addition, university admissions were eased for Malays according to special policies and score cut-offs. As a result, thousands of Chinese and Indian students left the country to attend schools in nearby Singapore where the official language was English. Many of them never returned.

Certain results show that the implementation of the NEP policies was successful in addressing the difficulties of the Bumiputeras. The average monthly income of the Malays increased from \$172 in 1970 to \$309 in 1979 (Sowell, 2004). The proportion of Bumiputera students increased dramatically in the five Malaysian national universities. While 99 percent of all government jobs were secured by Malays, the number of Bumiputeras in professional jobs (i.e., engineers, lawyers, doctors, etc.) rose from merely 4.9 percent to 25.1 percent of total professionals (Sowell). After the launch of the NEP, Malaysia enjoyed decades of prosperous growth at a rate of about 7 percent per year. Many attributed the growth to the NEP and the resulting decreased disparities between races (Kennedy, 2002).

Though evidence was abundant in proving the success of the NEP in increasing the economic power of the Bumiputeras, the overall gain to society has been questionable. While the NEP did expand educational and business opportunities to the Malays, it created a problem of disincentives for both the Chinese and the Malays. It also has been argued that the affirmative action program was futile in narrowing the income gap between ethnic groups. The Chinese were able to tolerate the biased policy only because of the overall growth of the economy during the contentious period.

Problems

It is noteworthy that the NEP was implemented over years when the general economic situation was favorable. Both the Malays and the Chinese were able to enjoy an absolute increase in their incomes. Data indicates that the Malays' increase in income was not as dramatic as one might have expected (Sowell, 2004). In fact, the percentage increase for the Malays in respect to that for the Chinese may be explained largely by the urban-rural transformation commonly seen in many developing countries. From a broader perspective, the effect of the NEP policy is close to nil, since each race's proportional contribution to the economy has barely shifted. In other words, the inter-group disparity has remained almost unchanged.

Even in the professional arena of which the NEP commission was so proud, the Bumiputeras remained underrepresented in some high-tech professions, specifically those where academic ability proved too overwhelming for Bumiputera students. Similarly, the Chinese and Indians remained in the majority within the engineering and science departments of major universities. This was a result of the superior examination scores of non-Malay students and the relatively loose ethnic-quota requirements for technical jobs (Klitgaard and Katz, 1983).

Furthermore, the preferential treatment in education has created an incentive problem for both the Malays and the Chinese. Since access to higher education is no longer based solely on academic achievement, status as a Bumiputera would grant many Malay students easy acceptance to the The effort to shield the Malays from competition has made Malay children less willing to exert effort in their studies. In addition, since most of their jobs are also secured after graduation, further effort seems

unnecessary. Evidence has shown that one decade after the NEP program took effect, the quality of higher education in Malaysia has declined significantly (Klitgaard and Katz, 1983). The disincentive effect is more evident in the government, where only the Malays could be employed. This “easy rich” or “easy power” has made many Malays reluctant to exert any effort to complete their governmental duties. It is common for a project assigned to a Malay agent to be sold to second, third or even fourth parties for completion (Sowell, 2004). In 2002, even Malaysia’s prime minister loathed this phenomenon, stating that “the Bumiputeras are not serious in completing government projects...and nearly 85 percent of the projects have not been completed” (*The Straits Times*, 2002, p.14).

The NEP has also generated disincentives for the Chinese and other non-Malay minorities. Although serious racial conflicts virtually disappeared after the implementation of the NEP, the tolerance of the Chinese is more likely the result of the comfortable economic situation rather than the affirmative action. The unfavorable (sometimes even harsh) treatment of the Chinese has already caused many of them to leave the country, taking along their money. Following the NEP, according to Gomez (1999), there was a “marked slump” (p. 70) in the foreign and domestic investments of virtually all the Malaysian sectors except for the oil industry, and it was suspected that the new business guidelines had encouraged huge amount of capital flight. Gomez estimated that between 1976 and 1985, around \$12 billion in capital left Malaysia, at least half of it Chinese. The significantly lower investment in the country than before suggests, at least in the short-run, a negative impact on the Malaysian economy. The likelihood of this increasing loss is significant since evidence indicates that many prominent Chinese entrepreneurs left the country as a result of the new regulations (Gomez, 1999).

