NAVAL POSTGRADUATE SCHOOL

MONTEREY, CALIFORNIA

THESIS

DETERMINANTS OF CONFLICT IN THE PHILIPPINES

by

Jesus P. Durante III

June 2012

Thesis Co-Advisors	Nancy Roberts
	Sean Everton
Second Reader:	Kristen Tsolis
Third Reader:	William Fox

Approved for public release: distribution is unlimited

THIS PAGE INTENTIONALLY LEFT BLANK

REPORT DOCUMENTATION PAGE			*Form Approved OMB No. 0704-0188*
Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instruction, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188) Washington DC 20503.			
1. AGENCY USE ONLY ***(Leave blank)***	**2. REPORT DATE** June 2012	**3. REPORT TYPE AND DATES COVERED** Master's Thesis	
4. TITLE AND SUBTITLE Determinants of Conflict in the Philippines			**5. FUNDING NUMBERS**
6. AUTHOR(S) Jesus P. Durante III			
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Naval Postgraduate School Monterey, CA 93943-5000			**8. PERFORMING ORGANIZATION REPORT NUMBER**
9. SPONSORING /MONITORING AGENCY NAME(S) AND ADDRESS(ES) N/A			**10. SPONSORING/MONITORING AGENCY REPORT NUMBER**
11. SUPPLEMENTARY NOTES The views expressed in this thesis are those of the author and do not reflect the official policy or position of the Department of Defense or the U.S. Government. IRB Protocol number _____N/A_____.			
12a. DISTRIBUTION / AVAILABILITY STATEMENT Approved for public release: distribution is unlimited			**12b. DISTRIBUTION CODE** A

13. ABSTRACT (maximum 200 words)

Conflict has many causes. Assertions have been made about the relationship of conflict with several factors based on theories, beliefs and principles. Identifying and explaining the determinants of armed conflict in the Philippines is expected to lead to better comprehension and insights on its resolution. Four independent variables are examined as predictors of conflict: ethnicity, poverty, governance, and literacy. The research primarily utilizes empirical data and projects it in map overlays with the use of the ArcGIS. Bivariate and multivariate statistical models are estimated to derive the relationship between the variables and conflict and to validate the hypothetical claims.

14. SUBJECT TERMS Determinants, Conflict, Philippines, Poverty, Ethnicity, Ethnic Diversity, Literacy, Good Governance, Mindanao, Bayanihan, IPSP, NISP, Abu Sayyaf Group, ASG, MILF, MNLF, CPP, NPA, Geospatial Analysis, OpenGeoda, Descriptive Statistics, z-test, Central Limit Theorem, one-tailed test, relative deprivation, political control, insurgency, terrorism, linear regression, density hotspots, Stata, negative binomial regression, bootstrap, countfit.	**15. NUMBER OF PAGES** 140
	16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	**18. SECURITY CLASSIFICATION OF THIS PAGE**	**19. SECURITY CLASSIFICATION OF ABSTRACT**	**20. LIMITATION OF ABSTRACT**
Unclassified	Unclassified	Unclassified	UU

NSN 7540-01-280-5500 Standard Form 298 (Rev. 2-89)
Prescribed by ANSI Std. 239-18

THIS PAGE INTENTIONALLY LEFT BLANK

Approved for public release, distribution is unlimited

DETERMINANTS OF CONFLICT IN THE PHILIPPINES

Jesus P. Durante III
Lieutenant Colonel, Philippine Army
B.S., Philippine Military Academy, 1992

Submitted in partial fulfillment of the
requirements for the degree of

MASTER OF SCIENCE IN DEFENSE ANALYSIS

from the

NAVAL POSTGRADUATE SCHOOL
June 2012

Author: Jesus P. Durante III

Approved by: Nancy Roberts
Thesis Co-Advisor

Sean Everton
Thesis Co-Advisor

Kristen Tsolis
Second Reader

William Fox
Third Reader

John Arquilla
Chair, Department of Defense Analysis

THIS PAGE INTENTIONALLY LEFT BLANK

ABSTRACT

Conflict has many causes. Assertions have been made about the relationship of conflict with several factors based on theories, beliefs and principles. Identifying and explaining the determinants of armed conflict in the Philippines is expected to lead to better comprehension and insights on its resolution. Four independent variables are examined as predictors of conflict: ethnicity, poverty, governance, and literacy. The research primarily utilizes empirical data and projects it in map overlays with the use of the ArcGIS. Bivariate and multivariate statistical models are estimated to derive the relationship between the variables and conflict and to validate the hypothetical claims.

THIS PAGE INTENTIONALLY LEFT BLANK

TABLE OF CONTENTS

LIST OF FIGURES

THIS PAGE INTENTIONALLY LEFT BLANK

LIST OF TABLES

THIS PAGE INTENTIONALLY LEFT BLANK

LIST OF ACRONYMS AND ABBREVIATIONS

AFP	Armed Forces of the Philippines
AGI	Administrative Governance Index
AHAI	Al-Harakatul al Islamiya
ARMM	Autonomous Region in Muslim Mindanao
ASG	Abu Sayyaf Group
CPP	Communist Party of the Philippines
ELF	Ethno-Linguistic Fractionalization
EGI	Economic Governance Index
GDP	Gross Domestic Product
GGI	Good Governance Index
GIS	Geographic Information System
GRP	Government of the Republic of the Philippines
LGU	Local Government Unit
MILF	Moro Islamic Liberation Front
MNLF	Moro National Liberation Front
NDF	National Democratic Front
NISP	National Internal Security Plan
NPA	New People's Army
NPS	Naval Postgraduate School
NSCB	National Statistics Coordination Board
NSO	National Statistics Office
NUC	National Unification Council

PGI	Political Governance Index
Sigacts	Significant Activities
UNESCO	United Nations Educational, Scientific and Cultural Organization

ACKNOWLEDGMENTS

Commit your work to the Lord, and then your plans will succeed.

– Proverbs 16:3

Life as a student in the Naval Postgraduate School has been challenging and memorable. Challenging due to the academic requirements and standards set by the institution, and memorable because this is the first time that I went to school with my family by my side.

I would like to thank the faculty who have been so exceptional in imparting their expertise and knowledge to the students. Special mention goes to my thesis advisers, Nancy Roberts, Sean Everton, William Fox, and Kristen Tsolis; to the CORE Lab staff and personnel Rob, Greg, and Joyce, who provided utmost technical support; to the International Programs Office, who made the stay of the international students more meaningful and enjoyable; to my American and allied classmates, who have been supportive and reassuring in all of our endeavors; to my family, my ever thoughtful and loving wife, Helen, and children, Lorenz, Mikaela, and Micolo; and to the Filipino people… this I dedicate to you.

THIS PAGE INTENTIONALLY LEFT BLANK

I. INTRODUCTION

> *Societal variables that affect the focusing of discontent on political objects include the extent of cultural and subcultural sanctions for overt aggression, the extent and degree of success of past political violence, the articulation and dissemination of symbolic appeals justifying violence, the legitimacy of the political system and the kind of responses it makes and has made to relative deprivation.*
>
> – Ted Gurr[1]

A. BACKGROUND

The security situation in some parts of the Philippines has been threatened by violence and armed confrontations that have been draining the country of its resources and hampering its development. Presently, the state is seeking to resolve internal security problems especially with three groups: the communists, secessionists, and terrorists.

The Communist Party of the Philippines (CPP) and its military arm, the New People's Army (NPA), has launched an armed struggle against the government since 1968. The organization was strongest in the 80s and has since become a social movement, with an array of above-ground groups intertwined with an underground guerrilla arm.[2] Founded by Jose Maria Sison in the late 60s, the communists' ultimate aim is to overthrow the government through armed struggle and establish a politburo under the CPP. The Communists has been utilizing socio-economic and political issues to justify their cause and to entice the populace to sympathize and support the revolutionary movement. The CPP/NPA has organized and deployed their forces throughout the country. Guerrilla fronts have been established in the countryside and remain as a potent threat to the government security forces.

Aside from the communist insurgents, the Muslim secessionist movement is likewise waging a revolutionary struggle with the vision of establishing an independent

---

[1] Tedd Gurr, *Why Men Rebel,* (Princeton: Princeton University Press, 1965), 13.

[2] "The Communist Insurgency in the Philippines: Tactics and Talks," Asia Report N°202, Crisis Group 14 (February 2011), i.

Bangsamoro state. In the early 70s, Muslim grievances and sentiments against discrimination, marginalization and abuse led to the creation of the Moro National Liberation Front (MNLF). Peace negotiations between the Philippine government and the MNLF led to the creation of the Autonomous Region for Muslim Mindanao (ARMM) and the integration of some of the MNLF fighters in the ranks of the police and the military. Despite the peaceful resolution, a more radical Islamist group emerged, the Moro Islamic Liberation Front (MILF). The MILF started as a reformist group in the MNLF, and it totally parted ways with the MNLF when the latter started negotiating with the government. Since the 90s the MILF has figured in violent armed confrontation with the government.

The third security threat that the Philippine state is facing is the Abu Sayyaf terrorist group. The Abu Sayyaf ("bearer of the sword") is an Islamist separatist group founded by Ustadz Abdurajak Abubakar Janjalani in the early 1990s. Also known as Al-Harakatul al Islamiya (AHAI), the ASG aims to pursue "jihad qital", an armed struggle, to create a pure Islamic state in southern Philippines based on Salafi Wahhabism.[3] The MNLF and the MILF were already in existence when the ASG was founded. Basilan and Sulu province, where the ASG operates, is mainly influenced by the MNLF. However, several MNLF leaders, who felt sidelined or disagreed with Nur Misuari consequently joined Janjalani. The group has been suspected of having a direct link to Al Qaeda. The ASG has perpetrated several terrorist acts that include bombing, kidnapping, assassination and murder. Most of their attacks were directed at Christian churches, missionaries and non-Muslim communities. The ASG has been tagged as a terrorist entity by the Philippines and the United States.

Insurgency and conflict in the Philippines have withstood the test of time, despite the government's effort in resolving them. Presently, the CPP/NPA still operates in almost all of the provinces except for some areas within the ARMM. Meanwhile, the MILF and the ASG operates mainly in the islands of Mindanao and is most active in the ARMM region (Figure 1 illustrates the country by region). The Philippine government

[3]Zachary Abuza, "Balik-Terrorism: The Return of the Abu Sayyaf" (Strategic Studies Institute, U.S. Army War College, 2005), 2.

has tried to resolve conflict in different ways. Counterinsurgency and counterterrorist campaigns have been waged against communist insurgents, secessionists and terrorists. For the communist and secessionists, the government has been trying to resolve conflict through peace negotiations. For the terrorists, full police and military operations are being conducted to eliminate the ASG. However, despite several decades of government action, all of the threats still exist.

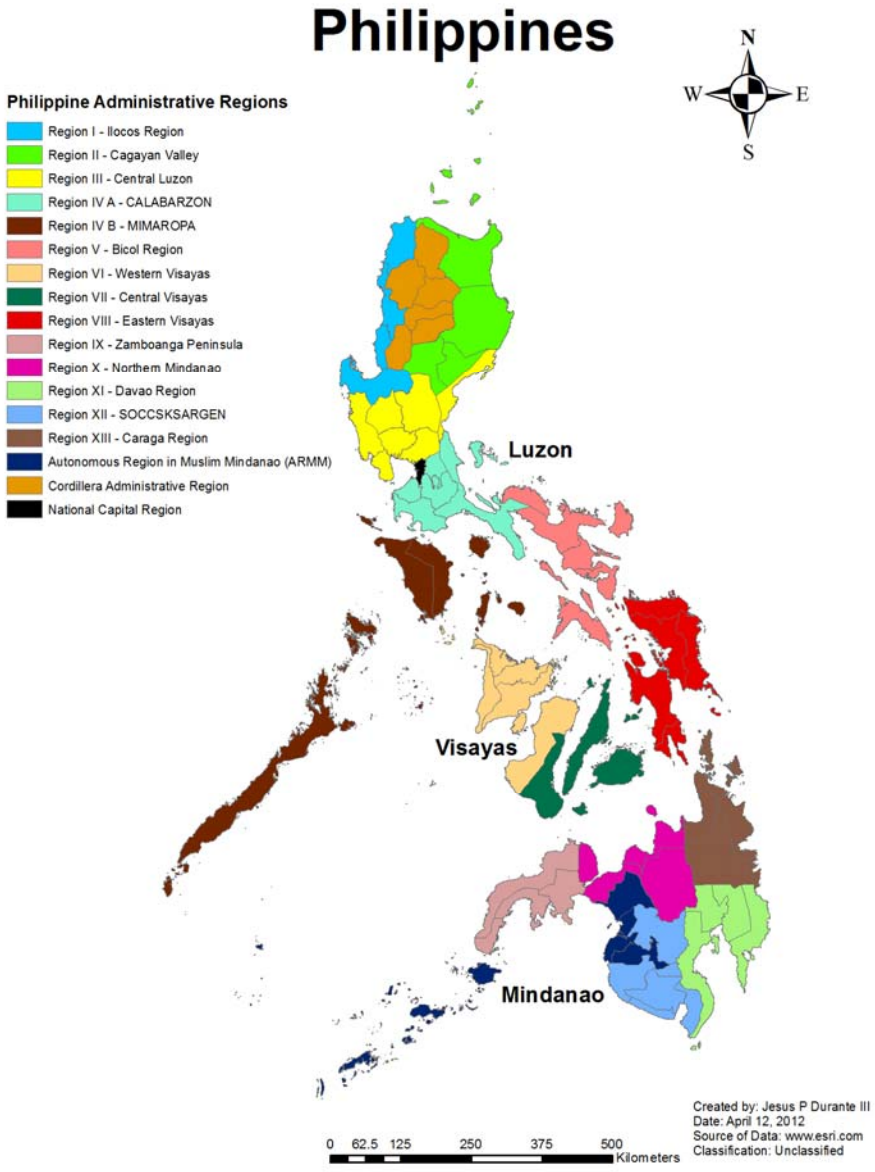


Figure 1. Map of the Philippines by Region.

B. PURPOSE

This thesis is guided by the research question: What are the determinants of armed conflict, (e.g. insurgency and terrorism) in the Philippines? It is assumed that a better understanding of the determinants that produce conflict could lead to insights on how to resolve it.

For this thesis, insurgency is defined as "an organized movement aimed at the overthrow of a constituted government through the use of subversion and armed conflict."[4] Insurgency primarily aims to weaken government control and legitimacy through a protracted armed struggle. In the Philippines the primary insurgent groups are the CPP/NPA and the MILF. Meanwhile, terrorism is defined as "the unlawful use of use of force and violence against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political or social objectives."[5] The primary terrorist group in the Philippines is the ASG. It is to note that the insurgents in the furtherance of their goals likewise utilize terrorism.

C. STRUCTURE OF THE THESIS

This thesis is structured into six chapters. Chapter I introduces the purpose and organization of the thesis. Chapter II is an in-depth literature review on the determinants of conflict. Based on the literature review, four variables emerge that I believe to be central issues in violent disputes and armed clashes in the Philippines: ethnic diversity, poverty, governance, and literacy.

The research design is thoroughly explained in Chapter III. The thesis relies on a case study of the Philippines to examine the determinants of conflict. The research methods entail projecting empirical data on map overlays with the use of the ArcGIS software. Descriptive statistics and negative binomial regression analysis examine the relationships among the four independent variables and conflict. In Chapter IV, the data

---

4 "FMI 3-07.22 Counterinsurgency Operations" (US Army, October 2004), 1.

5 "Terrorism 2002-2005," *Federal Bureau of Investigation*, n.d., http://www.fbi.gov/stats-services/publications/terrorism-2002-2005/terror02_05. Federal Bureau of Investigation, accessed May 1, 2012, http://www.fbi.gov/stats-services/publications/terrorism-2002-2005/terror02_05

are analyzed using quantitative methods with data drawn from the Philippine National Statistics Coordination Board (NSCB), the Armed Forces of the Philippines (AFP) and the Naval Postgraduate School Common Operational Research Environment (CORE) Lab. Chapter V discusses the support for the hypotheses in the multi-year study in light of government efforts and campaigns to reduce conflict. The last chapter concludes the study and summarizes findings. It also offers recommendations for follow-on research and analysis.

THIS PAGE INTENTIONALLY LEFT BLANK

II. LITERATURE REVIEW AND HYPOTHESES

> *Dispositions to violence, and to peace, are deeply rooted in human culture and vary markedly among cultures. People acquire basic attitudes about the desirability of acting out their aggression as children, and then and later in life develop attitudes about the responsibilities of rulers for their well-being*.
>
> – Ted Gurr (p. 192)[6]

Armed conflicts are defined as open, armed clashes between two or more centrally organized parties, with continuity between the clashes, in disputes about power over government and territory.[7] The cause of armed conflict varies from one place to another. Several explanations have been made on the cause of disputes. For example, poor economic conditions are the most important long-term causes of intrastate armed conflict.[8] This is due to the frustration and the sense of deprivation that permeates in the populace. Hard line political systems are also prone to armed struggle.[9] Repression of civil rights and physical abuse tend to make the populace hostile to the government. Parties to a conflict are often defined by their different ethnic identities and they too may prompt violence.[10]

A. DETERMINANTS OF CONFLICT

In the National Unification Commission (NUC) Report to President Fidel V. Ramos in 1993, the result of nationwide consultation identified the root causes of Philippine internal armed conflicts as follows:[11]

---

6 Tedd Gurr, *Why Men Rebel,* (Princeton: Princeton University Press, 1965), 192.

7 Dan Smith, Trends and Causes of Armed Conflict, *Berghof Research Center for Constructive Conflict Management* (2004), 2.

8 Dan Smith, Trends and Causes of Armed Conflict, *Berghof Research Center for Constructive Conflict Management* (2004), 7.

9 Dan Smith, Trends and Causes of Armed Conflict, *Berghof Research Center for Constructive Conflict Management* (2004), 7.

10 Dan Smith, Trends and Causes of Armed Conflict, *Berghof Research Center for Constructive Conflict Management* (2004), 7.

11 National Unification Commission (Philippines), *National Unification Commission Report to President Fidel V. Ramos on the Pursuit of a Comprehensive Peace Process*.

- Massive and abject poverty and economic inequity, particularly in the distribution of wealth and control over the resource base for livelihood
- Poor governance, including lack of basic social services, absenteeism of elected local officials, corruption and inefficiency in government bureaucracy, and poor implementation of laws, including those that should protect the environment
- Injustice, abuse of those in authority and power, violations of human rights, and inequity, corruption and delays in the administration of justice
- Structural inequities in the political system, including control by an elite minority, traditional politicians and political dynasties, and enforcement of such control through private armies
- Exploitation and marginalization of indigenous cultural communities, including lack of respect and recognition of ancestral domain and indigenous legal and political systems

Other causes include ideological differences between conflicting parties; perceived foreign and intervention in domestic affairs; and degeneration of moral values. It likewise includes among others the destruction of the natural environment; the conduct of the counter-insurgency campaign; and the continuing hardships of communities trapped in the armed conflict.[12]

In the literature of the CPP-led national democratic revolution, it cited the land problem of the peasantry as the main democratic content of the Philippine revolution to seize political power.[13] The insurgents utilized the issue on feudalism to gain the support of the peasants. In a study applying multivariate statistical techniques to draw up a vulnerability index of the country's 75 provinces to CPP-NPA insurgency, it indicates that the main components that in effect cause insurgency include endemic poverty, educational deprivation, ill health, social injustice, and socio-economic deprivation.[14]

[12] National Unification Commission, NUC Report to PRES. FIDEL V. RAMOS on the Pursuit of a Comprehensive Peace Process (Quezon City, 1 July 1993), 27.

[13] Soliman. Santos Jr, *Evolution of the Armed Conflict on the Communist Front*. Human Development Network Foundation, Inc. for the Philippine Human Development Report, 2005, 3.

[14] Soliman. Santos Jr, *Evolution of the Armed Conflict on the Communist Front*.

1. Social Instability – Heterogeneous Society

It has been argued by some analysts that conflicts of the future will occur along cultural fault lines separating civilizations from one another.[15] Civilizations have their own distinct history, language, culture, tradition and religion. Difference in views and beliefs may lead to misunderstanding and disagreement between groups. Moreover, the entitlements granted to a certain group may be viewed as unfair and biased. Such frustrations can lead to aggression and violence. Countries such as the former Yugoslavia and Rwanda have experienced violent armed clashes between warring ethnic groups. The violence turned to genocidal massacre. Thus, the more heterogeneous the society the more likely social fault lines could fracture.[16]

In a heterogeneous society such as the Philippines, it has been asserted that struggle among classes is highly probable due to societal differences. This assumption is common among journalists, policy makers, and academics, which hold "plural" societies to be especially conflict-prone due to ethnic or religious tensions and antagonisms."[17] The Philippines has a complex heritage mix of Malay, Spanish, American and Asian cultures. Tagalog and English are the official languages. About 120–170 distinct indigenous dialects are being recognized as official regional languages. Christianity is the main religion. Other religion includes Islam, Buddhism, and Hinduism.[18] In contrast to a homogenous society, more struggle is expected among the social classes due to a lack of common language, norms and beliefs.

To the contrary, normative theorists and empirical researchers assert that heterogeneity may contribute to effective democracy by broadening the range of

---

15 Samuel P Huntington, "The Clash of Civilizations," *Foreign Affairs 72 (3, Summer),* 25.

16 Sharon Siddique, "Social Cohesion and Conflict in Southeast Asia," in *Social Cohesion and Conflict Prevention in Asia: Managing Diversity Through Development*, ed. Nat J. Colletta, Teck Ghee Lim, Anita Kelles-Viitanen (Washington DC: World Bank, 2001), 29, Accessed December 20,2011, http://books.google.com/books?id=64Fvi7j42wMC&pg=PA29&dq=heterogeneous+society+and+conflict

17 James D Fearon and David D Laitin, "Ethnicity, Insurgency and Civil War," *American Political Science Review Vol 97, No. 1* (February 2003): 75.

18 "Demographics of the Philippines," Wikipedia, accessed September 10, 2011, http://en.wikipedia.org/wiki/Demographics_of_the_Philippines.

collective problem solving.[19] They argue that a heterogeneous society may enhance understanding of the other's perspective thus increasing the level of perceived freedom. This view is consistent with Fearon and Laitin's claim that "it appears *not* to be true that a greater degree of ethnic or religious diversity—or indeed any particular cultural demography—by itself makes a country more prone to civil war. To test these assumptions, I derived the following hypothesis between ethnic diversity and conflict in the Philippines:

Hypothesis 1: Areas with a high level of ethnic diversity are likely to show high levels of armed conflict.

A heterogeneous environment has been asserted to have an effect on the political and social stability of the state. The more diverse the society, such as ethnicity and language, the more it is prone to conflict. As ethnic diversity increase conflict also increase. Ethnic diversity is measured through the index of ethno-linguistic fractionalization (ELF) which will be discussed further in the next chapter.

2. Poverty

Philippine Republic Act (RA) 8425, known as the Social Reform and Poverty Alleviation Act, defines poor as individuals and families whose income fall below the poverty threshold as defined by the government and/or cannot afford in a sustained manner to provide their basic needs of food, health, education, housing and other amenities of life. Poverty has been a recurrent problem in the Philippines. The proportion of household living below the poverty line has declined very slowly and unevenly in the past four decades (from 1970 to 2010), and poverty reduction has been much slower than its Southeast Asian neighbors, such as Vietnam, Indonesia, and Thailand.[20] Other reasons for the relatively moderate poverty decline include the high rate of inequality across

[19] Christopher J Anderson and Aida Paskeviciute, "How Ethnic and Linguistic Heterogeneity Influence the Prospects for Civil Society: A Comparative Study of Citizenship Behavior" *The Journal of Politics*, Vol. 68, No. 4, (November 2006): 799.

[20] Fernando Aldaba, *Poverty in the Philippines: Causes, Constraints, and Opportunities* (Philippines: Asian Development Bank, 2009), 1.

income brackets, regions, and sectors; and unmanaged population growth.[21] A study by Fernando Aldaba on poverty on the Philippines cites that the main characteristics of the poor include the following:

- The majority live in rural areas and work in the agriculture sector, mostly as farmers and fishers.
- In the urban areas, such as Metro Manila, they are found in slums and the informal sector.
- They have large families (six members or more).
- In two-thirds of poor families, the head of household has only an elementary education or below.
- They have no or few assets and minimal access to credit.[22]

There are various contributors to poverty: economic growth, inequality, political instability, natural disasters, energy crisis, among others. The Philippine economy has been growing in recent years. However, economic growth has not translated into poverty reduction. While the country has experienced moderate economic growth, poverty reduction has been slow. Inequality has remained high, which mitigates the positive impact of growth on poverty reduction.[23]

Poverty contributes to violent conflict in a number of ways. For example, poverty makes recruitment for fighters easier. The lack of viable livelihood may drive people to be recruited by armed groups, whether insurgents, gangs or warlords.[24] Violence may become an alternative source of living in the absence of opportunities. In such situations where there are few sources of livelihood, joining military groups may represent an essential survival strategy.[25] Persistent levels of poverty may make soldiering or violence an attractive means of earning a living when other means of earning livelihoods offer

---

[21] Fernando Aldaba, *Poverty in the Philippines: Causes, Constraints, and Opportunities*, 1.

[22] Fernando Aldaba, Poverty in the Philippines: Causes, Constraints, and Opportunities, 2.

[23] Fernando Aldaba, Poverty in the Philippines: Causes, Constraints, and Opportunities, 3.

[24] Addison, et al., " Chronic poverty and violent conflict: 'Fragile States' and the Social Compact,"2.

[25] Jonathan Goodhand, "Violent Conflict, Poverty and Chronic Poverty," CPRC Working Paper 6 (May 2001), 25.

limited opportunities. [26]According to the 2005 Philippine Human Development Report, armed conflicts are expected to occur and to persist in areas that are the most deprived where deprivation is broadly measured by such variables as poverty incidence, inequality, or some aggregate or component measure of human development. Deprivation breeds discontent and a sense of injustice, which in turn lead to armed conflict.[27]

In the Philippines, during the term President Fidel V. Ramos in 1993, peace talks were initiated with the various insurgent groups. The National Unification Commission was established to develop a comprehensive program that would identify and analyze the cause of conflict and subsequently come up with a peace process proposal. The NUC conducted a public consultation wherein dialogue and meetings were conducted with different sectors of society. One of the identified root causes of Philippine internal armed conflicts was massive and abject poverty, particularly in the distribution of wealth and control over the resource base for livelihood.[28] The Ramos administration instigated economic, political and social reforms with the goal of eliminating poverty. In sync with other peace building efforts, the mass base of the communist insurgents diminished as the number of infiltrated villages or barangays dropped from 8,496 in 1988 to just 984 by 1993; and 236 Muslim rebels surrendered and gave up 188 firearms in 1998.[29] Thus, in this instance, poverty appeared to contribute to conflict and a reduction in poverty appeared to contribute to a reduction of conflict.

On the other hand, poverty may increase social discontent but it may not automatically lead to violent conflict. Confrontation with elites carries high risks for people with few material assets or socio-political connections, and demands resources

---

[26] Patricia Justino, "On the Links Between Violent Conflict and Chronic Poverty: How Much Do We Really Know," CPRC Working Paper 61 (July 2006), Institute of Development Studies , University of Sussex, UK, 3.

[27] *Philippine Human Development Report 2005*, 25.

[28] National Unification Commission, NUC Report to PRES. FIDEL V. RAMOS on the Pursuit of a Comprehensive Peace Process (Quezon City, 1 July 1993), 27.

[29] Carolina Hernandez, "The AFP's Institutional Responses to Armed Conflict: A Continuing Quest for the Right Approach," Policy Notes No. 2006-02 (March 2006), Philippine Institute for Development Studies, 5, accessed January 07, 2012, http://dirp4.pids.gov.ph/ris/pn/pidspn0602.pdf.

that they may not have.[30] People suffering from poverty may not share a common cause with elites.[31]

To examine these alternative views on the relationship between poverty and conflict in the Philippines, I derived the following hypothesis:

Hypothesis 2: Areas with high levels of poverty are likely to show high levels of armed conflict.

For this thesis, poverty shall be compared with the number of violent incidents to determine its correlation. Statistical data as presented by the NSCB are used. The poverty statistics consist of the food and poverty thresholds, the subsistence and poverty incidence, the income gap, the poverty gap, and the severity of poverty index. The estimates of subsistence and poverty incidence are expressed in terms of proportion of families and of the population.[32]

3. Good Governance

The state is given the mandate and authority to govern. It is expected to promote security, enforce justice, law and order, and provide basic services. The state has the power to enforce its mandate through the existing system of governance. The efficiency of governance is the reflection of the people's attitude towards the rulers and political institutions.[33] Failure of the state to realize the expectation of the populace may lead to resistance and unrest. Thus, good governance confers political legitimacy and it is the collective responsibility of the government, civil society and the private sector to improve the lives of the populace.[34]

---

[30] Tony Addison et al., " Chronic poverty and violent conflict: 'Fragile States' and the Social Compact," *Chronic Poverty Research Center* (July 2008), 2.

[31] Tony Addison et al., " Chronic poverty and violent conflict: 'Fragile States' and the Social Compact," 2.

[32] National Statistics Coordination Board," *Notes on the Official Poverty Statistics in the Philippines Series 2003-1,* accessed August 20, 2011, http://www.nscb.gov.ph/technotes/poverty/intro.asp.

[33] Tedd Gurr, *Why Men Rebel* (1965), 183.

[34] "National Statistics Coordination Board," *Good Governance Index,* accessed August 20, 2011, http://www.nscb.gov.ph/ggi/techNotes.asp.

Douglas Borer, in his book *Superpowers Defeated: Vietnam and Afghanistan Compared*, defines political legitimacy "as the basis for social unity, cohesion, and stability within any given polity, with the polity comprising the ruling state apparatus and the citizenry of a given territory.[35] It is expected that the ruling authority should deliver the necessary services to the people in order to maintain social order and harmony. Moreover, Borer states that "legitimacy is a function of the state's ability to govern effectively, wherein the citizens see the state's power over them as being correct and just."[36] As such, it can be said that the people's belief and trust in the government to rule them is fundamental. The state needs the acceptance and willingness of the people to be governed. Citizens should regard them as proper and deserving of support.[37]

Legitimacy can be achieved in any form of government, democratic or non-democratic. Some regimes rule by coercion and force the people to abide with its governance. For this thesis, legitimacy shall be considered as non-coercive. Regimes are not considered legitimate if compliance is based on coercion, for compliance is likely to decline when coercion is removed.[38] Borer suggests that "states that fail to acquire legitimacy at their inception and to maintain it over time will eventually fail. States can rule without legitimacy, but not well and not for long."[39]

The problem with the Philippines is the state's persistent inability to provide basic services, maintain peace and order, and promote economic development. These factors manifest the state's weakness as indicated by uncollected taxes, uncontrolled corruption, bloated bureaucracies, denuded forest, low teacher salaries and high emigration rates.[40] In the NUC report to President Fidel V Ramos, it cited in its findings that one of the root causes of internal armed conflict is poor governance, including lack of basic social

---

35 Douglas Borer, *Superpowers Defeated: Vietnam and Afghanistan Compared.* (Portland: Frank Cass Publishers, 1999). xix.

36 Douglas Borer, Superpowers Defeated: Vietnam and Afghanistan Compared. (1999). xix.

37 Tedd Gurr, *Why Men Rebel* (1965), 185.

38 Tedd Gurr, *Why Men Rebel* (1965), 185.

39 Douglas Borer, Superpowers Defeated: Vietnam and Afghanistan Compared. (1999). xix.

40 Patricio N. Abinales and Donna J. Amoroso, *State and Society in the Philippines* (Lanham, Boulder, New York, Toronto, Oxford: Rowan and Littlefield Publishers, 2005), 1.

services, corruption and inefficiency in government bureaucracy, injustice, violation of human rights, and poor implementation of laws, including those that protect the environment.[41] The society clamors for better governance: business leaders call for consistent policy implementation, urbanites for clean and affordable water, the middle class for professionalism and honesty, and the poor for a majority in a government that represents them.[42]

For this thesis, the following hypothesis for governance is tested:

Hypothesis 3: Areas with a perception of weak governance are likely to show high levels of armed conflict.

The polity is mandated to govern the state. It has been vested of powers to protect the state and provide services to the people. Failure to deliver basic services (specifically social opportunities, security, justice, law and order) leads to the populace's negative perception towards the state. For this thesis, governance shall be measured through the quantified good governance index to ascertain its effect on the levels of conflict.

This thesis shall utilize the NSCB measure of good governance and its component indices through the following dimensions: (a) sustainable management of resources through generation of adequate financial resources and responsiveness to/ alleviation of poverty; (b) rule of law through improvement of internal and external security, law enforcement and administration of justice; (c) efficiency of the delivery of services on health, education, and power supply; and (d) people's empowerment and participation.[43]

4. Literacy

The United Nations Educational, Scientific and Cultural Organization (UNESCO) define literacy as the "ability to identify, understand, interpret, create, communicate, compute and use printed and written materials associated with varying contexts. Literacy

---

41 National Unification Commission, NUC Report to PRES. FIDEL V. RAMOS on the Pursuit of a Comprehensive Peace Process, 27.

42 Patricio N. Abinales and Donna J. Amoroso, *State and Society in the Philippines,* 1–2.

43 "National Statistics Coordination Board," *Good Governance Index*, accessed August 20, 2011 *http://www.nscb.gov.ph/ggi/techNotes.asp.*

involves a continuum of learning in enabling individuals to achieve their goals, to develop their knowledge and potential, and to participate fully in their community and wider society."[44] It is believed that literacy influences the norms and culture of a society. It is also speculated that conflict and aggression are likewise influenced by literacy.

For example, a study regarding the rioting in India by Patricia Justino reveals that public expenditure on social services and improvements in education enrollments are effective means of reducing civil unrest.[45] Education and social services directly affect conflict; the higher the number of people enrolled in primary and secondary schools the lower the probability of rioting.[46] Moreover, Klaus Deninger in his research on the conflict in Uganda asserted that the probability of civil strife increases with lower levels of education and infrastructure access as well as asset endowments.[47]

In contrast to the notion that education reduces conflict, a study with the terrorists in Israel and Palestine revealed that most suicide bombers are characterized by high levels of education. Higher education and standard of living appear to be associated with membership in terror organizations such as Hamas or the Palestinian Islamic Jihad and with becoming a suicide bomber.[48] Moreover, a study in Nepal showed that education and conflict are directly proportionate—the higher the level of education, the higher the probability of conflict. Such results suggest that the higher literacy may have increased

---

[44] Mark Richmond, Clinton Robinson, and Margarete Sachs-Israel, The Global Literacy Challenge: A profile of youth and adult literacy at the mid-point of the United Nations Literacy Decade 2003–2012. *The United Nations Educational, Scientific and Cultural Organization (2008): 1,* accessed August 20, 2011, http://unesdoc.unesco.org/images/0016/001631/163170e.pdf

[45] Patricia Justino, "On the Links Between Violent Conflict and Chronic Poverty: How Much Do We Really Know," CPRC Working Paper 61 (July 2006), Institute of Development Studies , University of Sussex, UK, 11.

[46] Patricia Justino, "Redistribution, Inequality and Political Conflict". PRUS Working Paper No. 18, Department of Economics, University of Sussex, UK, 2004. Paper presented at the American Economic Association meeting in January 2005 in Philadelphia, USA.

[47] Klaus Deininger (2003), "Causes and Consequences of Civil Strife: Micro-Level Evidence from Uganda", *Oxford Economic Papers* **55**: 603.

[48] Berrebi, C. (2003), "Evidence About the Link Between Education, Poverty and Terrorism Among Palestinians", mimeo, Princeton University, 30.

awareness of rights and expectations of the people.[49] People's awareness of social problems could increase their involvement in violence.

Supporting research conducted by Willa Friedman, et al. Submitted to the National Bureau of Economic Research, asserts that that education increases acceptance of violence because it increases respondents' political knowledge and reduces their satisfaction with the status quo.[50] They argue that education can potentially enhance political consciousness which leads to an unwillingness to accept authority, and reduced satisfaction with political and economic situation.[51]

In the Philippines, little research has been done on the correlation between education and conflict. The NUC recommendations to President Ramos in the resolution of conflict focus on good governance and economic reforms. While functional literacy rate in the Philippines from 1989 to 2008 have improved from 75.4% to 86.4% (Figure 3), conflict still persists.

[49] Md Shahid Parwez, *An Empirical Analysis of the Conflict in Nepal*, NRM Working Paper Series No. 7, Asian Development Bank, July 2006, 5.

[50] Willa Friedman, et al, "Education as Liberation," *NBER Working Paper Series 16939* (April 2011): 26, accessed January 13, 2012, http://www.nber.org/papers/w16939.

[51] Willa Friedman, et al, "Education as Liberation," *NBER Working Paper Series 16939* (April 2011): 35, accessed January 13, 2012, http://www.nber.org/papers/w16939.

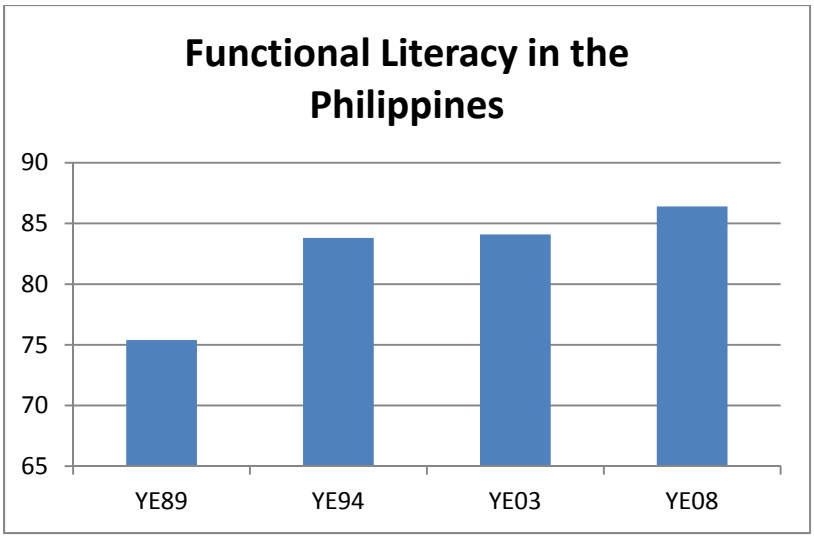


Figure 2. Functional Literacy rate from 1989 to 2008 (After National Statistics Office[52])

The following hypothesis tests the relationship between literacy and conflict:

Hypothesis 4: Areas with low levels of literacy are likely to show high levels of armed conflict.

Literacy is a means for development enabling access to opportunities and to participate in society in new ways.[53] In conflict, the illiterates are claimed to be vulnerable to recruitment and exploitation by armed groups. For this thesis, literacy shall be analyzed with the varying degree of conflict in the Philippines. The data provided by the National Statistics Coordination Board of the Philippines and the National Statistics Office shall be utilized to assess the comparative effect of literacy with armed conflict

B. OTHER VARIABLES

Conflict has been related to a range of factors that affect the behavior of the people. For this thesis, however, only four variables are analyzed mainly due to the availability of quantitative data. Other variables that were not considered but are worthy

52 National Statistics Office, The Philippines in Figures 2011 (Manila, Philipppines).

53 Mark Richmond, et al," The Global Literacy Challenge: A profile of youth and adult literacy at the mid-point of the United Nations Literacy Decade 2003–2012," 18.

of mention are relative deprivation and political control. Relative deprivation is a perceived discrepancy between men's value expectations and their value capabilities. [54] On the other hand, political control is a calibrated level of authority essential to attain socio-political stability[55] (see additional information in Appendix A).

[54] Tedd Gurr, *Why Men Rebel,* (Princeton: Princeton University Press, 1965), 13.

[55] Gordon McCormick (2011 January). The Political Control and Societal Equilibrium Model. Monterey, CA: Lecture presented during Dr. McCormick's Seminar on Guerrilla Warfare.

THIS PAGE INTENTIONALLY LEFT BLANK

III. RESEARCH DESIGN

Keep in mind that the ultimate normative purpose of this kind of conflict analysis is to help all of us – political activists, policy makers, and scholars- understand how to build a more just and peaceful societies.

– Ted Gurr[56]

A. RESEARCH QUESTION AND HYPOTHESES

The research is a case study of the Philippines to identify the determinants of conflict. A number of assertions have been made on the relationships of conflict with the other variables. Conflict is caused by poverty, lack of good governance,[57] clash of civilizations due to societal and ethnical differences,[58] and the lack of literacy.

For this thesis four independent variables are considered: ethnicity, poverty, literacy, and governance. They give rise to the following hypotheses.

Hypothesis 1: Areas with a high level of ethnic diversity are likely to show high levels of armed conflict.

Hypothesis 2: Areas with high levels of poverty are likely to show high levels of armed conflict.

Hypothesis 3: Areas with a perception of weak governance are likely to show high levels of armed conflict.

Hypothesis 4: Areas with low levels of literacy are likely to show high levels of armed conflict.

B. VARIABLES

This thesis identifies one dependent variable and four independent variables. The dependent variable is armed conflict. Armed conflict is often referred to as war between

---

[56] Tedd Gurr, *Why Men Rebel* (1965), xiv.

[57] Dan Smith, Trends and Causes of Armed Conflict, *Berghof Research Center for Constructive Conflict Management* (2004), 7, Accessed December 08, 2011, http://www.berghof-handbook.net/documents/publications/smith_handbook.pdf.

[58] Samuel P Huntington, "The Clash of Civilizations," *Foreign Affairs 72 (3, Summer),* 25.

two opposing states, or between governmental forces and non-governmental forces.[59] In the Philippines, conflict is primarily intrastate and involves various insurgents, secessionists and terrorists groups fighting against the government. This thesis measures conflict through the reported significant activities (Sigacts) conducted in a given year. Significant activities (Sigacts) are violent acts committed by the CPP/NPA, MILF and ASG which involves armed clashes, assassination, murder, kidnapping, arson, ambush, raid, bombing, shooting and harassments.

The independent variables are ethnic diversity, poverty, good governance and literacy. Ethnic diversity refers to the variation of culture, language, race and religion in a given area. It is sometimes referred to as multiculturalism. The Philippines is considered to be the 8th most multiethnic region in the world.[60] Poverty refers to the lack of basic human needs, which commonly includes clean and fresh water, nutrition, health care, education, clothing and shelter.[61] Governance refers to the process of decision-making and the process by which decisions are implemented or not implemented by an authoritative body.[62] It is a term commonly used in development literature.[63] In the Philippines good governance is measured based on the socio-economic performance of the government. Literacy refers to the ability to identify, understand, interpret, create, communicate, compute and use printed and written materials.[64] For this thesis functional

---

[59] International Committee of the Red Cross (ICRC), *How is the Term "Armed Conflict" Defined in International Humanitarian Law?*, March 2008, accessed May 16, 2012, http://www.unhcr.org/refworld/docid/47e24eda2.html

[60] Wikipedia contributors, "Multiculturalism," *Wikipedia, the Free Encyclopedia*, accessed May 2, 2012, http://en.wikipedia.org/w/index.php?title=Multiculturalism&oldid=490231702.

[61] Wikipedia contributors, "Poverty," *Wikipedia, the Free Encyclopedia* , accessed May 11, 2012, http://en.wikipedia.org/w/index.php?title=Poverty&oldid=490961276.

[62] "What Is Good Governance" (UN Economic and Social Commission for Asia and the Pacific, 2012), accessed May 11, 2012, http://www.unescap.org/pdd/prs/ProjectActivities/Ongoing/gg/governance.asp.

[63] "What Is Good Governance" (UN Economic and Social Commission for Asia and the Pacific, 2012), accessed May 11, 2012, http://www.unescap.org/pdd/prs/ProjectActivities/Ongoing/gg/governance.asp.

[64] Mark Richmond, Clinton Robinson, and Margarete Sachs-Israel, The Global Literacy Challenge: A profile of youth and adult literacy at the mid-point of the United Nations Literacy Decade 2003–2012. *The United Nations Educational, Scientific and Cultural Organization (2008): 1,* accessed August 20, 2011, http://unesdoc.unesco.org/images/0016/001631/163170e.pdf

literacy shall be used in the analysis rather than basic literacy. Functional literacy refers to the people 10 years old and over with the ability to communicate effectively, to solve problems scientifically and to think critically and creatively.[65]

C. DATA

This research utilizes primarily empirical data. The in-country variation within the Philippines enables me to test key variables that are thought to be related to armed conflict. Quantitative data on ethnicity, poverty, literacy and good governance have been obtained mainly from the National Statistics Office and the National Statistics Coordination Board of the Philippines. The datasets used were based on their availability for assessment periods made by NSCB and NSO. For example, poverty incidence is measured every three years. As such, selected years for poverty are 2003 and 2006. For good governance available data are for the years 2005 and 2008. For literacy, available data are for 2003 and 2008. The data are then processed through different statistical methods. Bivariate and multivariate statistical analyses were conduced to identify the relationship between the independent variables with the dependent variable conflict. Bivariate analysis relied on descriptive statistics while the multivariate analysis relied on Stata and OpenGeoda software. All variables were then projected on map overlays with the use of the ArcGIS in order to visually display the relationship of the dependent variables with conflict.

Data on insurgency and terrorism-related activities are from the archives of the Armed Forces of the Philippines and the CORE Lab of the Naval Postgraduate School. The data were based on daily operations reports as transmitted by tactical units to the AFP General Headquarters. Acts perpetrated by criminal elements and not linked to any of the insurgents, secessionists, and terrorists were omitted.

---

65 "What is Literacy," DepEd Literacy Coordinating Council, accessed April 06, 2012, http://lcc.deped.gov.ph/lcc/index.php?

D. ANALYSIS.

1. Bivariate Statistical Analysis

Descriptive statistics are the principal analytical tools to infer relationships between the independent and dependent variables. The value of the dependent variable is analyzed as values of the independent variables vary. Statistical analysis on the data was made in two steps. For the first step, scatter plots of the data were projected with the linear regression equation line showing the slopes and correlations of the plot. The correlation of variables could be visually observed through the linear trend of the scatter plot but we need its value. For correlation values, ρ, between -1 and 1 I used the following guidelines. If $|\rho|>0.8$ there is a strong linear relationship, $0.5<|\rho|<0.8$ there is a moderate linear relations and $|\rho|<0.5$ there is a weak linear relationship. For the second step, each dataset was separated in two groups somewhat arbitrarily. The mean and standard deviation of each group were then determined. Since the intent is to compare the means and sample n is large, the central limit theorem allows the z-test to be used for hypothesis testing.[66] Test statistics to compare the groups were calculated using the following formula

$$z = \frac{\bar{x} - \bar{y}}{\sqrt{\left(\frac{\sigma_X^2}{m}\right) + \left(\frac{\sigma_y^2}{n}\right)}}$$

wherein

$\bar{x}$ = mean of x
$\bar{y}$ = mean of y
σ_X^2 = sample variance of x
σ_y^2 = sample variance of y
m = nr of samples of x
n = nr of samples of y

[66] The "central limit theorem states that the sum of a large number of independent observations from the same distribution has, under certain general conditions, an approximate normal distribution." ("Central Limit Theorem in Statistics", accessed April 16, 2012, http://www.stattucino.com/berrie/clt.html).