Another problem of the NEP is one also seen in the Indian context: the “creamy layer” effect. Since preferential quotas and benefits could more easily be seized by Malay families who already had strong political and business connections, affirmative action simply made it easier for them to grab a larger share of the pie. For example, most politicians in the dominant political parties (such as the United Malays National Organization) have their own enterprises. Once the NEP was implemented, the preferential policy essentially made their businesses “instant wealth” (Crouch, 1996). A similar situation

can be seen in nearly every aspect of the NEP program. Perhaps, unlike in India, the “creamy layer” in Malaysia faces fewer objections because there are fewer ethnic groups. With less diversity in a society, the urgency to secure one’s own benefits may be less pressing when the overall advantage of one’s ethnic group is immense compared to that of other groups.

The Singapore Exception

The situation in Singapore is of interest because, similar to Malaysia, the largest two ethnic groups in Singapore are also the Chinese and the Malays. The ethnic Chinese make up about 80 percent of the population, while the Malays account for 15 percent (Sowell, 2004). More important, as seen in Malaysia, the Chinese and the Malays remain two very distinct groups. They speak different languages at home, and the interethnic-marriage rate is low—about 5-6 percent of total population (Lee, 1988). However, Singapore became one of the most prosperous countries in Asia, with a per capita income five times of that of the Malaysia (Sowell, 2004). All this was accomplished virtually without affirmative action.

Singapore was expelled from Malaysia in 1965 because of its heavily-concentrated Chinese population. After the break-away, Singapore retained English as the official language. Meanwhile, the country sought to promote a generic identity for all racial groups. Aside from minimal aid to the poor and the disabled, Singapore did not extend preferential treatment to any particular ethnic group. As in Malaysia, the Malays in Singapore were outperformed by the Chinese, yet large-scale discontent was rare. Some Malay parents even expressed their preference for Chinese neighbors and for schools with more Chinese children. These Malays said that they hoped their children could learn “good habits” from the Chinese kids (Li, 1989).

It is interesting to see that although Singapore did not provide any preferential treatment for the formerly disadvantaged, different ethnic groups could still live in harmony and prosper together. Singapore followed a dramatically different policy compared to that of Malaysia and was able to achieve greater growth. In 2001, the prime minister of Singapore pointed out that the Malays in Singapore were better off economically than the Malays in Malaysia. More Malays in Singapore were able to achieve a

higher education without the quality of the universities declining (Sowell, 2004). It is apparent that for some reason, Malays without the support of the affirmative action did better than the ones with artificial advantages.

Summary and Discussion

As seen in India, affirmative action in Malaysia is not a zero-sum game. The progress of the Malays seemed to have been achieved on the basis of the political sacrifice and the economic compromise of the Chinese. The balance between the two groups has been sustained because of the steady growth of the overall economy. Meanwhile, the NEP policies have created incentive problems on both sides. To some extent, they have discouraged the Malays from working hard and performing better because of the easy access to universities and jobs under the NEP program. Additionally, affirmative action has also caused many Chinese and Indian entrepreneurs and students leave their country due to the education reforms.

It is interesting to speculate about what would have happened in Malaysia without the affirmative action program. While this conjecture is difficult given the healthy growth of the country during the years that the NEP took effect, it is nonetheless possible to draw certain conclusions by looking at Malaysia's neighboring country—Singapore. In fact, the successes of Singapore cast certain doubts on the actual effect of the NEP in Malaysia.

While the same two ethnic groups constitute the majority of their populations, Singapore has been able to grow better and faster than Malaysia, without the help of affirmative action. It is possible that levels of inequalities and degrees of ethnic tensions might have been varied in these two areas prior to the onset of the breakout in 1969, but the cultural and ethnic similarities between Singapore and Malaysia are hard to deny. As complicated as the real situations have been, it is nevertheless a possibility that Malaysia might have been able to grow better in the past forty years, without the intervention of NEP. However, to determine exactly how much better and how ethnic conflicts could have been alleviated without affirmative action is something beyond the scope of this present work. These questions require further investigative research in the future.