Upon determining the value of z, it would then be subjected to a one-tailed test to establish the validity of the null hypotheses.[67]

In partitioning the data, several trials were made to validate if there would be changes in the value of z. Changes in the value of z might yield conflicting results when subjected to a one-tailed test. The partition that yields statistically significant results, was the one chosen to represent the partitioned data. The separation was made based on the variables' effect to be statistically significant if the probability (p-value) that it could have occurred by random chance falls below a particular threshold which is usually .05. If the p-value of the variable's coefficient falls below .05 ($p < .05$), then the probability that the result could occur by random chance is less than 5%.[68] The partitioned data with the p-value of less than .05 were selected to be processed and analyzed.

Data on the levels of poverty, good governance, and literacy were drawn from the archives of NSCB and plotted directly with the Sigacts. For ethnic diversity, ethnic groups per province were recorded and measured through the index of ethno-linguistic fractionalization (ELF). Considering a society composed of $K \geq 2$ different ethnic groups, and letting P_k indicate the share of group k in the total population, the value of the ELF index is given by[69]

$$1 - \sum_{k=1}^{k} P_k^2$$

[67] A one-tailed test is a statistical test in which the critical area of a distribution is one-sided so that it is either greater than or less than a value, but not both. If the tested sample falls into the one-sided critical area, the alternative hypotheses shall be accepted rather than the null hypotheses. ("One-Tailed Test", Investopedia, accessed March 04, 2012, http://www.investopedia.com/terms/o/one-tailed-test.asp)

[68] Sean F Everton, *Disrupting Dark Networks*, Cambridge, UK: Cambridge University Press (2012), 310.

[69] Walter Bossert, Conchita D'Ambrosio, and Eliana La Ferrara, "A Generalized Index of Ethno-Linguistic Fractionalization," (June 2005): 1, accessed April 02, 2012, http://www-3.unipv.it/webdept/prin/workpv02.pdf.

The ELF index is simple to compute because all it needs is a vector of shares of the various groups in the population. In essence, it captures the probability that two randomly drawn individuals from the population belong to different ethnic groups.[70]

2. Multivariate Analysis

In addition to bivariate analysis, multivariate analyses are conducted in order to analyze and observe the relationship of ethnic diversity, poverty, literacy and good governance with Sigacts in a given period of time. Multivariate analysis was used in order to separate genuine from spurious correlations and gain a better understanding of the sources of conflict. Since the outcome variable is a count of Sigacts by province, count models are preferred over ordinary least squares (OLS) models for estimating the coefficients.[71] After comparing a series of count models (i.e., poisson, negative binomial, zero inflated poisson, and negative zero inflated negative binomial) using the countfit program developed by Long and Freese,[72] it was determined that a negative binomial regression model provided the best fit of the data.[73] The p-value of each of the estimated coefficients are then evaluated in terms of its statistical significance (bootstrap standard errors are used since these data are not a random sample). That is, when a coefficient's p-value falls below .05 ($p < .05$) we can conclude that the possibility that the result could occur by random chance is less than 5%.

---

[70] Bossert et al., "A Generalized Index of Ethno-Linguistic Fractionalization," 1.

[71] See J. Scott Long. 1997. *Regression Models for Categorical and Limited Dependent Variables*. Advanced Quantitative Techniques in the Social Sciences Series. Thousand Oaks, CA: Sage Publications. Also see J. Scott Long and Jeremy Freese. 2006. *Regression Models for Categorical Dependent Variables Using Stata*. 2nd ed. College Station, TX: Stata Press.

[72] The program, implemented for use in Stata, generates a table of estimates, a table of observed and average estimated probabilities (and a graph of these differences), and a series of tests and measures of fit to compare the models. See J. Scott Long and Jeremy Freese. 2006. *Regression Models for Categorical Dependent Variables Using Stata*. 2nd ed. College Station, TX: Stata Press, pp. 409-413. See also J Bruin, "Newtest: Command to Compute New Test," *UCLA Academic Technology Services, Statistical Consulting Book*, 2006, http://www.ats.ucla.edu/stat/stata/faq/countfit.htm.

[73] I used the Stata statistical package to estimate the model. See StataCorp. 2009. *Stata Statistical Software: Release 11*. College Station, TX: StataCorp LP.

3. Geospatial Analysis

The analysis of spatial data has played a significant role in the quantitative scientific tradition in geography.[74] Several publications and research has been devoted to the conduct of analysis in the advent of Geographic Information Systems (GIS) software. For this thesis, two geospatial analytical tools were used, ArcGIS to plot the maps and identify the density hotspots, and OpenGeoda to estimate geospatial weighted regression models. For ArcGIS, a data-driven approach was made in order to derive information on spatial pattern, spatial structure, and spatial interaction.[75] The independent variables are projected on to a province-level map and color coded by its index score. Sigacts are then plotted in terms of density hotspots. Further statistical analysis is then conducted with OpenGeoda, which is a statistical package that allows analysts to control for geospatial effects.[76] Unfortunately, currently the package only estimates geospatial models based on OLS and not count models; thus, we should be cautious in drawing conclusions in this portion of the analysis. For each year in which Sigacts data are available, a standard OLS model, a spatial lag model, and a spatial error model are estimated,[77] and the model that provides the best fit of the data is chosen for analysis.[78]

---

[74] Luc Anselin, *What Is Special About Spatial Data?: Alternative Perspectives on Spatial Data Analysis* ([Santa Barbara, Calif.]: National Center for Geographic Information and Analysis, 1989).

[75] Luc Anselin, *What Is Special About Spatial Data?: Alternative Perspectives on Spatial Data Analysis*

[76] Luc Anselin, *What Is Special About Spatial Data?: Alternative Perspectives on Spatial Data Analysis*.

[77] The spatial lag and spatial error models are based upon the OLS model, but they control for geospatial effects (i.e., spatial autocorrelation). In particular, the spatial error model assumes that spatial autocorrelation occurs in the regression equation's error term, while the spatial lag model assumes that it is a function of the dependent variable.

[78] The Akaike info criterion (AIC) and Schwarz criterion, where lower values indicate fit, are used to establish model fit. The log likelihood index of each model, where higher values indicate a better fit, is also used. See *Spatial Regression in OpenGeoDa*, 2010. , contributed by DoHazards, accessed April 24, 2012, http://www.youtube.com/watch?v=5YXSwVLT4mI&feature=youtube_gdata_player.

THIS PAGE INTENTIONALLY LEFT BLANK

IV. ANALYSIS

> *"Peace is not the absence of conflict but the presence of creative alternatives for responding to conflict -- alternatives to passive or aggressive responses, alternatives to violence."*
>
> – Dorothy Thompson

A. INTRODUCTION

This chapter begins with a series of bivariate analyses that compare the key independent variables identified in the previous chapter (i.e., ethnic diversity, poverty, good governance, and literacy) with the levels of conflict (i.e., Sigacts) at the provincial level. Each section begins with a brief description of the variable; and then its association with conflict is examined using statistical techniques and hotspot geospatial analysis. The analysis then turns to a multivariate analysis of these variables in relation to conflict. Negative binomial and geospatial regression models are estimated to separate genuine from potentially spurious associations. The chapter concludes with a brief summary of results.

B. BIVARIATE ANALYSIS

1. Ethnic Diversity

The Philippines is a highly heterogeneous country (see Figure 3). Its major population is composed of ethnolinguistic groups whose language is of Malayo-Polynesian origin.[79] Major ethnic groups are Tagalog 28.1%, Cebuano 13.1%, Ilocano 9%, Bisaya/Binisaya 7.6%, Hiligaynon Ilonggo 7.5%, Bicol 6%, and Waray 3.4% (2000 census).[80] Major religions in the country are Catholic 82.9%, Muslim 5%, Evangelical 2.8%, Iglesia ni Kristo 2.3%, other Christian 4.5%, other 1.8%, unspecified 0.6%, and no

[79] Ethnic Groups in the Philippines, Wikipedia, accessed February 02, 2012, http://en.wikipedia.org/wiki/Ethnic_groups_in_the_Philippines.

[80] CIA Factbook, accessed January 25, 2012, https://www.cia.gov/library/publications/the-world-factbook/geos/rp.html.

religion 0.1% (2000 census).[81] Every ethnic group in the Philippines generally practices the same religion, speaks the same dialect, dwells in the same region, and has its distinct customs and traditions. Muslims mostly inhabit the southern island of Mindanao.

The Philippines is probably the most colonized country in Southeast Asia.[82] Its multiethnicity is mainly due to its foreign and colonial inheritances. During the Spanish colonization era most ethnic groups converted to Christianity. The Spaniards utilized various Catholic orders to control the society and politics, and with most Filipinos, Catholicism became the unifying factor when sovereignty and nationality were on the agenda.[83]

Multiethnicity can pose a special challenge to any system of governance for it can amplify a society's ethnic cleavages (see Figure 3).[84] Grievances in response to discrimination and marginalization can lead to ethnic violence. In the Philippines, Muslims have never considered themselves to be colonized by any foreign entity. They resisted the Spanish and American rule through a series of uprisings and rebellions. They have been clamoring for secession and during the American era attempted to establish a political entity independent from the Philippines. However, the Muslim regions were still included in the Christian-dominated republic.[85]

---

[81] CIA Factbook, accessed January 25, 2012, https://www.cia.gov/library/publications/the-world-factbook/geos/rp.html.

[82] Peter Kreuzer, "Democracy, Diversity and Conflict, Managing Ethnic Divisions in the Philippines and Malaysia," *Cornell University Peace Studies Program Occasional Paper #30-4* (2006): 4.

[83] Peter Kreuzer, "Democracy, Diversity and Conflict, Managing Ethnic Divisions in the Philippines and Malaysia," 4.

[84] Peter Kreuzer, "Democracy, Diversity and Conflict, Managing Ethnic Divisions in the Philippines and Malaysia," 2.

[85] Peter Kreuzer, "Democracy, Diversity and Conflict, Managing Ethnic Divisions in the Philippines and Malaysia," 46.

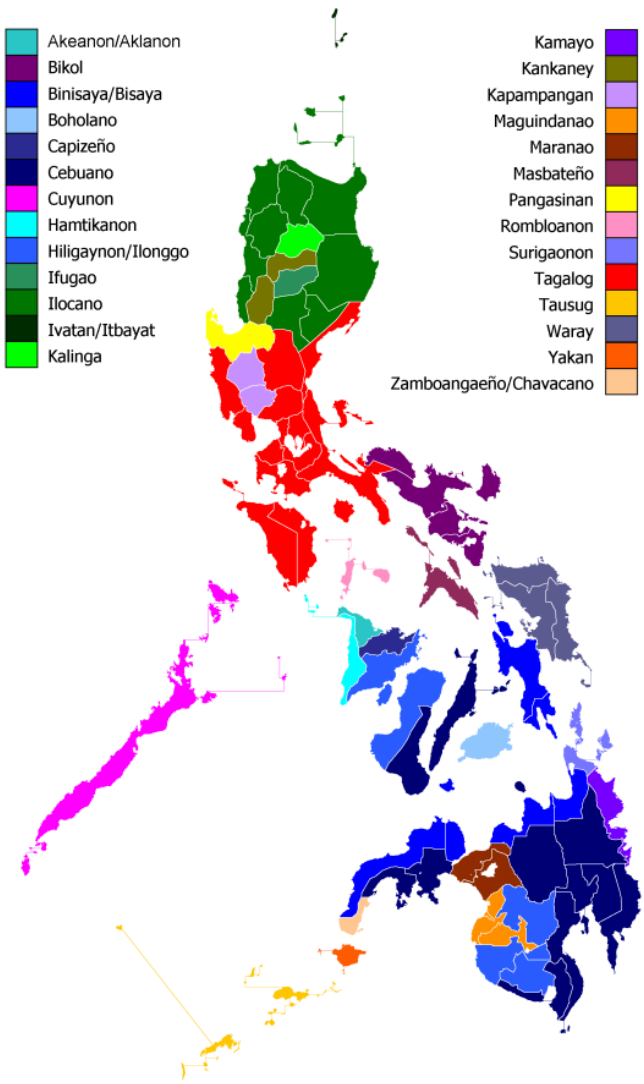


Figure 3. Philippine Ethnic Groups by Province (From Wikipedia[86])

A democratic setting is generally believed to be in a better position to moderate the escalatory tendencies inherent in multiethnic settings.[87] Democracy allows for better representation of minority groups. Local representatives are elected, which increases the likelihood that ethnic groups will be represented and their concerns addressed. The

86 "Philippines," Wikipedia, accessed February 02, 2012. http://en.wikipedia.org/wiki/File:Philippine_ethnic_groups_per_province.PNG

87 Peter Kreuzer, "Democracy, Diversity and Conflict, Managing Ethnic Divisions in the Philippines and Malaysia," 4.

Philippines is a fully democratic country. Even though democratic rule was suppressed under the nine-year martial rule law of Ferdinand Marcos, it was restored after the fall of the dictator by a bloodless "people power" revolution.

Some may find it surprising to learn that the Philippines has one of the world's most wide-ranging laws protecting the rights of indigenous people.[88] The Indigenous Peoples Rights Act, which was passed into national law in 1997 seeks to recognize, promote and protect the rights of indigenous peoples (IP). These include the right to ancestral domain and lands; rights to self-governance and empowerment, social justice and human rights; and the right to cultural integrity. [89]

a. Hotspot (Geospatial) Analysis

Using ArcGIS the ELF scores were plotted geospatially for both 2003 and 2005. In 2003, it can be seen that density hotspots were located in ethnically diverse areas of Mindanao. However, conflict is still observed in areas with low ethnic diversity scores (Figure 4). A similar pattern is observed for 2005 (Figure 5). Hotspots were located mostly in provinces with high ethnic diversity scores (darker colored provinces). Further examination found that conflict also occurred in provinces with lower levels of ethnic diversity. This suggests that a positive association exists between ethnic diversity and levels of conflict. This association is explored statistically next.

[88] Peter Kreuzer, "Democracy, Diversity and Conflict, Managing Ethnic Divisions in the Philippines and Malaysia," 40.

[89] Indigenous People's Rights Act (IPRA of 1997), on the homepage of the National Commission on Indigenous Peoples (NCIP), accessed January 20, 2012, http://www.Ncip.gov.ph/mandate/ipra.htm.

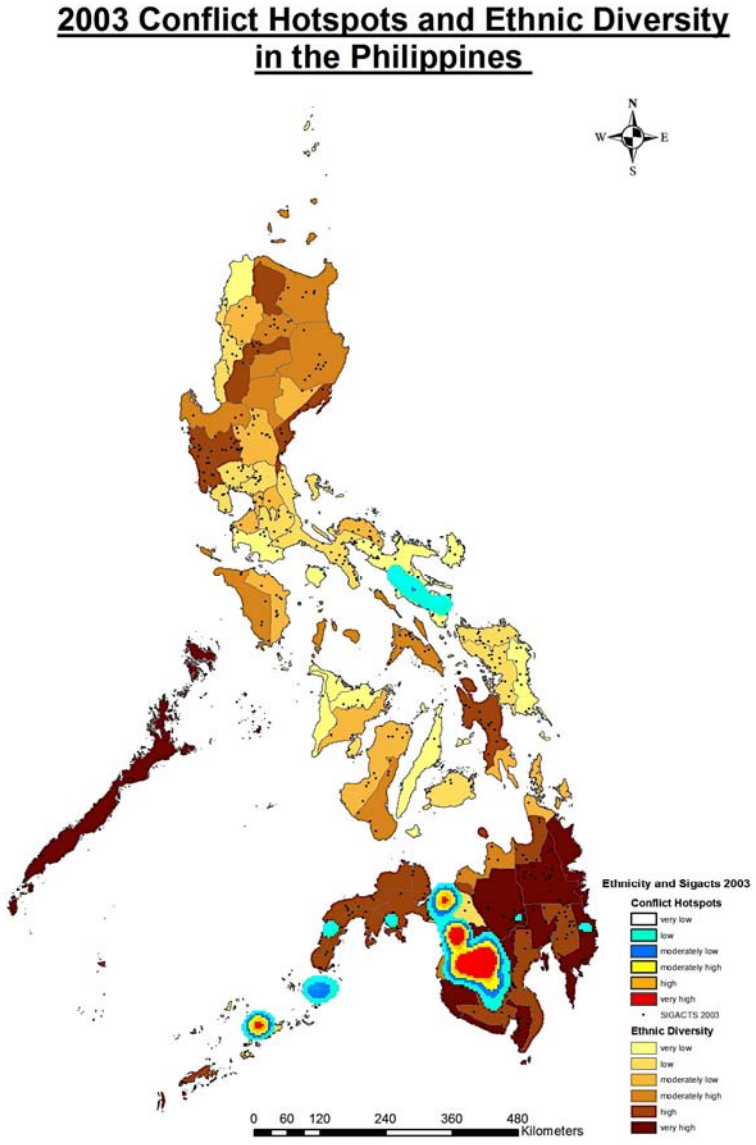


Figure 4. Conflict hotspots and ethnic diversity for 2003

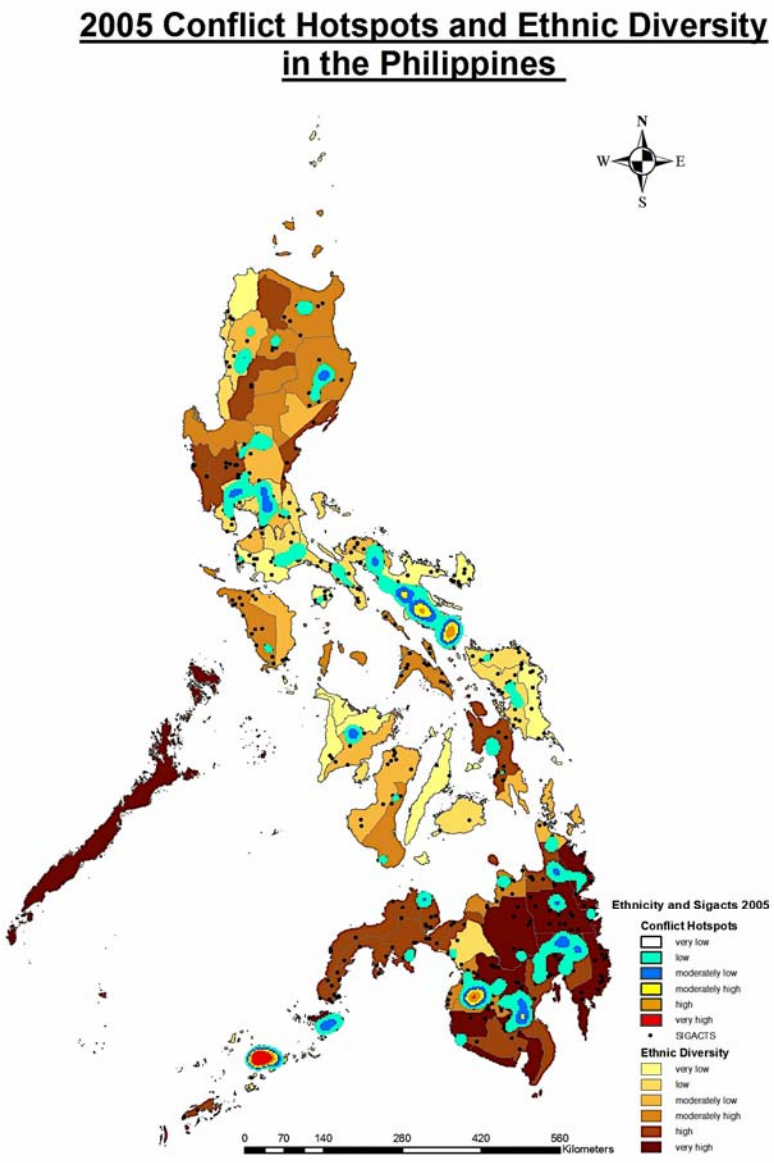


Figure 5. Conflict hotspots and ethnic diversity for 2005

b. Statistical Analysis

To analyze conflict and ethnic diversity in the Philippines, data on ethnicity and significant acts (Sigacts) were gathered, projected onto a scatter plot, and analyzed. Sigacts are activities related to insurgency and ethnic violence. In 2003 1,355 violent incidents were recorded including armed clashes, assassination, murder,

kidnapping, arson, ambush, raid, bombing, shooting and harassments. The incidents are either initiated by terrorists/insurgents or by government forces. They are plotted against the ELF index discussed in the previous chapter.

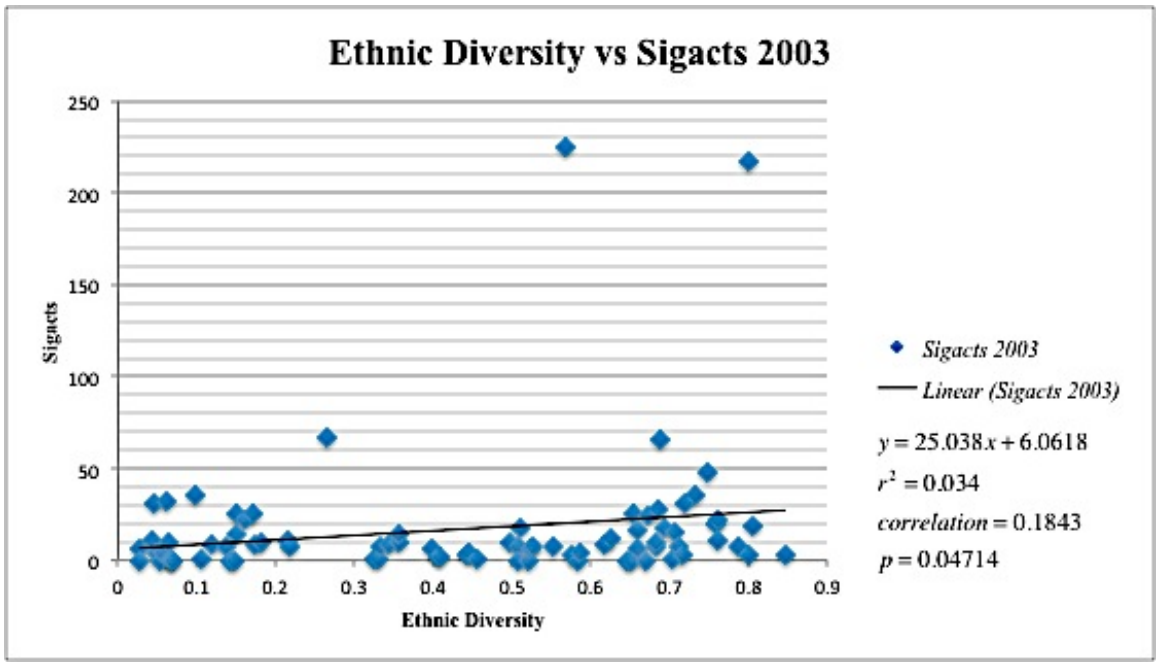


Figure 6. Scatter plot of Ethnic Diversity and Sigacts 2003

It can be observed from Figure 6 that in 2003 as ethnic diversity increases, so did the level of conflict although as indicated by the linear regression equation line, the association is marginal with a statistically significant correlation of 0.184 and an r^2 of 3.4%.[90] The Sigacts counts of North Cotabato and Maguindanao are 217 and 225, respectively (compared to a mean of 23.22), suggesting that they are outliers. Their outlier status is quite obvious in Figure 6. The provinces lie adjacent to one other and conflict in these provinces is mainly attributed to the MILF. The outliers exert considerable influence on the relationship between the two variables. Excluding them

[90] R^2 indicates how much of the observed variance in the dependent variable is accounted for by the independent variables in the equation. Thus, in 2003 ethnic diversity accounts for 3.4% of the variation in conflict.

lowers the correlation coefficient from 0.184 to 0.116. Moreover, Maguindanao has an ethnic diversity score of 0.568 while North Cotabato has a score of 0.801, both of which are above the mean of 0.435.

To further tease out the relationship between conflict and ethnic diversity, the data were divided into two groups based on ethnic diversity score: one group with an ethnic diversity score of less than 0.49, and the second group with more than 0.49. The hypotheses for a two sample group to compare means of the two groups was formulated as follows:

$$H_o : u1 - u2 = 0$$
$$H_a : u1 < u2$$

The null hypothesis (Ho) holds that both groups would have the same number of Sigacts with *u1* being the group with lower ethnic diversity. Meanwhile, the alternate hypotheses would state that the group with higher ethnic diversity has higher number of Sigacts. Descriptive statistics of the two groups are as follows:

$\bar{x}$ =	10.333	mean of group one
$\bar{y}$ =	23.220	mean of group two
σ_X^2 =	178.018	sample variance of group one
σ_y^2 =	2,244.726	sample variance of group two
m =	39	nr of samples of group one
n =	41	nr of samples of group two

A t-test indicates that the value of z = -1.67. For a one-tailed test at 5% significance level the value of z reveals that it is within the rejection region. Since -1.67 < -1.65 and is within the rejection region (see Figure 7), we can reject the null hypothesis and conclude that the mean for group two is greater than the mean of group one at α=0.05. This provides additional evidence that in 2003 as ethnic diversity increased, so did Sigacts.

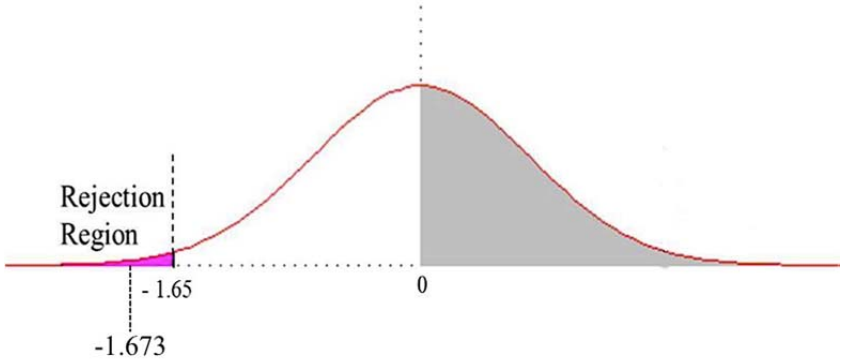


Figure 7. One-tailed Test for Ethnic Diversity and Sigacts 2003

In 2005, Sigacts declined somewhat to 998 recorded incidents. Here, the relationship (Figure 8) between the two variables is weaker with a statistically insignificant correlation of 0.022 (note that the regression line appears to be flat), which translates into an r^2 value of 0.05% (0.022^2). Figure 6 indicates the existence of an outlier, which in this case is Sulu. In 2005 Sulu had 80 Sigacts and an ethnic diversity score of 0.265, both of which differ significantly from their means.

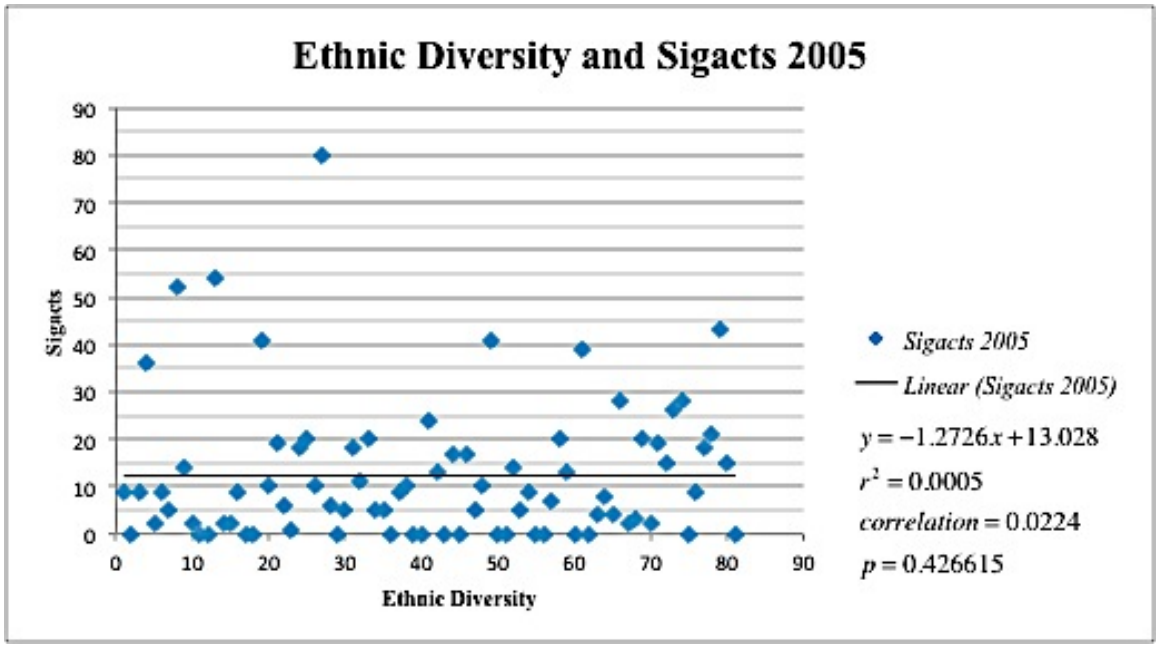


Figure 8. Scatter plot of Ethnic Diversity and Sigacts 2005

As before we used the ethnicity score to partition the results into two groups: one with ethnic diversity scores of less than 0.49 and one with scores of more than or equal to 0.49 (Appendix B). Descriptive statistics of the two groups are as follows:

$\bar{x}$ =	12.171	mean of group one
$\bar{y}$ =	12.795	mean of group two
σ_X^2 =	143.995	sample variance of group one
σ_y^2 =	306.115	sample variance of group two
m =	41	nr of samples of group one
n =	39	nr of samples of group two

A t-test yields a value of z = -0.1852. For a one-tailed test at 5% significance level the value of the test statistic z is within the fail to reject region (Figure 9). Since -0.1852 > -1.65 does not fall within the rejection region, the null hypothesis cannot be rejected and thus we are forced to conclude that the mean for group one is equal to the mean for group two and that ethnic diversity had no statistically significant effect on Sigacts in 2005. Moreover, in partitioning the data, several trials were made to validate if there would be changes in the value of z. The trial revealed that the p-value of ethnic diversity for 2005 is always greater than 0.05. This indicates that in 2005 the level of conflict was unaffected by ethnic diversity.

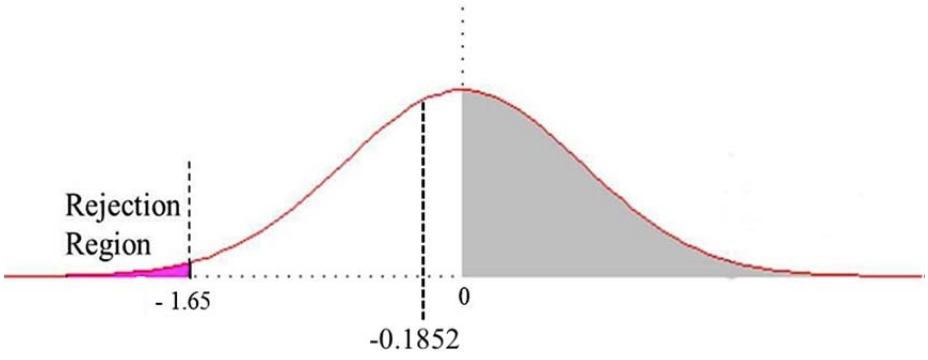


Figure 9. One-tailed Test for Ethnic Diversity and Sigacts 2005

2. Poverty

The population of the Philippines for 2010 was estimated to be 92.3 million. It has grown from 76.5 million in the year 2000, with an annual growth rate of 2.36%, and 88.6 million in the year 2007, with an annual growth rate of 2.04%.[91] The high population growth, lack of jobs, and underemployment contributed to a 33.7 % poverty rate in 2003.[92] Income was distributed unevenly wherein the poorest 10 % of the population controls only 1.7% of the national income while the top 10 % of the population controls 38.4 %.[93] Many families rely on remittances from the seven million Filipinos living abroad who, in recent years, have sent home $6-7 billion annually.[94]

Following reconstruction after World War II, the Philippines was one of the richest countries in Asia.[95] However, economic mismanagement and political volatility during the Marcos regime, and political instability during the Corazon Aquino administration contributed to economic stagnation and further dampened economic activity.[96] A broad range of reforms was implemented by subsequent administrations to improve economic growth and attract foreign investments

Since the year 2000, the Gross Domestic Product (GDP) has generally increased except in 2009, when the GDP was at its lowest at 1.1% (Figure 10). However, it bounced back to 7.3% in 2010 and went down to 4% by 2011.[97]

---

[91] National Statistics Coordination Board," *Population Statistics,* accessed March 13, 2012, http://www.nscb.gov.ph/secstat/d_popn.asp

[92] Abinales and Amoroso, *State and Society in the Philippines*, 16.

[93] Abinales and Amoroso, *State and Society in the Philippines*, 16.

[94] Abinales and Amoroso, *State and Society in the Philippines*, 16.

[95] "Philippines," US Department of State, accessed April 7, 2012 http://www.state.gov/r/pa/ei/bgn/2794.htm

[96] "Philippines," US Department of State, accessed April 7, 2012 http://www.state.gov/r/pa/ei/bgn/2794.htm

[97] CIA Factbook, accessed March 13, 2012, https://www.cia.gov/library/publications/the-world-factbook/geos/rp.html.

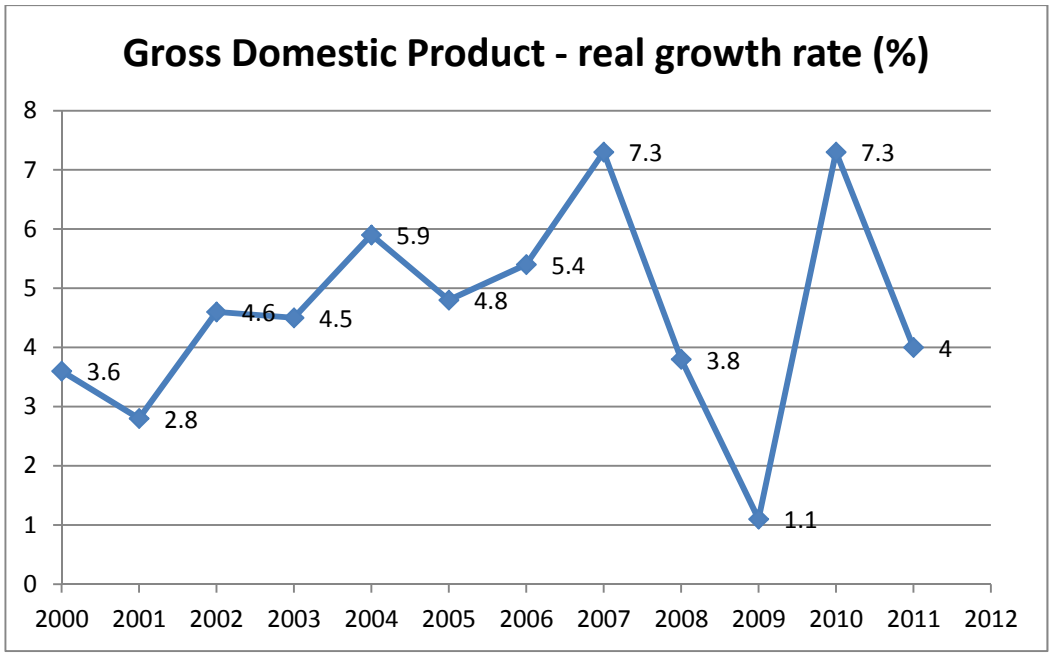


Figure 10. Philippines GDP-real growth rate from 2000 to 2011 (After Index Mundi[98])

From 2000 to 2011, the Philippine economy was relatively stable. It was able to weather the 2008–2009 global recession better than other countries in the region mainly due to minimal exposure to troubled international securities, lower dependency on exports, relatively resilient domestic consumption, large remittances from overseas Filipino workers, and a growing business-process outsourcing industry.[99] But despite of the stability, growth remains restricted. The country failed to develop domestic human capital. Not enough jobs were created and unemployment remained high.

Other factors that restricted the growth of the economy are the huge deficits caused mainly by massive domestic and foreign debt, and the state's inability to collect taxes. Due to limited government resources, social needs remained unmet which fuelled political instability, which consequently discouraged foreign investment.[100]

---

[98] Index Mundi, accessed March 13, 2012, http://www.indexmundi.com/g/g.aspx?c=rp&v=66. This entry gives GDP growth on an annual basis adjusted for inflation and expressed as a percent.

[99] CIA Factbook, accessed March 13, 2012, https://www.cia.gov/library/publications/the-world-factbook/geos/rp.html.

[100] Abinales and Amoroso, *State and Society in the Philippines*, 16.

a. Hotspot (Geospatial) Analysis

Poverty is one of a number of factors that may contribute to violent conflict. It has been asserted that poverty is one of the main causes of insurgency. To analyze conflict and poverty in the Philippines, ArcGIS was used to plot provincial poverty index scores for both 2003 and 2006. For 2003, it can be observed that conflict (Sigacts) density hotspots are located in high-poverty areas (i.e. darker areas on the map), specifically in Mindanao (Figure 11). By contrast for the year 2006 (Figure 12), the ArcGIS map shows that conflict hotspots mostly occurred in areas with high and low poverty areas although more appears to occur in the higher poverty areas. Taken together this analysis suggests that poverty is positively associated with conflict. We test this below using bivariate statistical techniques, although we hold off final judgment until the multivariate analyses later in the chapter.

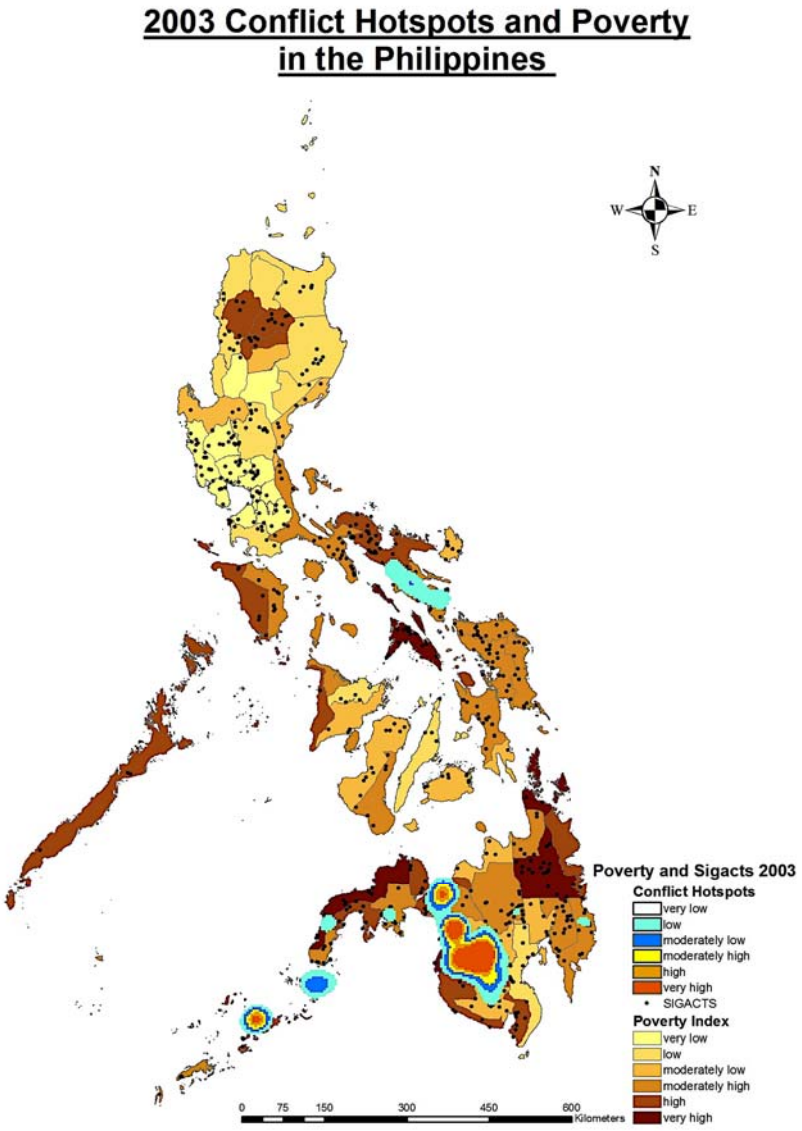


Figure 11. Conflict hotspots and poverty for 2003

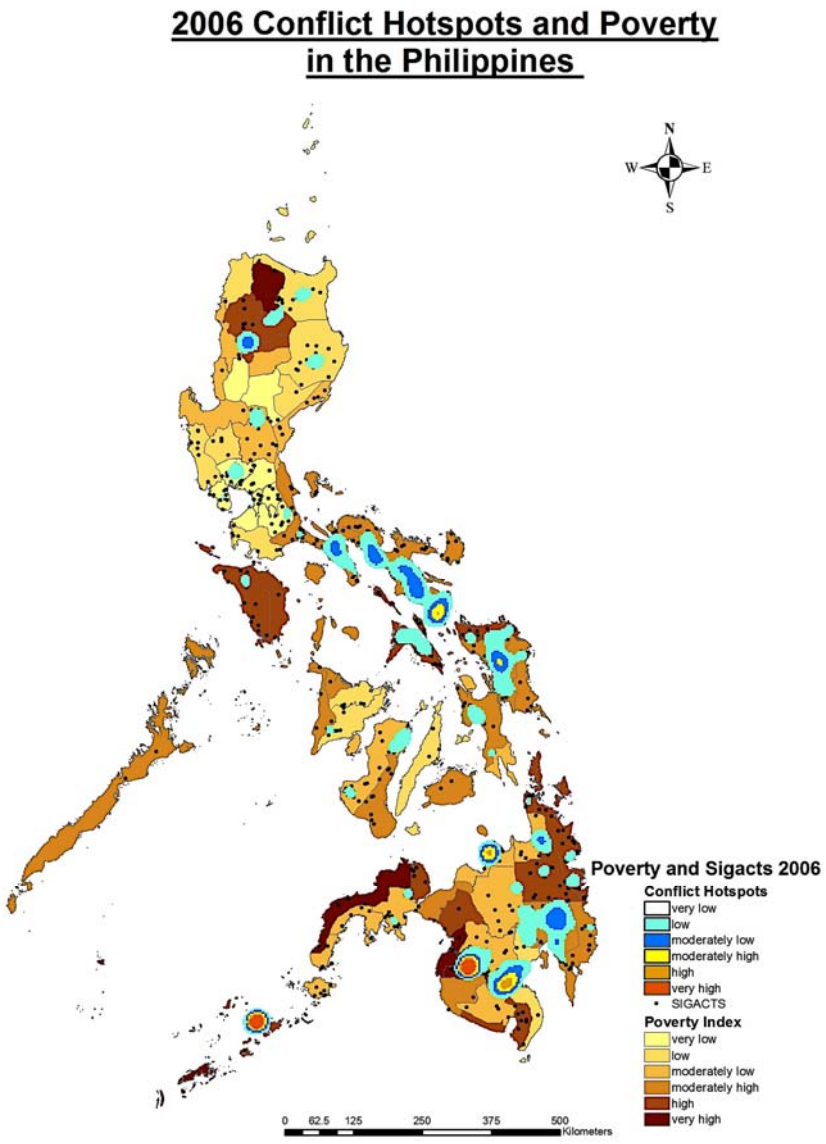


Figure 12. Conflict hotspots and poverty for 2006

b. Statistical Analysis

To further analyze the relationship between conflict and poverty, data on poverty and significant acts were projected on a scatter plot (Figure 13).

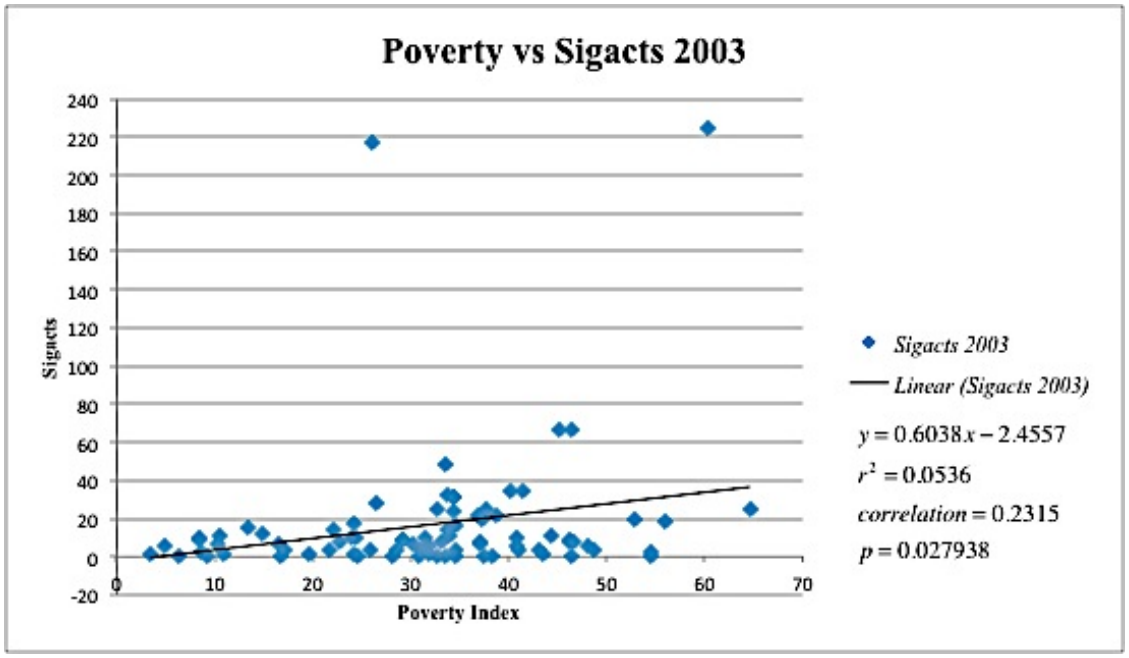


Figure 13. Scatter plot of Poverty and Sigacts 2003

It can be observed from Figure 13 that Sigacts increased as poverty increased. The linear correlation of 0.232 reflects a somewhat strong (and statistically significant) linear relationship between these two variables. It indicates that poverty explains 5.36% (0.232^2) of the observed variance in conflict. As we saw earlier North Cotabato and Maguindanao were considered outliers with their high Sigacts counts. Descriptive statistics shows that poverty has a mean of 31.77 and a median of 33.5, while Sigacts have a mean of 16.7 and a median of 8 (Appendix D).

The poverty-index data were used to partition the observations into two groups: one with poverty-index scores of less than 28 and a second with scores of 28 or more. Descriptive statistics reveals the following values:

$\bar{x}$ =	12.103	mean of group one
$\bar{y}$ =	21.537	mean of group two
σ_X^2 =	1,177.937	sample variance of group one
σ_y^2 =	1,333.305	sample variance of group two
m =	39	nr of samples of group one
n =	41	nr of samples of group two

T-test analysis yields a *z* value of 1.19, which with a one-tailed test at 5% significance level, does not fall within the rejection region (i.e., 1.19 < 1.65). Therefore, we cannot reject the null hypothesis and are forced to conclude that the mean of group one is equal to the mean for group two at α=0.05. Thus, in 2003 we cannot conclude with confidence that conflict is positively associated with poverty. Nevertheless, because the correlation coefficient between the two variables is positive and statistically significant, we cannot outright reject the possibility that there is a positive association between the two factors.