Sri Lanka

Ethnic Background

Sri Lanka was called Ceylon before its independence in 1948. The two major ethnic groups are the Tamils and the Sinhalese. The Sinhalese account for three-quarters of total population, with the Tamils being the principal minority. Like other developing nations in Asia, Sri Lanka experienced a long history of European dominance before World War II. As a direct result of colonialism by European powers, many of the Tamils and the Sinhalese were Westernized. Most of them became Christians and the majority of both ethnic groups were educated.

However, a disparity between these two groups still emerged. Since the Tamils lived in geographically poor districts, agricultural was not a profitable endeavor for them. Consequently, many Tamils sought the economic opportunities brought by the Europeans and thus were able to more readily accept education as a way out of poverty. Although the education level of the Sinhalese was also considerable, great differences existed in the representation of the two main ethnic groups in both the universities and professions. The Sinhalese constituted the majority of attorneys, but the scientific and technical fields were dominated by the Tamils. The disparity was even sharper in the business sector where Tamils controlled most of the enterprises (Sowell, 2004).

Admittedly, the tension between the Sinhalese and the Tamils has long been existent since the colonial period. Given that the Sinhalese culture and language is only found on the island of Sri Lanka, the Sinhalese people regard their culture precious as well as vulnerable to “outsiders.” This feeling was brought about by the colonial presence of the British and later reinforced by the immigrants of Tamils, who were viewed by the Sinhalese as the people who took away most of the job and education opportunities from them. As pointed out by Robert Oberst (1988), though the Sinhalese are in the majority of the Sri Lankan population, they do not have the mentality of a majority. When the British were dominating the country, the Sinhalese could blame the British colonists and the evils of colonialism, and this is why the ethnic conflicts remained dormant during the British Rule period (Oberst, 1988).

However, once the foreign power receded, the dissatisfaction of the Sinhalese people turned to the and the abrasion between two major ethnic groups was immediately exposed.

Soon after independence in 1948, a conflict of interest broke out between the two groups when the political power fell largely into the hands of the educated, English-speaking, Westernized Tamils and Sinhalese. Meanwhile, a newly educated non-English-speaking Sinhalese class grew larger and created political pressure on the English-speaking politicians. One of the most contentious issues was adoption of English as the official language of Sri Lanka. The old elites (especially the Tamils) supported this, while the new Sinhalese rejected it fiercely. As one of the few countries with universal suffrage at that time, Sri Lanka experienced great turmoil in its efforts to resolve the language issue. Along with the demand for “Sinhala only” as the language of Sri Lanka, there arose a series of demands for preferential treatment for the Sinhalese in order to compensate for the “lost opportunities” seized by the Tamils.

In the end, Bandaranaike, a man who used the “Sinhala only” movement to reach his own political goals was elected the prime minister of Sri Lanka and launched a series of affirmative actions, beginning with establishment of Sinhala as the official language of Sri Lanka. Following this, quotas and other preferential treatments were provided for Sinhalese in areas of education and employment (Sowell, 2004). Without the favorable economic growth that aided Malaysia, the advancement of the Sinhalese was achieved at the absolute cost of the Tamils. Deprived of most educational and job opportunities, the Tamils eventually turned to violent means after peaceful protests proved fruitless.

The Tamil Tigers and the Civil Wars

Similar to affirmative action in Malaysia, in Sri Lanka it favored one ethnic group—the Sinhalese people. When Bandaranaike first came to power, the Sinhalese were under-represented in universities, especially in science departments and medical schools (Sowell, 2004). As noted earlier, the Bandaranaike government first set the language of Sinhala as the official language of Sri Lanka. In addition, quotas and lower cut-offs were extended to expand the number of Sinhalese students studying science and medicine. To create jobs for the Sinhalese, the government required compulsory retirement of Tamil civil servants who could not speak Sinhala one year after affirmative action took effect (Sowell, 2004).