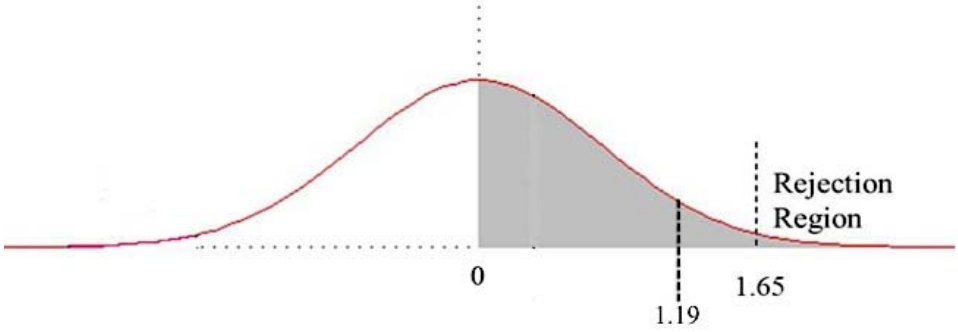


Figure 14. One-tailed Test of Poverty and Sigacts 2003

In 2006, there were 1,091 recorded Sigacts (Figure 15). The correlation coefficient attests that the relationship among the variables is 0.209, which is a moderately positive (and statistically significant) relationship between the variables, one that indicates that poverty accounts for 4.38% of observed variation in conflict.

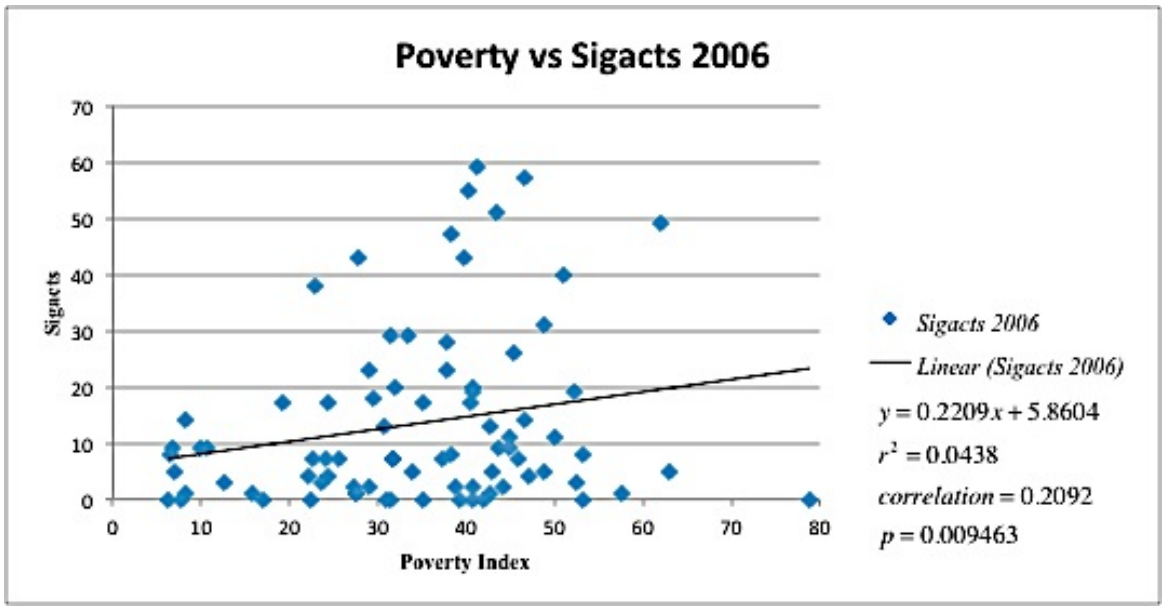


Figure 15. Scatter plot of Poverty and Sigacts 2006

The poverty index for 2006 was used to partition the provinces into two groups: one with a poverty index score of less than 37, and a second with a score of 37 or more (Appendix E). Descriptive statistics reveal the following values:

$\bar{x}$ =	9.500	mean of group one
$\bar{y}$ =	17.341	mean of group two
σ_X^2 =	115.744	sample variance of group one
σ_y^2 =	338.880	sample variance of group two
m =	40	nr of samples of group one
n =	41	nr of samples of group two

T-test analysis yielded z value of -2.35, which with a one-tailed test at 5% significance, falls within the rejection region (i.e., 2.35 > 1.65). Thus, here we can reject the null hypothesis and conclude that the mean for group two is greater than the mean of group one at α=0.05. So unlike 2003, in 2006 we can be more confident that poverty and conflict are positively associated with one another.

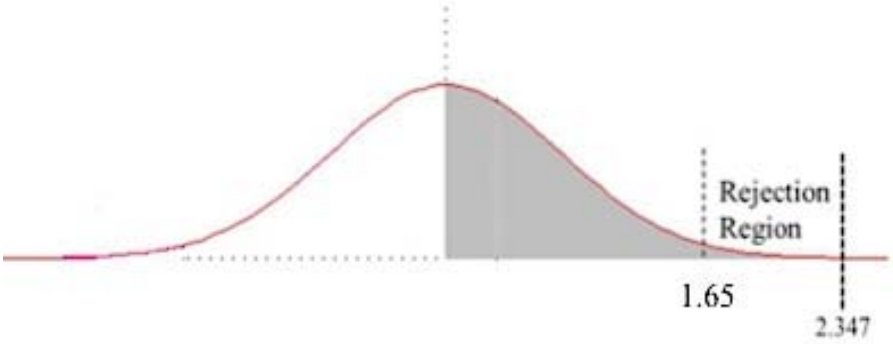


Figure 16. One-tailed Test of Poverty and Sigacts 2006

3. Governance

The Philippines is an archipelago comprised of 7,107 islands and is broadly categorized into three main geographical divisions: Luzon, Visayas and Mindanao.[101] The country is divided into 17 regions, 79 provinces, 115 cities, 1,499 municipalities, and 41,969 barangays.[102] A barangay is equivalent to a village and is the country's smallest political unit. The seat of government is located in Manila, which is within the National Capital Region.

The Philippines is governed by a constitutional democracy.[103] It has three branches of government, namely, the executive, legislative and the judiciary. The three branches are equal in principle and perform specific functions as mandated by the constitution.[104]

One of the fundamental state policies outlined in the country's constitution is the autonomy of local government units. The local government code of the Philippines purposely provides for a responsive and dynamic government structure instituted through

[101] "Philippines," Wikipedia, accessed April 04, 2012, http://en.wikipedia.org/wiki/Philippines.

[102] Patricio N. Abinales and Donna J. Amoroso, *State and Society in the Philippines,* 12.

[103] Patricio N. Abinales and Donna J. Amoroso, *State and Society in the Philippines,* 14.

[104] Patricio N. Abinales and Donna J. Amoroso, *State and Society in the Philippines,* 14.

a system of decentralization, efficiency, and accountability.[105] The local government code and other laws increased the powers of local government units (LGUs) and made governance more receptive to the needs of the people.

Despite of the decentralization of authority, many areas in the country are still deprived of basic services and economic development. Poor enforcement of the law, peace and order made some areas safe havens for terrorists, criminals and insurgents. Some LGUs deliberately fail to deliver good governance among their respective constituents. Graft and corruption, nepotism and injustice were explicitly existent in some areas. Shortfalls in the implementation of laws have occurred. Local governments can violate participation requirements with impunity from sanctions, or even social pressure, from bodies such as the Department of Interior and Local Government.[106]

To promote good governance, the NSCB developed a good-governance index (GGI). It mainly involves the LGU's exercise of economic, political and administrative authority.[107] To measure this, the GGI considered three major indices, namely, the economic-governance index (EGI), the administrative-governance index (AGI) and the political-governance Index (PGI).[108] However, other dimensions of governance were not represented due to the unavailability or incompleteness of data such as elimination of graft and corruption, improved transparency and accountability, accomplished basic infrastructure projects, among others.[109]

---

[105] "Local Government Code of the Philippines," Herald Digital Law Philippines, accessed April 04, 2012, http://philippineslaw.wordpress.com/2011/04/19/local-government-code-of-the-philippines-an-overview.

[106] Ledivina V Carino, Devolution Toward Democracy: Lessons for Theory and Practice from the Philippines," in *Decentralizing Governance : Concepts and Practices*, ed. G. Shabbir Cheema, and Dennis A. Rondinelli (Washington DC: Brookings Institution Press, 2007), 92.

[107] "National Statistics Coordination Board," *Good Governance Index*, accessed April 04, 2012 *http://www.nscb.gov.ph/ggi/techNotes.asp.*

[108] "National Statistics Coordination Board," *Good Governance Index*, accessed April 04, 2012 *http://www.nscb.gov.ph/ggi/techNotes.asp.*

[109] "National Statistics Coordination Board," *Good Governance Index*, accessed April 04, 2012 *http://www.nscb.gov.ph/ggi/techNotes.asp.*

a. Hotspot (Geospatial) Analysis

Using ArcGIS, the good-governance index scores for 2005 and 2008 were plotted geospatially. For 2005 (Figure 17) it can be seen that Sigacts density hotspots were located in light-colored areas, which are the areas with low good-governance index scores. Most of the hotspots are located in Mindanao, but conflict can also be observed in darker-shaded areas, which are areas that score high in terms of good-governance index. A similar pattern occurred in 2008. Hotspot analysis (Figure 18) shows that conflict hotspots occurred in areas with low good-governance index scores, with most of the conflict occurring in Mindanao. This initial analysis indicates that good governance is positively associated with lower levels of conflict. We now turn to a statistical analysis of this bivariate relationship to see if the relationship holds.

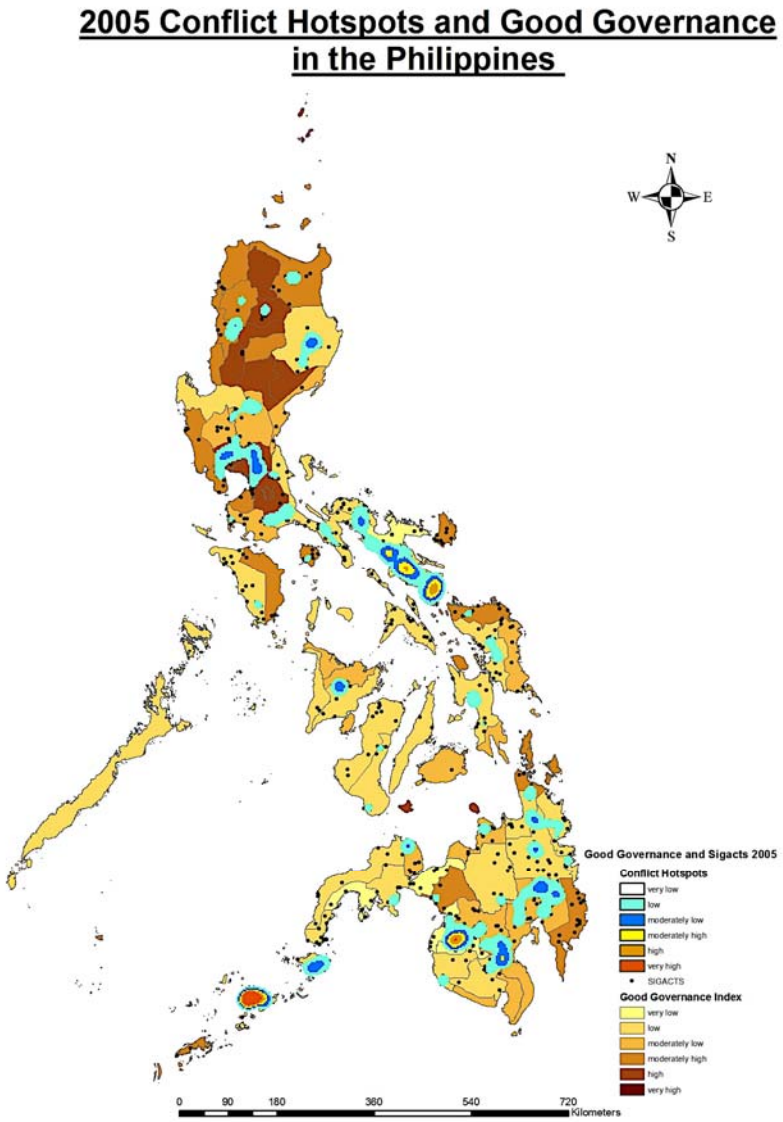


Figure 17. Conflict hotspots and good governance 2005

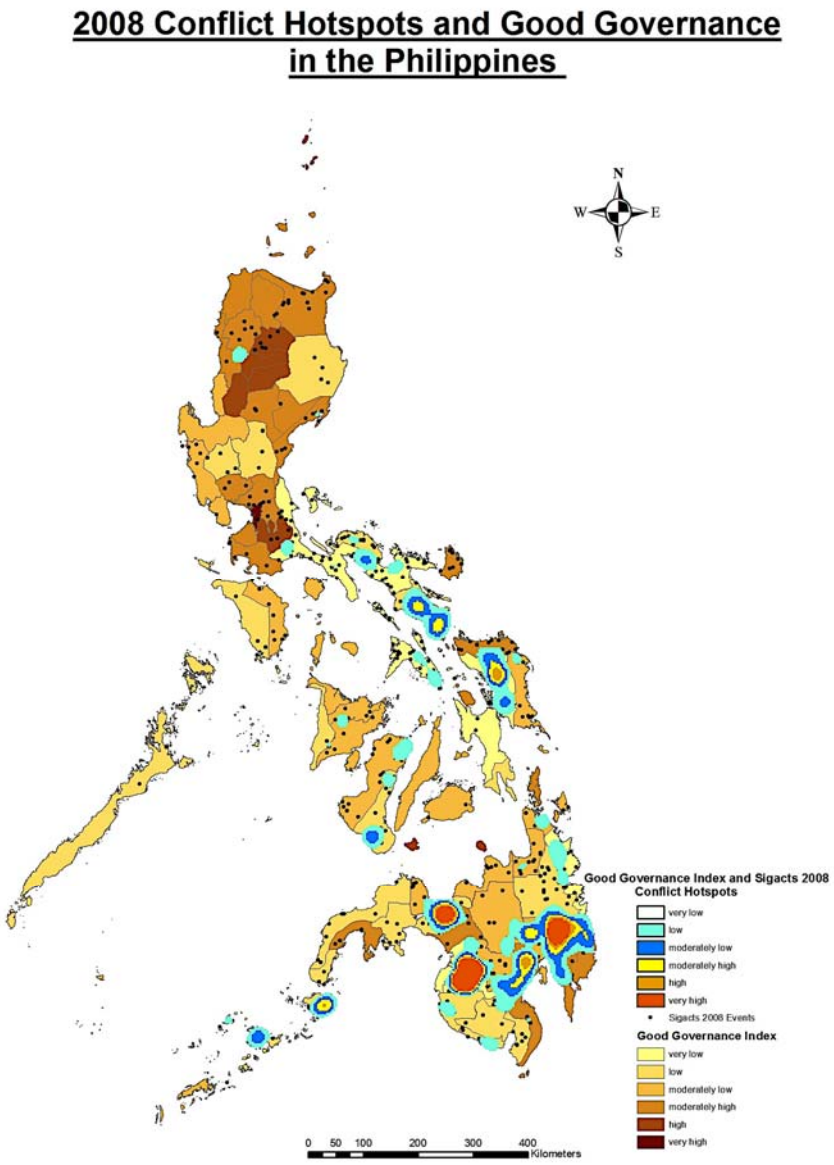


Figure 18. Conflict hotspots and good governance for 2008

b. Statistical Analysis

To further analyze the relationship between conflict and governance, data on GGI and Sigacts were projected on a scatter plot (Figure 19). Metropolitan Manila was excluded from this analysis, because of its exceedingly high GGI score (491.2), which is not surprising considering that Manila is the seat of the Philippine government. As noted earlier in 2005 993 violent incidents were recorded. The scatter plot in Figure

19 shows that Sigacts are negatively associated with GGI. The correlation of 0.434 reflects a fairly strong linear relationship between the two factors, captured by the fact that good governance alone accounts for 18.81% in the variance of conflict in the Philippines. Sulu is considered an outlier because of its Sigacts count of 80. Descriptive statistics shows that GGI has a mean of 115.8 and a median of 112.5, while Sigacts have a mean of 12.4 and a median of 9 (Appendix G).

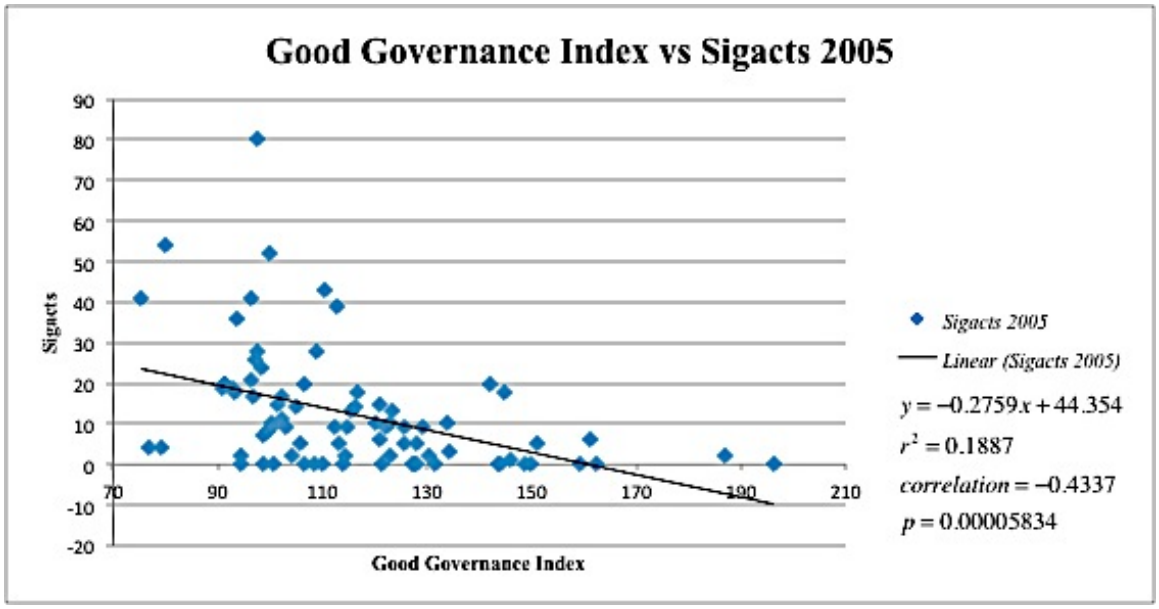


Figure 19. Scatter plot of GGI and Sigacts 2005

The GGI for 2005 was used to partition the observations into two groups: one with an index of less than 112 and a second with an index greater than or equal to 112. Descriptive statistics of the two groups are as follows:

$\bar{x}$ =	6.561	mean of group one
$\bar{y}$ =	18.564	mean of group two
σ_X^2 =	61.652	sample variance of group one
σ_y^2 =	319.831	sample variance of group two
m =	41	nr of samples of group one
n =	39	nr of samples of group two

T-test analysis yields a value of z = -3.85. Since -3.85 < -1.65 and falls within the rejection region, the null hypothesis is rejected and we can conclude that the mean for group two is greater than the mean of group one at α=0.05, providing further evidence that lower levels of conflict are associated with higher levels of good governance.

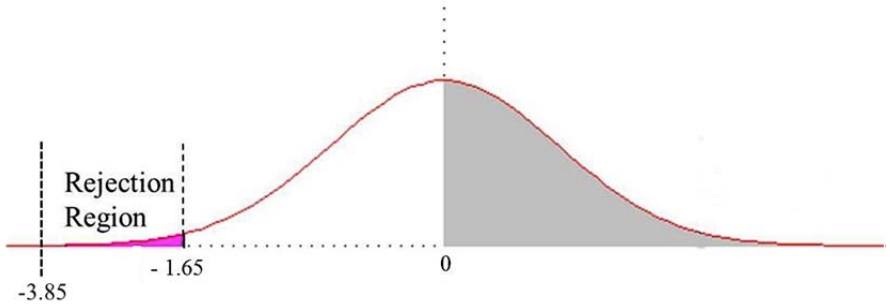


Figure 20. One-tailed Test of GGI and Sigacts 2005

In 2008 the number of Sigacts equaled 1,334 (Figure 21). The correlation coefficient is -0.281, which reflects a strong linear relationship such that good governance accounts for 7.92% in the variance of conflict in 2008. This association between good governance and lower levels of conflict is not as strong as it was in 2005, but the correlation level suggests that a robust relationship does exist between the two.

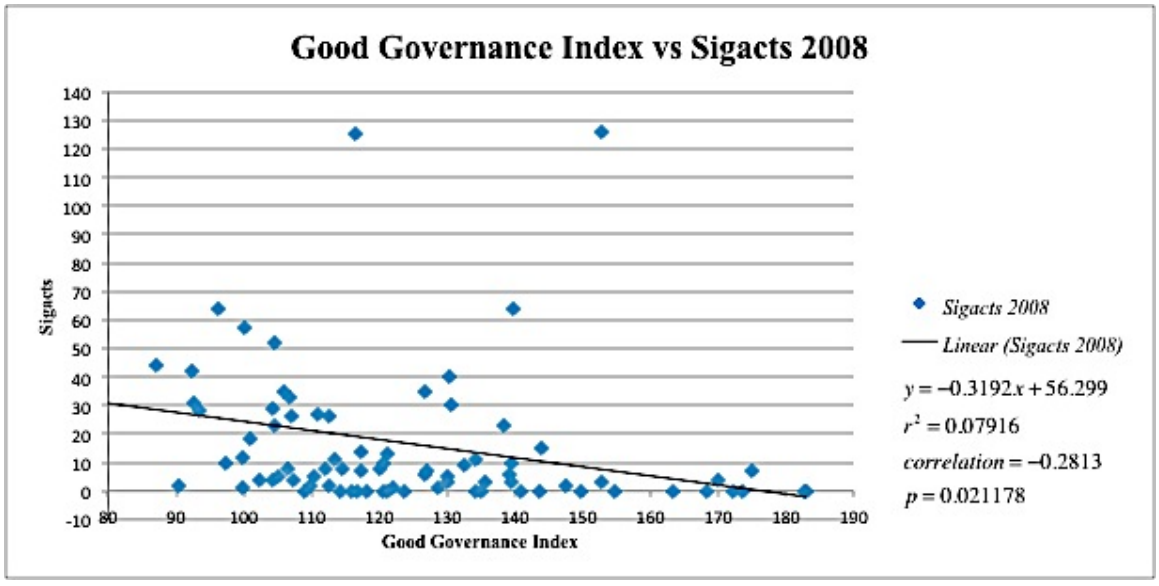


Figure 21. Scatter plot of GGI and Sigacts 2008

As before the 2008 GGI scores were used to divide the observations into two groups, one with a GGI score of less than 120, and a second with a GGI score of 120 or above (Appendix H). Descriptive statistics are as follows:

$\bar{x}$ =	10.854	mean of group one
$\bar{y}$ =	22.795	mean of group two
σ_x^2 =	512.728	sample variance of group one
σ_y^2 =	861.588	sample variance of group two
m =	41	nr of samples of group one
n =	39	nr of samples of group two

Statistical analysis indicates that the value of *z* is -2.03. Since -2.03 < -1.65 and therefore falls within the rejection region, we can reject the null hypothesis and conclude that the mean for sample two is greater than sample one at α=0.05, again providing evidence that good governance is positively associated with lower levels of violence.

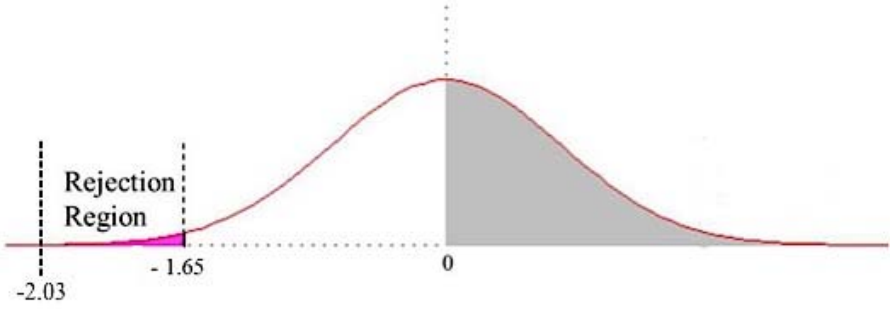


Figure 22. One-tailed Test of GGI and Sigacts 2008

4. Literacy

Basic literacy is the ability to read, write, and understand all forms of communication be it body language, signs, videos, sound or printed materials. Meanwhile, functional literacy is the ability to communicate effectively, to solve

problems scientifically and to think critically and creatively.[110] Functional literacy is the required ability to function efficiently in a society in order to improve the quality of their life.

The Philippines has one of the highest literacy rates in the developing world.[111] The Functional Literacy, Education and Mass Media Survey (FLEMMS) estimated that in 2008, out of an estimated 67 million Filipinos 10 to 64 years old, 58 million are functionally literate.[112] FLEMMS considered all those who could read, write, compute simple mathematical terms, and be able to communicate and understand the use of audio or video materials to be functionally literate. All high-school graduates or higher are automatically considered to fit the category.

The functional literacy rate varies from a region to another. Among the regions, the National Capital Region has the highest rate at 94.0%, followed by CALABARZON with 93.5% and Central Luzon with 92.1%. ARMM has the lowest functional literacy rate at 71.6%.

[110] "What is Literacy," DepEd Literacy Coordinating Council, accessed April 06, 2012, http://lcc.deped.gov.ph/lcc/index.php?

[111] "Philippines," US Department of State, accessed April 7, 2012 http://www.state.gov/r/pa/ei/bgn/2794.htm

[112] "Almost Nine Out of Ten Filipinos are Functionally Literate," DepEd Literacy Coordinating Council, accessed April 06, 2012, http://lcc.deped.gov.ph/lcc/index.php?

Region/Sex	Population 10-64 Years Old	Highest Educational Attainment				
		No Grade Completed	Elementary Level	Elementary Graduate	High School Level	High School Graduate or Higher
Philippines	**86.4**	**5.3**	**67.0**	**80.8**	**89.8**	**100.0**
Region						
National Capital Region	94.0	11.8	80.4	81.3	89.8	100.0
Cordillera Administrative Region	89.2	0.0	70.1	86.9	93.9	100.0
I – Ilocos Region	91.3	16.1	73.6	82.0	90.9	100.0
II – Cagayan Valley	86.1	2.5	66.2	82.2	91.2	100.0
III – Central Luzon	92.1	0.0	77.8	84.4	92.1	100.0
IVA - CALABARZON	93.5	3.6	81.0	87.7	94.8	100.0
IVB - MIMAROPA	83.9	6.4	65.8	80.5	91.4	100.0
V – Bicol Region	79.9	9.1	55.7	71.5	85.7	100.0
VI – Western Visayas	82.6	9.6	60.4	77.9	84.6	100.0
VII – Central Visayas	86.6	2.3	70.6	84.7	91.0	100.0
VIII – Eastern Visayas	72.9	5.3	48.3	68.6	81.0	100.0
IX – Zamboanga Peninsula	79.6	5.8	59.3	78.4	89.7	100.0
X – Northern Mindanao	85.9	3.8	63.2	84.6	92.9	100.0
XI – Davao Region	81.7	1.8	65.1	76.6	86.3	100.0
XII - SOCCSKSARGEN	78.3	1.2	57.5	74.3	86.9	100.0
XIII - Caraga	85.7	1.9	63.0	82.0	93.8	100.0
Autonomous Region in Muslim Mindanao	71.6	7.4	66.4	86.2	91.7	100.0
Sex						
Male	84.2	5.3	63.9	79.8	88.6	100.0
Female	88.7	5.2	71.1	81.9	91.1	100.0

Note: Persons who graduated from high school or completed higher level of education are, in this tabulation, considered functionally literate.

Table 1. Functional Literacy Rate of Population 10-64 Years Old by Highest Educational Attainment, Region and Sex: Philippines 2008 (From National Statistics Office[113])

The 1987 Philippine constitution has mandated that the Philippine government allocate the highest proportion of its budget allocation to education.[114] Thus the government has been making an effort to improve the literacy rate of the country. From the mid-1960s to the early 1990s, many schools have been built and enrollment rose to 120 %.[115] To ensure the improvement of literacy among Filipinos, the Literacy

[113] National Statistics Office, 2008 Functional Literacy, Education and Mass Media Survey (FLEMMS)

[114] "Philippine Constitution: Article XIV," The 1987 Constitution of the Philippines, accessed April 07, 2012, http://philippineconstitution1987.wordpress.com/2009/01/11/philippine-constitution-article-xiv/

[115] "Key Issues in Philippine Education," The Internet 1996 World Exposition, http://www.ph.net/htdocs/education/issue.htm

Coordinating Council was established by the congress to ensure that there is a body that will provide direction in the interagency planning and implementation of the education program, specifically as to the eradication of illiteracy.[116]

Even though the budget allocation for education in the Philippines has the highest appropriation, it is still below the standard of the United Nation's recommended national investment in education.[117] State spending on education has generally declined as compared to the Gross Domestic Product.

It is a common notion that uneducated people are easily exploited and could be easily swayed by insurgents, terrorists and other armed groups. It is probable that education increases the acceptance of violence, because it increases the people's political knowledge and reduces satisfaction with the status quo, causing educated people to lose faith in achieving change through democratic means.[118]

a. Hotspot (Geospatial) Analysis

Using ArcGIS the functional literacy index scores for 2003 and 2008 were geospatially plotted. For 2003, it can be seen that conflict hotspots were located in areas with low functional-literacy index scores. These conflict areas are primarily in Mindanao (Figure 23). In 2008 it can be seen that hotspots were once again prevalent in areas with low functional-literacy index scores (Figure 24). To be sure, conflict did occur in high functional literacy areas, but these preliminary results suggest that higher rates of literacy are associated with lower levels of conflict. We now turn to a bivariate statistical analysis of these two variables.

---

116 "Brief History," DepEd Literacy Coordinating Council, accessed April 06, 2012, http://lcc.deped.gov.ph/lcc/index.php?option=com_content&view=article&id=47&Itemid=57

117 Tara Quismundo, "Philippine Education Soending Still Below UN Standard," *Philippine Daily Inquirer,* March 31, 2012, accessed April 07, 2012, http://globalnation.inquirer.net/31229/philippine-education-spending-still-below-un-standard.

118 Willa Friedman, et al, "Education as Liberation," *NBER Working Paper Series 16939* (April 2011): 26, accessed January 13, 2012, http://www.nber.org/papers/w16939.

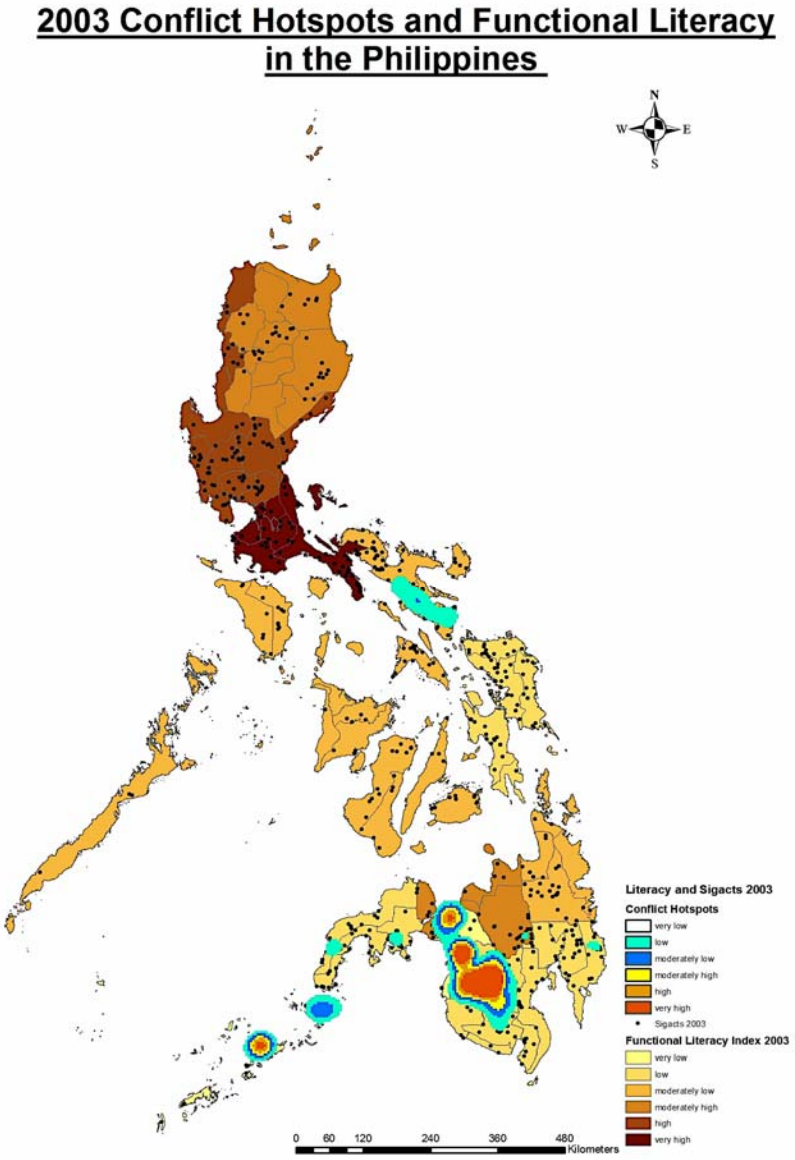


Figure 23. Conflict hotspots and functional literacy for 2003

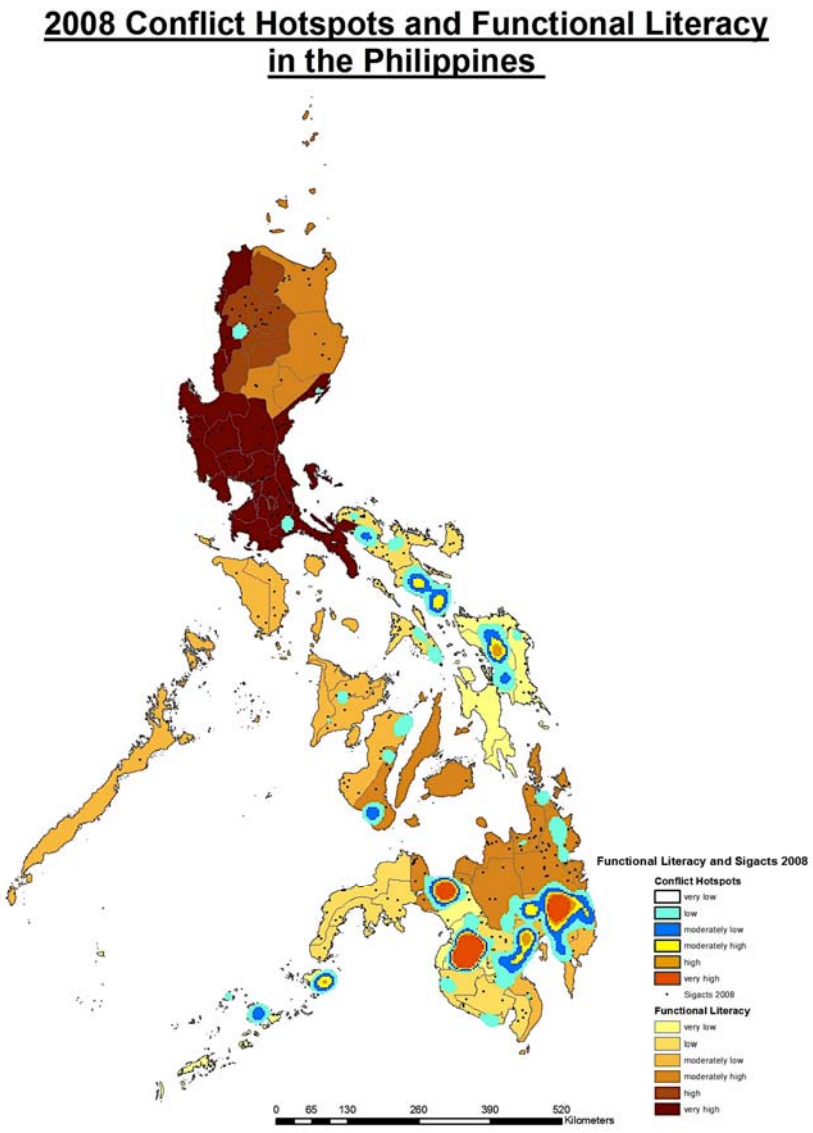


Figure 24. Conflict hotspots and functional literacy for 2008

b. Statistical Analysis

To statistically analyze conflict and literacy in the Philippines, 2003 and 2008 literacy and Sigacts data were projected on a scatter plot. As Figure 25 indicates, in 2003 a strong negative correlation (0.437) existed between literacy and conflict, which means that the literacy rate accounts for 18.62% of the variation in conflict levels across Philippine provinces. Notable outliers were North Cotabato and Maguindanao with

Sigacts score of 217 and 225, respectively, which are substantially higher than the mean (16.73) and median (8.00). However, it is also worth noting that Maguindanao and North Cotabato have a functional-literacy index score of 62.9 and 77.1, both of which are below the mean of 81.4.

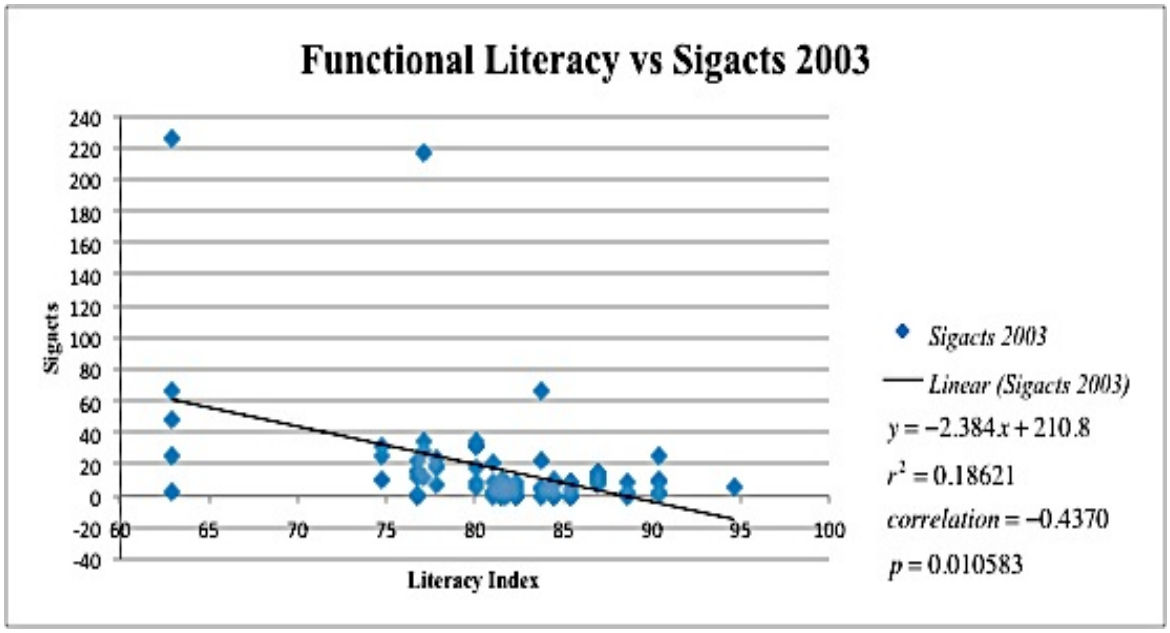


Figure 25. Scatter plot of Literacy and Sigacts 2003

The observations were divided into two groups based on the functional-literacy index score: one group with scores of less than 82, and a second with scores of 82 or higher. Descriptive statistics for the two groups are as follows:

$\bar{x}$ =	7.816	mean of group one
$\bar{y}$ =	24.605	mean of group two
σ_X^2 =	130.046	sample variance of group one
σ_y^2 =	2,134.721	sample variance of group two
m =	38	nr of samples of group one
n =	43	nr of samples of group two

T-test analysis yields a value of z = -2.31, which for a one-tailed test at a 5% significance level, falls within the rejection region (Figure 26). Thus, we can reject the null hypothesis

and conclude that the mean for group two is greater than the mean of group one at α=0.05, indicating that in 2003 functional literacy is negatively associated with conflict.

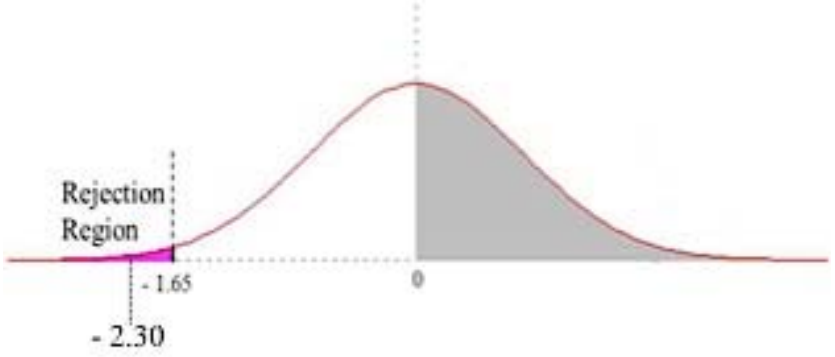


Figure 26. One-tailed Test of Literacy and Sigacts 2003

In 2008 the correlation between literacy and Sigacts was -0.376, which indicates that a strong negative linear relationship exists between these two variables and that literacy accounts for 14.1% of the variation in conflict levels.

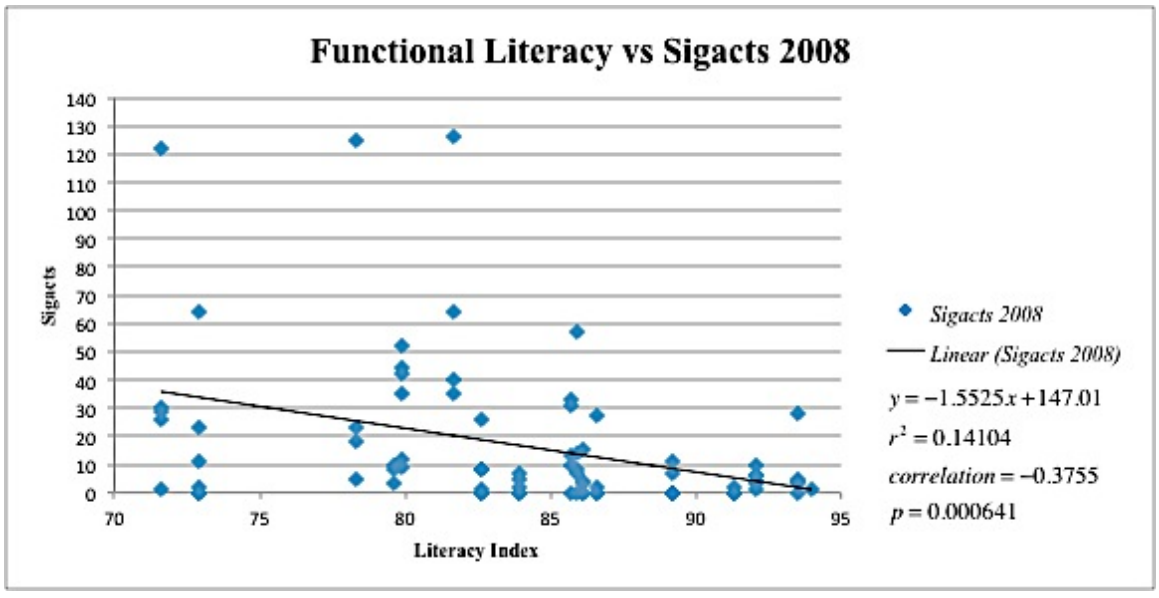


Figure 27. Scatter plot of Ethnic Diversity and Sigacts 2008

The 2008 functional literacy data were used to partition the observations into two groups: one with functional literacy scores of less than 85 and a second with scores equal to or more than 85 (Appendix K). Descriptive statistics for the two groups are as follows:

$\bar{x}$ =	7.595	mean of group one
$\bar{y}$ =	26.051	mean of group two
σ_X^2 =	138.0517	sample variance of group one
σ_y^2 =	1,152.471	sample variance of group two
m =	42	nr of samples of group one
n =	39	nr of samples of group two

Test statistics shows that the value of z = -3.22. For a one-tailed test at 5% significance level the value of z falls within the rejection region (i.e., -3.22 < -1.65). Thus, we can reject the null hypothesis and conclude that the mean for group two is greater than the mean of group one at α=0.05, indicating that functional literacy and conflict are negatively associated.

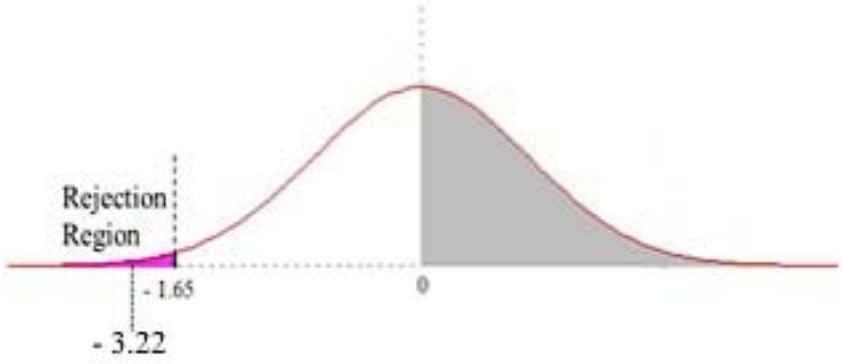


Figure 28. One-tailed Test of Literacy and Sigacts 2008

C. MULTIVARIATE ANALYSIS

A series of multivariate statistical models, one for each year that Sigacts data are available (i.e., 2003, 2005, 2006, and 2008), were estimated in order to help disentangle genuine from spurious correlations. All of the variables discussed above were included as

independent variables in the models.[119] Two additional variables were also included in the models: one that controls for the population of each province (i.e., the natural log of the population according to the 2000 census), and one that controls for the effects of Manila, the Philippine capital and seat of government, which as we saw earlier scores relatively high in terms of good governance.

The results are presented in Table 2. We can see that ethnic diversity is generally associated with higher levels of conflict. In every year except 2005 it has a positive effect, and in 2003 and 2008 that effect is statistically significant. Contrary to a lot of conventional wisdom, poverty does not appear to be a consistent cause of conflict. While in all four models, it is positively associated with conflict, only in 2008 is it a statistically significant factor. Note that this result differs somewhat from our earlier analysis, which found a statistically significant effect in 2006 in terms of correlation and t-test analyses. The results indicate that good governance is associated with lower levels of Sigacts in all years but is only statistically significant in 2003 and 2005 (Appendix M and N). Note that this result differs from the earlier bivariate analysis, which found that good governance was significant in both 2005 and 2008. Literacy is also negatively associated with Sigacts in all years and is statistically significant in 2003, 2005, and 2008, suggesting that, for the most part, increased literacy leads to lower levels of conflict.