The program created many problems for the Tamils. Since they were concentrated in a resource-poor area in the country, education was almost their only way out of poverty. As a result, the Tamils began protesting peacefully, but faced fierce opposition from the Sinhalese. Later Bandaranaike, a man with no real enthusiasm to keep his political promise to the Sinhalese after he was elected, sought to moderate the affirmative action. This set off a series of riots among the Sinhalese, and eventually led to the assassination of Bandaranaike in 1959. The next leader of Sri Lanka, J.R. Jayawardene, was a Sinhalese extremist and a man with greater political ambition than Bandaranaike.

Under the Jayawardene government, the Tamils continued to be marginalized and deprived of education opportunities. This exacerbated situation pushed the Tamils to turn to political upheaval and violence and demand their own autonomous state in northern Sri Lanka. They started with small armed guerilla actions. When they saw no hope of compromise by the Sinhalese government, an extremist guerilla group called the “Tamil Tigers” was formed in 1975 to seek political autonomy for the Tamils (Sowell, 2004). Thousands of Sinhalese in the northern areas were oppressed and killed by the Tamil Tigers over the next several years. In response to the Tamil violence, groups of Sinhalese gangs were organized and similar atrocities were perpetrated on the Tamils. One of the biggest tragedies occurred in 1983 when a five-day massacre of Tamils was systematically carried out across southern Sri Lanka, resulting in thousands of casualties and more than 40,000 homeless Tamils (*The Economist*, 1985).

With the economic crisis of the 1970s and the involvement of the Indian military, the violence in Sri Lanka during the 1980s nearly approached a full-scale civil war. The situation was escalated by atrocities by both groups, especially after the formation of Sinhalese terrorist groups in the 1980s. The affirmative action which first ignited the violence was no longer the center of the issue. The initial problem had been buried under widespread distrust, cruelty and hatred. *The New York Times* (Duggar, 2000) reported the following scene: “A plaintive, unsigned poster, pasted to walls all over town, asks, ‘Can’t we stop this madness?’” (p.A1)

The Economic Turmoil and Ethnic Conflicts

It is important to acknowledge that the tragedy of ethnic conflicts and the economic downturn of Sri Lanka were not caused by a single event. Like other wars and misfortunes in the world and throughout history, the crumpled economy of Sri Lanka (as well as its ethnic issues) was the result of anterior factors. The story of Sri Lanka is perhaps one of the most complicated in human history.

With affirmative action acting like a catalyst in its catastrophes, Sri Lanka has experienced two major economic crises during the past fifty years, coupled with the presence of constant political instability. These crises stemmed from erroneous economic policies, and recovery was interrupted (if not ruined) by a civil war started in 1983, which was mainly caused by underlying ethnic tensions. The calamities also resulted from polarized political interests in the country, which generated a huge obstacle in long-term policy pursuit. During the economic crises and their aftermaths, affirmative action was an important player in that it intensified the tension between the Sinhalese and the Tamils, thereby directly exacerbating the existing tumultuous economic and political issues.

Upon the independence of the country, the Sri Lankans developed their economy mostly on exports of primary commodities. As a colonial legacy, Sri Lanka was rich in plantation products such as tea, coconut and rubber (Kelegama, 2000). Therefore, they traded plantation goods for food imports that they needed desperately. When export revenue fell, the government sought the option of selectively controlling imports (thereby shielding particular industries and businesses) as a short-term solution. Because of its over-protection of the economy along with the deterioration of terms of trade after the 1950s (which hurt the plantation exports badly), the Sri Lankan economy underwent considerable stagnation. In fact, during 1961-1964, the country was hit by a serious foreign exchange crisis which immediately casted doubts on its existing policies.