[119] In order to estimate a model for 2003, we used the earliest good governance index available (2005), recognizing that data from 2005 generally should be used to predict 2003 conflict levels.

		Significant Acts			
		2003	2005	2006	2008
Ethnic Diversity	2003	**1.270***	-0.062		
	2005			0.593	**1.831*****
Poverty	2003	0.006	0.008		
	2006			0.021	**0.040***
Good Governance	2005	**-0.016****	**-0.017***	-0.012	
	2008				-0.001
Literacy	2003	**-0.069****	**-0.046***	-0.025	
	2008				**-0.083****
Log of Population (2000)		**0.826****	0.799	**0.836*****	**1.065*****
Manila (= 1)		**4.253***	4.915	2.233	-2.955
Intercept		-1.941	-2.901	-6.296	-6.826

Note: Standard errors (and p-values) estimated using bootstrapping
* p < .05, ** p < .01, *** p < .001

Table 2. Estimated Coefficients of Negative Binomial Regression Models

The data were further analyzed by estimating a series of geospatially-weighted regression models for each year that Sigacts data. Each model included the same variables as those included in the negative binomial models discussed above. Unfortunately, geospatial negative binomial models are not yet available, so we were forced to use geospatial models based upon ordinary least squares (OLS) approaches. In each case, three variations on the model were estimated: a standard OLS, a spatial-error OLS, and a spatial-lag OLS, and the results from the model with the best fit are presented in Table 3. Looking at Table 3, we can see that after controlling for geospatial effects, neither ethnic diversity nor poverty appear to have a statistically significant effect on conflict. Moreover, the coefficients of both variables do not consistently point in the same direction. By contrast, good governance and literacy do appear to matter. Both are

associated with lower levels of conflict and are statistically significant in most years. Of course, because OLS-based models are used to estimate the coefficients, these results should be treated with caution. Still, they suggest that resources directed at increasing levels of good governance and literacy can help reduce conflict in the Philippines and may be the best use of available resources.

		Significant Acts			
		2003	2005	2006	2008
Ethnic Diversity	2003	16.534	-4.022		
	2005			-0.834	13.320
Poverty	2003	0.090	-0.075		
	2006			-0.017	0.088
Good Governance	2005	-0.242	**-0.213****	**-0.022****	
	2008				-0.080
Literacy	2003	**-1.749****	**-0.845****	-0.529	
	2008				**-0.941***
Log of Population		7.98e-06	3.75e-06	4.14e-06	4.49e-06
Manila (= 1)		21.77	48.375	38.793	-17.090
Constant		168.585	105.414	78.292**	86.591*
Spatial Error		0.293*	0.400***	0.263*	—
Spatial Lag		—	—	—	0.409***
R-squared		0.312	0.387	0.293	0.321

* p < .05, ** p < .01, *** p < .001

Table 3. Estimated Coefficients of Geospatial Regression Models

D. CONCLUSION

Based on the above analysis, literacy and good governance are the factors considered in this thesis that consistently exhibit an effect on conflict. Indeed higher rates of both literacy and good governance appear to be associated with lower levels of conflict. This is not to say that ethnic diversity and poverty have absolutely no impact on levels of conflict. We saw in the hotspot and bivariate analysis that in 2003, but not in 2005, that higher rates of ethnic diversity are associated with higher rates of conflict. These findings held true in the multivariate analysis of the data where negative binomial models were used to estimate the coefficients. Those models indicated that ethnic diversity was positively associated with Sigacts in 2003 and was statistically significant. Those models also suggested that ethnic diversity may have been a factor in 2008 although in estimating that model, 2008 Sigacts data were regressed on 2005 ethnic diversity data, so we have to interpret this finding cautiously. However, if the ethnic makeup of the Philippines did not change substantially from 2005 to 2008, then this association could be genuine. While the analysis of the data using geospatial regression also found this positive association between ethnic diversity and conflict in 2003 and 2008, the estimated coefficients were not statistically significant. However, because we were unable to estimate geospatially-weighted count models, we probably should not dismiss the possibility that ethnic diversity is positively associated with conflict. Further analysis in this area is needed, in other words.

Poverty may also be positively associated with conflict although the evidence for this is not as strong as the evidence for ethnic diversity. The hotspot and bivariate analysis did indicate that there was a moderately positive and statistically significant correlation between poverty and conflict in 2003 and 2006, although t-test analyses of for the same periods suggested that a positive association only occurred in 2006. Both the negative binomial and geospatially-weighted regression models ruled out any association between poverty and conflict in both 2003 and 2006. However, the results from the 2008 negative binomial model suggest that there may have been a positive association between poverty and conflict in that year. This was not confirmed with the 2008 geospatial

regression model but again because we were unable to estimate a geospatially-weighted count model, we probably should not dismiss the possibility that poverty was positively associated with conflict in 2008.

What we can say with relative confidence, however, is that good governance and literacy are negatively associated with conflict. We saw this in the hot spot analysis, the bivariate analysis, and in both the negative binomial and geospatial regression models (although not in every year). Good governance, at least in theory, allows for better representation and a more efficient addressing of grievances, thus helping to lower conflict rooted in such grievances. In terms of education, increased knowledge enhances awareness and may provide reasoning skills that make individuals decide on things that they prefer to do. Put simply, these results suggest that it is these areas where available resources should be targeted.

THIS PAGE INTENTIONALLY LEFT BLANK

V. DISCUSSION

> *We are steering our government in a clear direction. A country where opportunity is available; where those in need are helped; where everyone's sacrifices are rewarded; and where those who do wrong are held accountable.*
>
> – Benigno S. Aquino III[120]

Analyzing the determinants of conflict provides a better comprehension and knowledge about the relationship between conflict and violence. Questions have been asked as to why insurgency has prevailed for a long time and why people are supporting the insurgents. Most of the counterinsurgency campaigns and internal-security plans of the Philippines call for good governance, eradication of poverty, enhancement of literacy, and recognition of ethnic diversity, among others. Various programs are being implemented all over the country with the intent to address the roots of insurgency. Still, insurgency persists.

It is quite complex and difficult to determine the generic root cause of conflict. In every place or country, the cause of conflict and violence varies. As mentioned in the literature review, several factors have been considered, and it has been asserted that different countries have different roots of conflict. Other countries cite poor economic conditions as the most important long term-cause of intrastate armed conflict;[121] in countries such as the former Yugoslavia, ethnic identity was the primary issue for genocidal violence;[122] in Vietnam and Afghanistan, the failure to upheld governance led

---

120 "President Aquino's State of the Nation Address," *GMA News Online* (Manila, Philipppines, July 25, 2011), http://ph.news.yahoo.com/president-aquinos-state-nation-address-english-092907013.html. *GMA News Online*, 25 July 2011, accessed May 2, 2012, http://ph.news.yahoo.com/president-aquinos-state-nation-address-english-092907013.html.

121 Dan Smith, "Trends and Causes of Armed Conflict", 2.

122 Dan Smith, "Trends and Causes of Armed Conflict",10.

to the defeat of the Americans and the Soviets;[123] and in Kenya, which has a long record of conflict, especially during elections, education was related with an upsurge in the acceptance of violence.[124]

For ethnic diversity, based on the statistical tests and analysis in the previous chapter, it has not been proven that areas with high levels of ethnic diversity are likely to support insurgent groups and show high levels of armed conflict. In the Philippines, ethnic diversity shows a weak relationship with conflict. The statistical analyses showed inconsistencies, having projected both positive and negative coefficients for ethnic diversity in different years. Ethnic diversity for 2005 even shows a high probability that it happened by chance. Thus, it cannot be asserted that the more heterogeneous the society, the more likely it is vulnerable to conflict and violence. The results of the tests are consistent with Fearon and Laitin's claim that it does not appear to be true that a greater degree of ethnic diversity, in itself, makes a country more prone to civil war.[125] It could also then be claimed, together with normative theorists and empirical researchers, that heterogeneity may broaden the range of collective problem solving, thus contributing to effective democracy.[126]

It is said that poverty is likely to be one of the key reasons to act as a trigger to conflict and violence.[127] But based on the results in this thesis, poverty shows a weak relationship with conflict. The variable showed inconsistencies when projected with Sigacts in different periods. While poverty may increase social discontent, it did not lead to violent conflict in this study. In past government administrations, such as the Ramos administration, poverty is identified as one of the root causes of conflict. The economic, political, and social reforms made to eliminate poverty significantly reduced the number

---

[123] Douglas A. Borer, Superpowers Defeated: Vietnam and Afghanistan Compared, xviii-xix.

[124] Willa Friedman, et al., *Education as Liberation?*, 25-26.

[125] James D. Fearon and David D. Laitin, "Ethnicity, Insurgency and Civil War," 75.

[126] Christopher J. Anderson and Aida Paskeviciute, "How Ethnic and Linguistic Heterogeneity Influence the Prospects for Civil Society: A Comparative Study of Citizenship Behavior," 799.

[127] Patricia Justino, "On the Links Between Violent Conflict and Chronic Poverty: How Much Do We Really Know," 11.

of insurgents.[128] But insurgency still persisted. While conflict in the Philippines occurs in areas with a high poverty index, violence also occurs in areas with a low poverty index. These results lessened the statistical significance of poverty over Sigacts. Poverty may be a factor, but it is not the primary reason for conflict.

Governance in the Philippines is complicated, because the country is an archipelago composed of 7,107 islands. Nevertheless, the government has managed to establish legitimacy in most areas in the Philippines. Based on the results on this thesis, governance is statistically significant in most of the tests conducted. Good governance was consistent in showing a negative correlation with conflict in all of the years tested. This shows that areas with a perception of weak governance are likely to support insurgent groups and show high levels of armed conflict. To effectively govern, the state needs the acceptance and willingness of the people governed. The people's acceptance of the ruling authorities would lead to a more stable and secure environment. Traditional conflict areas in the Philippines are those areas where government presence is hardly felt. These are far-flung and hardly accessible areas. But in regions such as the ARMM, the corrupt bureaucracy and inept local government officials made the region appear to be politically and economically deprived. As a consequence, the minimal GGI score for these regions projected a significant positive correlation with conflict.

Literacy has been identified in the statistical tests as the most significant variable among the four independent variables. This upholds the hypothesis that areas with low levels of literacy are likely to show high levels of armed conflict. It may be visually observed from the functional-literacy map in the previous chapter that functional literacy is highly dominant in the northern region of the Philippines, whereas conflict is dominant in the southern region (Figure 23 and 24). The overall pattern makes functional literacy statistically significant in relation to conflict. For the past decade, the literacy rate in the Philippines has improved. Prioritizing investment in education may signal the

[128] Carolina Hernandez, "The AFP's Institutional Responses to Armed Conflict: A Continuing Quest for the Right Approach," 5.

government's commitment to peace by keeping the people contented.[129] Thus, increases in equal opportunities in the access of education would be expected to decrease social tensions.[130]

Based on the results, literacy and governance perform as expected and are consistent with their respective assessed periods. This leads to the claim that good governance and literacy are the major determinants of conflict in the Philippines. The linear trend and the Z-tests both show that conflict decreases as good governance increases, and conflict decreases as functional literacy increases. Meanwhile, for poverty and ethnicity, the quantitative analysis fails to show a concrete relationship between Sigacts and the variables. It could be said that Sigacts generally remain the same even when the variable index increases or decreases. The variables may not directly affect conflict, but they could still be considered as contributory factors. In the Philippines, insurgents have been using poverty and ethnic-diversity issues to reach out and influence the people.[131] For poverty, a sense of deprivation is being used to blame the system and the government, which may lead to frustration and eventually violence. For ethnic diversity, discrimination and a perception of unequal distribution of entitlements may instigate misunderstanding and disagreement among groups. To test these more complicated relationships, additional research will be required.

---

[129] Patricia Justino, "On the Links Between Violent Conflict and Chronic Poverty: How Much Do We Really Know," 11

[130] Patricia Justino, "On the Links Between Violent Conflict and Chronic Poverty: How Much Do We Really Know," 11.

[131] *Philippine Human Development Report 2005*, 25.

VI. CONCLUSION

> *The ills confronting our nation are multi-faceted and complex. These can never be addressed through raising arms and wielding force against our democratic way of life as a nation. In the same vein, we recognize that a purely military solution will never be enough to adequately address these issues. As peace and security is indivisible, efforts towards these must be shared by all.*
>
> – Benigno S Aquino III[132]

This thesis started with a question: What are the determinants of conflict in the Philippines? Much has been said about the root causes of conflict in the country but it seems to lack in-depth analysis on the causes. This study identified four variables that were believed to be the central factors in violent disputes and armed clashes in the Philippines: ethnic diversity, poverty, good governance and literacy. The current literature made conflicting claims that were not fully supported. Also, the roots of conflict seem to vary from one place to another.

Different methods were used to infer relationships between dependent and independent variables. Bivariate analyses were able to analyze the causal relationship of each independent variable with conflict. Based on the analyses, good governance and literacy are shown to have significant relationships with conflict. The models show that the probability of occurrence by chance was low. Meanwhile, ethnic diversity and poverty show inconsistencies. Both variables are statistically significant in some years but insignificant in others. To sort out these findings, a multivariate analysis was conducted in order to analyze and observe the relationship of the variables in a given period of time and to separate genuine from spurious correlations. In these tests, good governance and literacy again showed consistency. Both variables were consistent in projecting a negative coefficient, and the probability that they happened by chance was very low. For ethnic diversity and poverty, the tests again revealed inconsistencies in

[132] "Internal Peace and Security Plan" (Armed Forces of the Philippines, 2011), i.

projecting coefficient relationships with Sigacts. Moreover, the tests show that in most years, the probability that they happened by chance is statistically high.

Despite these robust findings for two of the hypotheses, some limitations of the study require mention. This thesis depended mainly on the availability of data from the NSO and NSCB. Data were restricted in certain periods for census in the Philippines is not conducted annually and data are limited mostly to the regional or provincial levels. Thus, Sigacts data were drawn from periods with available data only. To address these issues, two follow-on studies are recommended. First, the same analyses should be conducted using the same methodology on the municipal level instead of the provincial level to see if the results are supported. In addition, other variables such as the human-development index (HDI) could be added or substituted to determine the relationship of conflict with facets of human development.[133] Secondly, considering that conflict varies from place to place, most of which is observed in the southern Philippines, further analysis could be run separately on each violent group—CPP/NPA, MILF, and ASG. In this manner, the variation of the determinants of conflict could be observed and compared by insurgent or terrorist group.

The full support of two out of four hypotheses points to the need for more robust methodological approaches to study conflict. Research designs and methods must move beyond bivariate analysis to include multiple regressions. As demonstrated in this case, conflict is the result of more than a single factor. It is related to the interplay of two long-term structural conditions (governance and literacy) with short-term proximate issues. Taking into account several predictive variables simultaneously yields a more accurate model of the property of interest.[134]

Keeping these limitations and caveats in mind, and based on the substantive results of this research, the government of the Philippines is advised to launch good-

[133] Human Development Index (HDI) is defined by the United Nations Development Program (UNDP) "as a process of enlarging people's choices, most critical of which are to lead a long and healthy life, to be educated and to enjoy a decent standard of living." HDI is measured by NSCB by taking the average of (1) life expectancy; (2) weighted average of functional literacy and combined elementary and secondary net enrolment rate; and (3) real per capita income.

[134] Camo, "Statistical Regression Analysis," accessed May 30, 2012, http://www.camo.com/rt/Resources/statistical-regression-analysis.html

governance and functional literacy programs to promote peace, stability, and the reduction of conflict in the Philippines.

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX A. OTHER SIGNIFICANT VARIABLES: RELATIVE DEPRIVATION AND POLITICAL CONTROL

1. Relative Deprivation

In his book *Why Men Rebel*, Ted Gurr defined relative deprivation as a perceived discrepancy between men's value expectations and their value capabilities. [135] People have a degree of expectation on the goods and conditions in life that they believe they are entitled to and think they are capable of attaining, given the social means available to them.[136] Inequities in a society, such as in the political system, security, and distribution of wealth, may cause relative deprivation. Certain groups within the society may realize that they are not appropriately accorded their social needs as expected, and thus may experience frustration. Among the conditions to have an effect are the value gains of other groups and their promise of new opportunities.[137]

Social change is more likely to occur if a struggle between different classes exists within the society. The imbalance creates instability that may eventually lead to a struggle among the social classes, thus creating disequilibrium.[138] A widening gap among social classes may develop animosity and antagonism, which could lead to hostilities and violence. According to Gurr, "Men are known to be quick to aspire beyond their social means and quick to anger when those means prove inadequate, but slow to accept their limitations."[139] A perceived incongruity in a man's expectations may lead to frustration and dissatisfaction. The intensity and scope of relative deprivation strongly determine the potential for collective violence. As such, it can be claimed that the probability of

135 Tedd Gurr, *Why Men Rebel,* (Princeton: Princeton University Press, 1965), 13.

136 Tedd Gurr, *Why Men Rebel* (1965), 13.

137 Tedd Gurr, *Why Men Rebel* (1965), 13.

138 Jonathan Wolff, "Karl Marx," *The Stanford Encyclopedia of Philosophy* (Spring 2011 Edition), accessed March 10, 2011, http://plato.stanford.edu/archives/spr2011/entries/marx/.

139 Tedd Gurr, *Why Men Rebel,* (Princeton: Princeton University Press, 1965), 58.

aggression is greater as the feeling of frustration is prolonged or increased. Aggressive behavior always presupposes the existence of frustration and the existence of frustration is expected to increase aggression.[140]

Structural inequities in the Philippine political system, including control by an elite minority, traditional politicians, and political dynasties, have created a disparity among classes. Moreover, issues on exploitation and marginalization of indigenous cultural communities, including lack of respect and recognition of ancestral domain and the indigenous legal and political system, have fuelled sectors of the society to defy and resist the government through armed struggle. [141]

In the Philippines, conflict is perceived to have been caused by poor governance, as seen in the poor delivery of basic social services, corruption and inefficiency in government bureaucracy, and poor implementation of laws.[142] The nation has been plagued with insurgency, secessionism, and terrorism. Moreover, military adventurism led to the conduct of numerous coups d'etat against past government administrations. Ferdinand Marcos was deposed through a coup led by his defense minister, Juan Ponce Enrile, and backed by the people; the Corazon Aquino administration survived seven violent military coup attempts; Joseph Estrada's administration was toppled with a military-backed people's revolt; and Gloria Arroyo's administration was challenged when troops occupied buildings and facilities in the Makati central business district, which was known as the "Oakwood" incident, and a planned declaration of withdrawal of support by key military and police special forces and marine-unit commanders.

The Moro rebellion in the early 70s flared mainly due to aggravated land disputes. Muslims claimed that they were subject to increasing discrimination and marginalization by Christian settlers and the Christian-dominated government. Pockets of violence erupted and were perceived to be motivated by religious discrimination. Christian

---

140 Tedd Gurr, *Why Men Rebel,* (Princeton: Princeton University Press, 1965), 33.

141 "Peace, Human Security and Human Development in the Philippines," Philippine Human Development Report 2005, 25.

142 "Peace, Human Security and Human Development in the Philippines," Philippine Human Development Report 2005, Human Development Network, 25, accessed August 20, 2011, http://www.arab-hdr.org/publications/other/undp/hdr/2005/phillipines-e.pdf.

vigilante groups, such as the Ilaga (rats), emerged and violently attacked Muslim settlers. In 1968, 14 to as many as 28 Muslim military trainees were executed in the island of Corregidor. The incident was then known as the "Jabidah massacre."[143] The series of events became a provocation for the Muslims and built an oppositional consciousness. When violence erupted in the south, then-president Marcos declared martial law to curtail the secessionist movement. However, the declaration aggravated the situation. Soldiers were charged with brutality and abuse, which further fomented resentment among the Muslims.

2. Political Control

In any type of social environment, it is paramount that the state asserts its legitimacy to the society in order to maintain order and security. A calibrated level of authority or political control is essential to attain sociopolitical stability.[144] Such effort is imperative for the state to establish a peaceful and secure environment conducive to national development.

Professor Gordon McCormick of the Naval Postgraduate School asserts that there is a relationship between political control and social equilibrium, such that as the equilibrium shifts towards disequilibrium, natural political control weakens. This requires government implementation of artificial controls to compensate for loss of natural political control, to stave off opportunity for insurgency.[145]

---

[143] Garrido, "The Evolution of Philippine Muslim Insurgency," Asia Times online, accessed August 20, 2011, http://www.atimes.com/atimes/Southeast_Asia/EC06Ae03.html

[144] Gordon H. McCormick, et al., "Things Fall Apart: The 'Endgame' Dynamics of Internal Wars" **(**October, 2006), 6, accessed August 03, 2011, http://www.math.usma.edu/people/horton/EndGame.pdf.

[144] Gordon McCormick (2011 January). The Political Control and Societal Equilibrium Model. Monterey, CA: Lecture presented during Dr. McCormick's Seminar on Guerrilla Warfare.

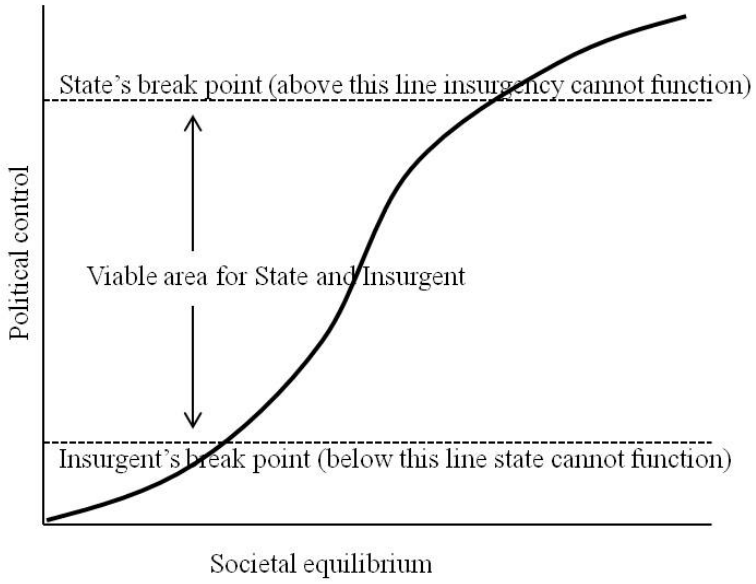


Figure 29. Political Control and Societal Equilibrium Model (From McCormick lecture on Political Control and Societal Equilibrium Model[146])

Based on Figure 2, the state requires a viable degree of political control to manage the social equilibrium. A declining political control will eventually lead to a failed state wherein insurgents can expand their influence and operations to the point where the state ceases to function. The viable area for state and insurgents is the arena where both entities clash for control of power and resources. The state's ultimate goal is to achieve the breakpoint where it has the utmost control of the society, leaving no room for maneuver for the insurgents.

146 Gordon McCormick (2011 January). The Political Control and Societal Equilibrium Model. Monterey, CA: Lecture presented during Dr. McCormick's Seminar on Guerrilla Warfare.