To cope with the crisis, the government turned to a more open policy in 1965-1970 than before. However, the Sri Lankan authorities suddenly decided to abandon the previous policies because they considered the 1965-1970 experiment essentially unsuccessful, merely allowing valuable “foreign exchange to be squandered on non-essential imports” (Kelegama, 2000, pp.1478). With a tightening of trade regulations and an extension of nationalism, the government encouraged its people to grow food

domestically instead of relying on imports. In this way, they hoped that they could preserve the amount of foreign exchange, and could also combat the economic hardship effectively. However, before any real impact took place, the country was traumatized again by the oil crisis of the 1970s. This served as an external shock to the economy, as oil prices were increased by the Organization of Petroleum Exporting Countries (OPEC), partially because of the political situation in the Middle East. As a result, the country ended up using more of its foreign exchange, and the balance of payments became so severe that the country suffered from low growth throughout the entire 1971-1977 period (Kelegama).

When the terms of trade finally favored the country in 1975, the government resolved to embrace economic liberation. Unfortunately, the implementation of the policies was interrupted by the ethnic conflicts starting from 1983, and the country's economy was impaired severely since then. With the presence of a civil war, the regime became unfavorable to investors, and foreign assistance was pulled back. Moreover, since persistent violence in the country made it unpopular for tourists, the country's growth stagnated due to a slump in tourism revenues, which constituted a large portion of national revenues (Kelegama, 2000). The unresolved ethnic issues also proved to be a huge drag on the economy because of the growing expenditure in national defense. Evidence shows that due to the ethnic conflicts and the resulting military expenditures, the country had budget deficits averaging around 10 percent of GDP from 1985-1996 (Kelegama). In addition, the government of Sri Lanka cut its expenses on welfare programs to sustain the escalating military costs, resulting in further discontent among the population.

Another factor contributing to the unsuccessful growth was the country's polarized political party structure. While the major two parties (both Sinhalese-dominated) were polarized between a conservative right and a communist-oriented left, any economic policy set up by the opposing party five years earlier would be reversed (or repealed) once a new party took power. This made it extremely hard to fully implement a single-minded policy, and is perhaps the reason why the Sri Lankan government went back and forth between liberalism and protectionism during 1960-1983. Even if any of the implemented policies has been effective, their outcome would only have been mild due to the lack of consistence and

cohesion in policy implementation. In this aspect, political problems (along with ethnic issues) also exacerbated the economic turmoil.

Summary and Discussion

While affirmative action has perhaps improved the lives of the Sinhalese in terms of education and job opportunities, the program has devastated the entire country by setting off ethnic conflicts and ever-escalating warfare. It is noteworthy, however, that universal suffrage and a democratic system have worsened the situation by spurring mistrust and anger between ethnic groups. When we look back at the history of Sri Lanka, it is striking that a country that was perceived “the best bet of Asia” at the time of its independence has been completely torn down by improper policies and political pluralism (Kelegama, 2000). In fact, at the beginning of its independence, Sri Lanka was one of the few countries in the world that had universal healthcare and minimal military spending (Moore, 1990). However, the ethnic conflicts that were triggered by affirmative action severely staggered the country’s growth. The welfare state was traumatized and defense spending skyrocketed, which became a huge burden on an already vulnerable economy.

One of the key questions we reiterate is this: What would have happened without the prevalence of affirmative action? In the case of Sri Lanka, the answer is complex due to the intertwining of a number of other issues—namely its economic difficulties and political decay. Nevertheless, it is reasonable to surmise that if affirmative action in the present form had not been implemented (or if a less forceful policy had been attempted), ethnic conflicts as severe as those existing today might have been avoided, and that the recovery plan interrupted by the civil war could have been implemented more thoroughly. Moreover, if the Sinhalese had responded to the peaceful demonstration in the first place, the Tamils would not have resorted to violent means and started a war lasting for decades. Consequently, without the presence of ethnic conflicts, Sri Lanka would have grown better in the past fifteen years. It is likely that defense expenditures would have been lower, leaving the country more capital for dealing with economic issues. To sum up, with a less extensive policy implemented, conditions might never have been exacerbated so greatly, and the country might have had a better chance for economic resurgence.

Conclusion

Combining the theoretical and statistical examination of the first two chapters, my conclusion is that the relationship between ethnic diversity and economic performance is much more complicated than I thought. The economic evidence from Chapter 2 failed to support a direct relationship between ethnic diversity and a country's long-term growth. In spite of all the theories presented in Chapter 1, the data analysis refused to substantiate any straightforward causation between ELF and economic growth.

However, the last few regressions in Chapter 2 (Table VI) seem to provide some hope. Since ELF is significantly related to indicators of Bureaucratic Quality, Rule of Law, Corruption, Revolutions and Coups and Economic Openness, it is evident that ethnolinguistic fractionalization somehow affects the economy indirectly. Though the exact ways in which this occurs is yet unclear, ethnic heterogeneity seems to be an important factor in the outcome of certain public policies. Some concerns and questions (such as the assumption of certain exogenous variables) are discussed in the last section of Chapter 2; since these problems are currently beyond the scope of this research, they need further examination in the future.

To examine policies that directly address ethnic issues, Chapter 3 reviews the influence of affirmative action in India, Malaysia and Sri Lanka, with a minor discussion of Singapore's policy. The goal of this effort was to examine the programs' actual outcomes and their effectiveness. The ethnic background and policy details were presented for each country, and the limits of the policies were discussed. Much research work has consolidated the necessity of affirmative action through principles of compensation and correction. While certain positive effects and results have also been presented, there seems to exist some common weaknesses of the policies.

Examining the evidence from these countries, it could be inferred that for the most part, affirmative action seems to sacrifice some degrees of efficiency in order to achieve its quantitative goals. To compensate for past wrongs, affirmative action may result in a zero-sum game at the beginning of the program, but this does not hold up during the long run. On one hand, groups with preferential treatment can demand more and more, causing a drag on the economy. On the other hand, excessive subsidies and

aid are likely to cause incentive problems for both the beneficiaries and non-preferred groups. As seen in both India and Malaysia, with extensive support, the preferred groups may feel less pressure to exert effort and produce output. In addition, biased policies are likely to spur bitterness and resentment in non-preferred groups, either creating less incentive to perform or causing ethnic conflicts. In this sense, the net impact of affirmative action is likely to be negative.

Nevertheless, the actual play-out of affirmative action in these countries should be treated carefully. The outcomes of affirmative action vary substantially, depending on the country's history and its economic and political environment. On one hand, affirmative action unifies India and it seems to be a must in such a highly stratified society. On the other hand, affirmative action in Sri Lanka acted like a catalyst in exacerbating economic turmoil and political deterioration. In the case of Malaysia, the effects of affirmative action are somehow veiled by the steady growth of the economy. However, given the situation in nearby Singapore, it is arguable that Malaysia might have done better without affirmative action. From these perspectives, it is difficult to determine whether affirmative action actually worsens or improves a country's economy. Therefore, we can only conclude that the actual effects of the policies depend on the individual country, and the outcomes of the program tend to vary across countries.

As complicated as the problem seems, at least one conclusion can be made. An improper ethnic policy—one that does not fit the country well or fails to address key issues—is likely to induce serious consequences. Disastrous events, mostly ethnic conflicts and civil wars, are likely to take place in those countries if ethnic policies are not designed well. Therefore, since ethnically diverse countries often have policies that address issues of inequality between different ethnic groups, it is important for policy makers in those countries to imbue great carefulness in planning those policies. To minimize inefficiencies and the outbursts of conflict, it would be wise to investigate thoroughly the ethnic background in the target country and to study the programs already existent in other countries.

Finally, several suggestions can be made regarding the inefficiencies of affirmative action plans. Given the justification and political implications of these policies, I agree that affirmative action is often necessary to help out devastated populations, though the details of the policies must be examined

carefully and critically. It is crucial to allow certain levels of flexibility within the policy so that if things go badly, policy clauses could be revised and adjusted. In addition, while it is vital to enact a policy that fits the individual country, the initial scale of the policy should be moderate so that the government does not take on too many risks. As a specific note, based on the cases in India, individual eligibility also should be included to alleviate the problem of the “creamy layer.”

Apart from the suggestions above, an exit strategy (however unfriendly it may sound) should be considered to resolve the incentive problem. If the affirmative action plan starts to cause massive scales of disincentives, it might be time to start planning to quit. I realize that (perhaps because of impracticability in the political campaigns) exit strategies are not likely to be welcomed. Nevertheless, if a policy had certain flexibility for revision in the first place, a reduction of its benefits could be achieved with reasonable appeal to certain groups in the population. While a repeal of affirmative action is almost impossible, a wise leader might consider the economic implications of the policies and call for improvements for the greater good.

Appendix I

Data Description and Sources

Variable	Code	Description and Source
GDP per capita growth from 1965 to 1990	gdp6590	Instantaneous growth rate of PPP-adjusted GDP per capita from 1965 to 1990 from the Penn World Tables 5.6 (Summers and Heston, 1994)
GDP per capita in 1965	gdp65	GDP per capita in 1965 (in constant 2000 US dollars) from World Bank (2010).
Current account in 1985 (% of total GDP)	ca1985	Current account in 1985 from World Bank (2010).
The net growth of labor force	$n - \pi$	It is calculated as the growth of population aged 15-64 minus the growth of total population from 1965 to 1990. All data are from World Bank (2010).
landlocked	landlocked	Indicator for landlocked countries. Landlocked countries are valued one, while the others are zero.
landlocked, but not European	landleu	Indicator for landlocked countries, excluding countries in Western and Central Europe (Austria, the Czech Republic, Hungary, the Former Yugoslav Republic of Macedonia, Slovakia, and Switzerland). Includes Eastern European countries of Belarus and Moldova.
Share of years that open, 1965-1990	open6590	It's the share of years that a country is open to trade during 1965-1990. A country is considered open if it meets minimum criteria on four aspects of trade policy: average tariffs must be lower than 40 percent, quotas and licensing must cover less than 40 percent of total imports, the black market

		premium must be less than 20 percent, and export taxes should be moderate (Gallup, Sachs and Mellinger, 1999)
Life Expectancy in 1965	lifex65	Life expectancy in 1965. Data comes from World Bank (2010).
Share of tropical land (% of total land)	ztropics	It's the proportion of the land of a country that is tropical (Gallup, Sachs and Mellinger, 1999)
Bureaucratic quality	bq	Bureaucratic quality index. This is an index from the Center for Institutional Reform and the Informal Sector (IRIS) from data printed in the International Country Risk Guide. A high score means "autonomy from political pressure", and "strength and expertise to govern without drastic changes in policy or interruptions in government services (Sachs and Warner, 1997, pp. 29-33)." Scores range from 0-6.
Corruption	corr	Corruption in government index. See the sources for bq. A low score means illegal payments and bribes are pervasive in government (Sachs and Warner, 1997). Scores range from 0-6.
Rule of law	rl	Rule of Law index. See the sources for bq. The variable was measured for 1982. This index reflects how much the citizens of a country are willing to accept the established institution to "make and implement laws and adjudicate disputes (Sachs and Warner, 1997, pp.30)." Scores range from 0-6.
Assassinations	Assassp	Number of assassinations per million populations per year, 1970-1985. Source: Barro and Lee, 1994.
Revolutions and coups	recoup	Number of revolutions and coups

		per year, averaged over the period 1970-1985. Source: Barro and Lee, 1994.
Share of natural resource in export, 1970	exp	Share of exports of primary products in GNP in 1970. Primary products include fuel and non-fuel primary products. Source: Sachs and Warner, 1997.
Ethnolinguistic Fractionalization, 1961	ELF61	Measures of ethnolinguistic fractionalization in 1961. Source: Roeder, 2001.
South and Southeast Asia	SASIA	This is the indicator for South and Southeast countries. A country belongs to the following has value one: Afghanistan, Bangladesh, India, Indonesia, Lao PDR, Malaysia, Myanmar (Burma), Nepal, Pakistan, the Philippines, Singapore, Sri Lanka, Thailand and Vietnam. All the other countries have value zero.
Latin America	LAMERICA	This is the indicator for Latin American countries. A country has value one if it is one of the following: Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, the Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Trinidad and Tobago, Uruguay and Venezuela. All the other countries are valued zero.

Appendix II

Formula Specification

Using the human capital augmented Solow Model, we get the following equation:

$$Y = \theta (K)^\alpha (H)^\delta (L)^{1-\alpha-\delta} \quad (1)$$

Where Y is the total production, K is physical capital, H is human capital, L is total number of workers, and θ is total factor productivity. We then divide each side of (1) by L , and we will have:

$$(Y/L) = \theta (K/L)^\alpha (H/L)^\delta$$

Replace (Y/L) with q which is output per worker. We also replace (K/L) with k which is physical capital per worker, and (H/L) with h which is human capital per worker. Then linearize the equation by taking natural logarithm on each side, we will get:

$$q = \theta + \alpha k + \delta h \quad (2)$$

Using the assumption of steady-state condition, the increase of physical and human capital in a steady-state status would be zero. Given the linearized results, the equation for the physical capital in the steady-state condition would be $se^q = (d+n) e^k$, where s is savings rate, d is the depreciation on physical capital, and n is the labor force growth. After plug it back to equation (1) (let $\delta = 0$ for convenience), we will see that the physical capital in the steady state (k^*) is a function of any variable that affects the savings rate (s) or factor productivity (θ).

Let k^* and h^* be the physical and human capital in the steady state, then the rate of change of k and h from the initial condition to the steady state could be rewritten as (k^*-k) and (h^*-h) . Take derivatives on each side of the equation (2):

$$(dq/ dt) = \alpha (dk/dt) + \delta (dh/dt) \quad (3)$$

which can be reformulated under the steady-state condition in the following way:

$$q^*-q = \alpha (k^*-k) + \delta (h^*-h)$$

in which q^* is the out per worker in the steady state. This equation also means

$$(k^*-k) = (1/\alpha) (q^*-q) - (\alpha/\delta) (h^*-h) \quad (4)$$

Replace (dk/dt) in formula (3) with (4), and we will get the growth dynamics as the following:

$$(dq/ dt) = \beta(q^*-q) - \rho(h^*-h) + \delta (dh/dt)$$

we continue with this equation and we will get:

$$(dq/ dt) = -\beta q + \beta q^* - \rho h^* + \rho h + \delta (dh/dt)$$

We let βq^* equals to ΦZ and Z is the determinants of long-run growth. In the Sachs and Warner paper (1997), Z is all the exogenous factors that affect a country's long-run growth. Ideally, such variables

include measures of geography, measures of resource endowments and measures of economic policy (Sachs and Warner).

We also put h^* in constant term C , then the growth dynamics will be:

$$(dq/dt) = -\beta q + \Phi Z + \rho h + \delta (dh/dt) + C \quad (5)$$

According to Sachs and Warner, (dh/dt) is positively related to h but negatively related to h^2 (1997). Hence we can further expand equation (5) by reformulating the ρh and the (dh/dt) terms:

$$(dq/dt) = -\beta q + \Phi Z + \nu h + \gamma h^2 + C \quad (6)$$

Theoretically, due to demographic transition there may be a gap between the population and the growth of the labor force. We denote (dy/dt) as the rate of growth of GDP per capita. Let π be the rate of total population growth and n the rate of labor-force growth. Then, according to Sachs and Warner (1997), $(dy/dt) = (dq/dt) + (n + \lambda - \pi)$. Replace (dq/dt) with equation (6), and we will get:

$$(dy/dt) = \beta_0 + \beta_1 q + \beta_2 Z + \beta_3 h + \beta_4 h^2 + (n - \pi) + \varepsilon$$

Where β_0 includes terms of h^* , λ and C , and ε is the estimate for error. Using i to denote individual country, we then arrive at equation (*):

$$(dy/dt)_i = \beta_0 + \beta_1 q + \beta_2 Z_i + \beta_3 h_i + \beta_4 h_i^2 + (n - \pi)_i + \varepsilon_i \quad (*)$$

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- Conducted research for a professor on healthcare issues involving the impact of ever-increasing medical costs and expenditures
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