APPENDIX B. ETHNIC DIVERSITY AND SIGACTS 2003

Province	ethnic diversity	Sigacts 2003
Catanduanes	0.026711921	6
Siquijor	0.027846016	0
Eastern Samar	0.043850632	11
Albay	0.046793575	31
Cebu	0.048925959	4
Marinduque	0.054227817	0
Capiz	0.055892949	4
Sorsogon	0.0617949	32
Batangas	0.064059938	10
Ilocos Norte	0.06563241	1
Aklan	0.067334622	0
Batanes	0.069837163	0
Camarines Sur	0.09829773	35
Antique	0.105515715	1
Bohol	0.118683362	9
Ilocos Sur	0.135952465	8
Guimaras	0.142358829	0
La Union	0.147608547	0
Quezon	0.148820651	25
Northern Samar	0.150510581	14
Western Samar	0.160045249	22
Lanao del Sur	0.169806997	25
Laguna	0.17284475	9
Bulacan	0.181386351	10
Pampanga	0.214510646	11
Bataan	0.218462379	7
Sulu	0.265003452	67
Rizal	0.325991606	1
Southern Leyte	0.329372107	1
Oriental Mindoro	0.332656341	8
Camarines Norte	0.342131297	9
Negros Occidental	0.355668586	10
Nueva Ecija	0.357551785	14
Metropolitan Manila	0.398071373	6
Surigao del Norte	0.406122172	2
Cavite	0.409034967	2
Iloilo	0.442529876	3
Abra	0.444377011	4
Quirino	0.4551646	1

	ethnic diversity	Sigacts 2003
Isabela	0.496438545	10
Cagayan	0.507589276	7
Ifugao	0.508038339	0
Masbate	0.510252338	18
Romblon	0.519498652	0
Occidental Mindoro	0.522032717	6
Kalinga	0.524751632	8
Negros Oriental	0.551928677	7
Maguindanao	0.567567868	225
Pangasinan	0.575515618	3
Nueva Vizcaya	0.582464948	0
Misamis Oriental	0.587045623	4
Aurora	0.616481206	9
Tarlac	0.624480241	12
Apayao	0.645481078	0
Camiguin	0.651530977	0
Zamboanga del Norte	0.65434549	25
Leyte	0.657777536	16
Misamis Occidental	0.658017873	6
Biliran	0.670482807	0
Compostela Valley	0.673254069	24
Mountain Province	0.681632846	8
Zamboanga Sibugay	0.683043813	10
South Cotabato	0.684367815	28
Lanao del Norte	0.687183481	66
Davao del Sur	0.692696567	17
Benguet	0.70376469	1
Zambales	0.706190301	15
Agusan del Norte	0.712048709	8
Tawi-Tawi	0.715566662	3
Zamboanga del Sur	0.718937378	31
Sultan Kudarat	0.731881726	35
Basilan	0.747505941	48
Agusan del Sur	0.759104949	20
Sarangani	0.760368091	11
Bukidnon	0.760391441	22
Davao del Norte	0.787040104	7
Surigao del Sur	0.798692246	3
North Cotabato	0.801056381	217
Davao Oriental	0.805563967	19
Palawan	0.84578331	3

Partitioned as <0.49 and = >0.49

ethnic diversity		*Sigacts 2003*	
Mean	0.196445829	Mean	10.3333333
Standard Error	0.022346557	Standard Error	2.13648131
Median	0.150510581	Median	7
Mode	#N/A	Mode	0
Standard Deviation	0.139554203	Standard Deviation	13.3423215
Sample Variance	0.019475376	Sample Variance	178.017544
Kurtosis	-1.144641254	Kurtosis	7.75727322
Skewness	0.547001123	Skewness	2.46105615
Range	0.428452679	Range	67
Minimum	0.026711921	Minimum	0
Maximum	0.4551646	Maximum	67
Sum	7.661387326	Sum	403
Count	39	Count	39
Confidence Level(95.	0.045238239	Confidence Level(95.0	4.32508027

ethnic diversity		*Sigacts 2003*	
Mean	0.660677949	Mean	23.2195122
Standard Error	0.0149287	Standard Error	7.39928409
Median	0.673254069	Median	9
Mode	#N/A	Mode	0
Standard Deviation	0.095590323	Standard Deviation	47.3785353
Sample Variance	0.00913751	Sample Variance	2244.72561
Kurtosis	-0.868765288	Kurtosis	14.488742
Skewness	-0.156061182	Skewness	3.80964267
Range	0.349344765	Range	225
Minimum	0.496438545	Minimum	0
Maximum	0.84578331	Maximum	225
Sum	27.08779593	Sum	952
Count	41	Count	41
Confidence Level(95.	0.030172028	Confidence Level(95.0	14.9545108

Hypothesis test: u1 is the group with higher Poverty

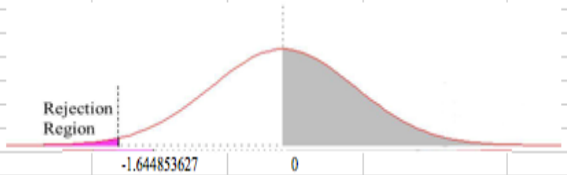
Ho: u1-u2

Ha: u2>u1

Test Statistic

$$z = \frac{xbar - ybar}{\sqrt{\left(\frac{\sigma_x^2}{m}\right) + \left(\frac{\sigma_y^2}{n}\right)}}$$

$\bar{x}$ =	10.33333333	mean of x
$\bar{y}$ =	23.2195122	mean of y
σ_x^2 =	178.0175439	sample variance of x
σ_y^2 =	2244.72561	sample variance of y
m =	39	nr of samples of x
n =	41	nr of samples of y
z =	-1.67319171	test statistic
For a one tail test z_α=	-1.644853627	at 5% significance level



Is $z<z_\alpha$ if yes, then reject Ho

if no, then accept Ho

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX C. ETHNIC DIVERSITY AND SIGACTS 2005

Province	ethnic diversity	Sigacts 2005
Catanduanes	0.026711921	9
Siquijor	0.027846016	0
Eastern Samar	0.043850632	9
Albay	0.046793575	36
Cebu	0.048925959	2
Marinduque	0.054227817	9
Capiz	0.055892949	5
Sorsogon	0.0617949	52
Batangas	0.064059938	14
Ilocos Norte	0.06563241	2
Aklan	0.067334622	0
Batanes	0.069837163	0
Camarines Sur	0.09829773	54
Antique	0.105515715	2
Bohol	0.118683362	2
Ilocos Sur	0.135952465	9
Guimaras	0.142358829	0
La Union	0.147608547	0
Quezon	0.148820651	41
Northern Samar	0.150510581	10
Western Samar	0.160045249	19
Lanao del Sur	0.169806997	6
Laguna	0.17284475	1
Bulacan	0.181386351	18
Pampanga	0.214510646	20
Bataan	0.218462379	10
Sulu	0.265003452	80
Rizal	0.325991606	6
Southern Leyte	0.329372107	0
Oriental Mindoro	0.332656341	5
Camarines Norte	0.342131297	18
Negros Occidental	0.355668586	11
Nueva Ecija	0.357551785	20
Metropolitan Manila	0.398071373	5
Surigao del Norte	0.406122172	5
Cavite	0.409034967	0
Iloilo	0.442529876	9
Abra	0.444377011	10
Quirino	0.4551646	0
	ethnic diversity	Sigacts 2005
Isabela	0.496438545	24
Cagayan	0.507589276	13
Ifugao	0.508038339	0
Masbate	0.510252338	17
Romblon	0.519498652	0
Occidental Mindoro	0.522032717	17
Kalinga	0.524751632	5
Negros Oriental	0.551928677	10
Maguindanao	0.567567868	41
Pangasinan	0.575515618	0
Nueva Vizcaya	0.582464948	0
Misamis Oriental	0.587045623	14
Aurora	0.616481206	5
Tarlac	0.624480241	9
Apayao	0.645481078	0
Camiguin	0.651530977	0
Zamboanga del Norte	0.65434549	7
Leyte	0.657777536	20
Misamis Occidental	0.658017873	13
Biliran	0.670482807	0
Compostela Valley	0.673254069	39
Mountain Province	0.681632846	0
Zamboanga Sibugay	0.683043813	4
South Cotabato	0.684367815	8
Lanao del Norte	0.687183481	4
Davao del Sur	0.692696567	28
Benguet	0.70376469	2
Zambales	0.706190301	3
Agusan del Norte	0.712048709	20
Tawi-Tawi	0.715566662	2
Zamboanga del Sur	0.718937378	19
Sultan Kudarat	0.731881726	15
Basilan	0.747505941	26
Agusan del Sur	0.759104949	28
Sarangani	0.760368091	0
Bukidnon	0.760391441	9
Davao del Norte	0.787040104	18
Surigao del Sur	0.798692246	21
North Cotabato	0.801056381	43
Davao Oriental	0.805563967	15
Palawan	0.84578331	0

Partitioned as <0.49 and = >0.49

ethnic diversity		*Sigacts 2005*	
Mean	0.196445829	Mean	12.79487
Standard Error	0.022346557	Standard Error	2.801624
Median	0.150510581	Median	9
Mode	#N/A	Mode	0
Standard Deviation	0.139554203	Standard Deviation	17.49613
Sample Variance	0.019475376	Sample Variance	306.1147
Kurtosis	-1.144641254	Kurtosis	5.589913
Skewness	0.547001123	Skewness	2.297767
Range	0.428452679	Range	80
Minimum	0.026711921	Minimum	0
Maximum	0.4551646	Maximum	80
Sum	7.661387326	Sum	499
Count	39	Count	39
Confidence Level(95.	0.045238239	Confidence Level(95.0	5.671591

ethnic diversity		*Sigacts 2005*	
Mean	0.660677949	Mean	12.17073
Standard Error	0.0149287	Standard Error	1.874053
Median	0.673254069	Median	9
Mode	#N/A	Mode	0
Standard Deviation	0.095590323	Standard Deviation	11.9998
Sample Variance	0.00913751	Sample Variance	143.9951
Kurtosis	-0.868765288	Kurtosis	0.369263
Skewness	-0.156061182	Skewness	0.976997
Range	0.349344765	Range	43
Minimum	0.496438545	Minimum	0
Maximum	0.84578331	Maximum	43
Sum	27.08779593	Sum	499
Count	41	Count	41
Confidence Level(95.	0.030172028	Confidence Level(95.0	3.787603

Hypothesis test: u1 is the group with higher Poverty

Ho: u1-u2

Ha: u2>u1

Test Statistic

$$z = \frac{xbar - ybar}{\sqrt{\left(\frac{\sigma_x^2}{m}\right) + \left(\frac{\sigma_y^2}{n}\right)}}$$

$\bar{x}$ =	12.17073171	mean of x
$\bar{y}$ =	12.79487179	mean of y
σ_x^2 =	143.995122	sample variance of x
σ_y^2 =	306.1147099	sample variance of y
m =	41	nr of samples of x
n =	39	nr of samples of y
z =	-0.185169956	test statistic
For a one tail test z_t=	-1.644853627	at 5% significance level

Is z<z_t if yes, then reject Ho

if no, then accept Ho

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX D. ETHNIC DIVERSITY OPENGEODA REGRESSION RESULTS

Ethnic Diversity 2003

```
Regression
SUMMARY OF OUTPUT: SPATIAL ERROR MODEL - MAXIMUM LIKELIHOOD ESTIMATION
Data set            : phil
Spatial Weight      : queencontiguitymatrixphil.gal
Dependent Variable  :  Sigacts200   Number of Observations:   81
Mean dependent var  :   16.506173  Number of Variables   :    2
S.D. dependent var  :   30.930078  Degrees of Freedom    :   79
Lag coeff. (Lambda) :    0.502613


R-squared           :    0.295863  R-squared (BUSE)      : -
Sq. Correlation     : -            Log likelihood        : -382.125396
Sigma-square        :     673.626  Akaike info criterion :     768.251
S.E of regression   :     25.9543  Schwarz criterion     :      773.04

------------------------------------------------------------------------
    Variable     Coefficient      Std.Error    z-value      Probability
------------------------------------------------------------------------
    CONSTANT      4.624382       7.149543      0.6468081    0.5177560
     ETH2003      21.07852       13.49881       1.561509    0.1184037
      LAMBDA     0.5026135      0.1003044       5.010882    0.0000005
------------------------------------------------------------------------
```

Ethnic Diversity 2005

```
Regression
SUMMARY OF OUTPUT: SPATIAL ERROR MODEL - MAXIMUM LIKELIHOOD ESTIMATION
Data set            : phil
Spatial Weight      : queencontiguitymatrixphil.gal
Dependent Variable  :  Sigacts2_1   Number of Observations:   81
Mean dependent var  :   12.234568  Number of Variables   :    2
S.D. dependent var  :   14.616304  Degrees of Freedom    :   79
Lag coeff. (Lambda) :    0.400181


R-squared           :    0.152455  R-squared (BUSE)      : -
Sq. Correlation     : -            Log likelihood        : -327.541051
Sigma-square        :     181.066  Akaike info criterion :     659.082
S.E of regression   :     13.4561  Schwarz criterion     :     663.871

------------------------------------------------------------------------
    Variable     Coefficient      Std.Error    z-value      Probability
------------------------------------------------------------------------
    CONSTANT      11.21712       3.549119      3.160536    0.0015749
     ETH2005     -0.4178437      6.796152     -0.0614824    0.9509749
      LAMBDA     0.4001812      0.1140112       3.510017    0.0004482
------------------------------------------------------------------------
```

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX E. POVERTY AND SIGACTS 2003

Province	PI2003	Sigacts 2003
Rizal	3.4	1
Metropolitan Manila	4.8	6
Batanes	6.3	0
Laguna	8.4	9
Bulacan	8.5	10
Cavite	8.6	2
Nueva Vizcaya	9.2	0
Bataan	10.2	7
Pampanga	10.5	11
Benguet	11	1
Zambales	13.4	15
Tarlac	14.8	12
Cagayan	16.5	7
Apayao	16.8	0
Cebu	17.1	4
Ilocos Norte	19.6	1
Capiz	21.6	4
Nueva Ecija	22.2	14
Ilocos Sur	22.8	8
Isabela	23.9	10
Quirino	24.1	1
Davao del Sur	24.2	17
Batangas	24.5	10
La Union	24.6	0
Pangasinan	25.8	3
North Cotabato	26.1	217
South Cotabato	26.4	28
Ifugao	28.1	0
Misamis Oriental	28.5	4
Aurora	29.2	9
Bohol	29.2	9
Davao del Norte	30.3	7
Siquijor	30.9	0
Iloilo	31.1	3
Negros Occidental	31.4	10
Catanduanes	31.8	6
Southern Leyte	31.9	1
Guimaras	32.7	0
Quezon	32.8	25
	PI2003	Sigacts 2003
Agusan del Norte	33.2	8
Aklan	33.5	0
Basilan	33.5	48
Sorsogon	33.7	32
Northern Samar	33.8	14
Eastern Samar	33.9	11
Albay	34.4	31
Compostela Valley	34.4	24
Zamboanga del Sur	34.4	31
Camiguin	34.5	0
Leyte	34.6	16
Tawi-Tawi	34.6	3
Bukidnon	36.9	22
Oriental Mindoro	37	8
Negros Oriental	37.1	7
Davao Oriental	37.2	19
Romblon	37.5	0
Lanao del Sur	37.6	25
Marinduque	38.3	0
Western Samar	38.7	22
Camarines Sur	40.1	35
Zamboanga Sibugay	40.7	10
Occidental Mindoro	40.9	6
Abra	41	4
Sultan Kudarat	41.5	35
Palawan	43.1	3
Antique	43.4	1
Sarangani	44.4	11
Sulu	45.1	67
Camarines Norte	46.1	9
Kalinga	46.1	8
Biliran	46.5	0
Lanao del Norte	46.5	66
Mountain Province	46.7	8
Misamis Occidental	48.1	6
Surigao del Sur	48.6	3
Agusan del Sur	52.8	20
Surigao del Norte	54.5	2
Masbate	55.9	18
Maguindanao	60.4	225
Zamboanga del Norte	64.6	25

Partitioned as <33 and = >33

PI2003		*Sigacts 2003*	
Mean	20.85128205	Mean	12.10256
Standard Error	1.459691757	Standard Error	5.495771
Median	23.9	Median	6
Mode	29.2	Mode	0
Standard Deviation	9.115772098	Standard Deviati	34.32108
Sample Variance	83.09730094	Sample Variance	1177.937
Kurtosis	-1.194100148	Kurtosis	35.90642
Skewness	-0.406436822	Skewness	5.889656
Range	29.4	Range	217
Minimum	3.4	Minimum	0
Maximum	32.8	Maximum	217
Sum	813.2	Sum	472
Count	39	Count	39
Confidence Level(95.0	2.954991473	Confidence Leve	11.12561

PI2003		*Sigacts 2003*	
Mean	41.60487805	Mean	21.53659
Standard Error	1.219075776	Standard Error	5.702599
Median	40.1	Median	11
Mode	34.4	Mode	0
Standard Deviation	7.805893646	Standard Deviati	36.51445
Sample Variance	60.93197561	Sample Variance	1333.305
Kurtosis	0.980070556	Kurtosis	24.94399
Skewness	1.142445995	Skewness	4.595932
Range	31.4	Range	225
Minimum	33.2	Minimum	0
Maximum	64.6	Maximum	225
Sum	1705.8	Sum	883
Count	41	Count	41
Confidence Level(95.0	2.463844049	Confidence Leve	11.52538

Hypothesis test: u1 is the group with higher Poverty

Ho: u1-u2

Ha: u2>u1

Test Statistic

$$z = \frac{xbar - ybar}{\sqrt{\left(\frac{\sigma_x^2}{m}\right) + \left(\frac{\sigma_y^2}{n}\right)}}$$

$\bar{x}$ =	12.1025641	mean of x
$\bar{y}$ =	21.53658537	mean of y
σ_x^2 =	1177.936572	sample variance of x
σ_y^2 =	1333.304878	sample variance of y
m =	39	nr of samples of x
n =	41	nr of samples of y
z =	-1.191195322	test statistic
For a one tail test z_a =	-1.644853627	at 5% significance level

Is z<z_a if yes, then reject Ho

if no, then accept Ho

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX F. POVERTY AND SIGACTS 2006

Province	PI2006	Sigacts 2006
Batanes	6.3	0
Rizal	6.4	8
Bataan	6.8	9
Metropolitan Manila	7.1	5
Cavite	7.8	0
Benguet	8.2	1
Pampanga	8.3	14
Bulacan	10	9
Laguna	10.6	9
Nueva Vizcaya	12.7	3
Quirino	15.9	1
Ilocos Norte	17.1	0
Cagayan	19.3	17
Tarlac	22.1	4
Siquijor	22.3	0
Zambales	22.6	7
Davao del Sur	23	38
Cebu	23.5	3
Iloilo	24.1	7
Capiz	24.3	4
Isabela	24.4	17
Batangas	25.6	7
Ilocos Sur	27.2	2
La Union	27.6	1
Pangasinan	27.6	1
North Cotabato	27.7	43
Southern Leyte	29	2
Zamboanga del Sur	29	23
Bukidnon	29.6	18
South Cotabato	30.7	13
Ifugao	30.9	0
Biliran	31.4	0
Misamis Oriental	31.5	29
Aurora	31.6	7
Basilan	31.7	7
Nueva Ecija	32	20
Negros Occidental	33.4	29
Zamboanga Sibugay	34	5
Agusan del Norte	35.2	17
Guimaras	35.2	0
	PI2006	Sigacts 2006
Catanduanes	37.3	7
Davao del Norte	37.7	23
Albay	37.8	28
Camarines Norte	38.4	8
Quezon	38.4	47
Bohol	38.8	2
Camiguin	39.3	0
Compostela Valley	39.8	43
Western Samar	40.2	55
Leyte	40.5	17
Sultan Kudarat	40.7	20
Davao Oriental	40.8	19
Marinduque	40.8	0
Palawan	40.8	2
Camarines Sur	41.2	59
Romblon	41.9	0
Aklan	42.6	1
Eastern Samar	42.7	13
Antique	43	5
Sorsogon	43.5	51
Negros Oriental	43.7	9
Lanao del Norte	44.1	2
Sarangani	44.8	9
Mountain Province	45	11
Surigao del Sur	45.4	26
Kalinga	45.8	7
Occidental Mindoro	46.5	14
Sulu	46.5	57
Oriental Mindoro	47.1	4
Agusan del Sur	48.7	31
Misamis Occidental	48.8	5
Abra	50.1	11
Masbate	51	40
Northern Samar	52.2	19
Lanao del Sur	52.5	3
Dinagat Islands	53.2	0
Surigao del Norte	53.2	8
Apayao	57.5	1
Maguindanao	62	49
Zamboanga del Norte	63	5
Tawi-Tawi	78.9	0

Partitioned as <37 and = >37

PI2006		*Sigacts 2006*	
Mean	22.5925	Mean	9.5
Standard Error	1.495704908	Standard Error	1.701055
Median	24.35	Median	7
Mode	27.6	Mode	0
Standard Deviation	9.459668436	Standard Deviati	10.75842
Sample Variance	89.48532692	Sample Variance	115.7436
Kurtosis	-1.071408807	Kurtosis	2.022673
Skewness	-0.560911588	Skewness	1.533705
Range	28.9	Range	43
Minimum	6.3	Minimum	0
Maximum	35.2	Maximum	43
Sum	903.7	Sum	380
Count	40	Count	40
Confidence Level(95.0	3.025348737	Confidence Leve	3.440709

PI2006		*Sigacts 2006*	
Mean	46.00487805	Mean	17.34146
Standard Error	1.289634809	Standard Error	2.874957
Median	43.7	Median	9
Mode	40.8	Mode	0
Standard Deviation	8.257691906	Standard Deviati	18.40871
Sample Variance	68.18947561	Sample Variance	338.8805
Kurtosis	5.389190634	Kurtosis	-0.13623
Skewness	1.996487299	Skewness	1.074051
Range	41.6	Range	59
Minimum	37.3	Minimum	0
Maximum	78.9	Maximum	59
Sum	1886.2	Sum	711
Count	41	Count	41
Confidence Level(95.0	2.606449176	Confidence Leve	5.810505

Hypothesis test: u1 is the group with higher Poverty

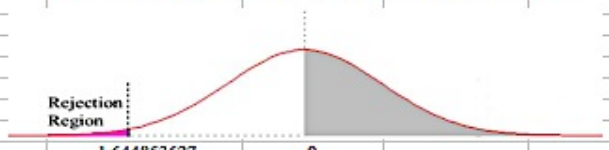
Ho: u1-u2

Ha: u2>u1

Test Statistic

$$z = \frac{xbar - ybar}{\sqrt{\left(\frac{\sigma_x^2}{m}\right) + \left(\frac{\sigma_y^2}{n}\right)}}$$

$\bar{x}$ =	9.5	mean of x
$\bar{y}$ =	17.34146341	mean of y
σ_x^2 =	115.7435897	sample variance of x
σ_y^2 =	338.8804878	sample variance of y
m =	40	nr of samples of x
n =	41	nr of samples of y
z =	-2.347389266	test statistic
For a one tail test z_α=	-1.644853627	at 5% significance level



Is $z<z_\alpha$ if yes, then reject Ho

if no, then accept Ho

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX G. POVERTY INDEX OPENGEODA REGRESSION RESULTS

Poverty Index 2003

```
Regression
SUMMARY OF OUTPUT: SPATIAL ERROR MODEL - MAXIMUM LIKELIHOOD ESTIMATION
Data set            : phil
Spatial Weight      : queencontiguitymatrixphil.gal
Dependent Variable  :  Sigacts200   Number of Observations:   81
Mean dependent var  :   16.506173  Number of Variables   :    2
S.D. dependent var  :   30.930078  Degrees of Freedom    :   79
Lag coeff. (Lambda) :    0.483911



R-squared           :    0.278752  R-squared (BUSE)      : -
Sq. Correlation     : -            Log likelihood        : -382.811226
Sigma-square        :     689.997  Akaike info criterion :     769.622
S.E of regression   :     26.2678  Schwarz criterion     :     774.411

------------------------------------------------------------------------
    Variable     Coefficient     Std.Error    z-value      Probability
------------------------------------------------------------------------
    CONSTANT      4.336547       9.748739     0.4448316    0.6564415
      PI2003     0.2705407      0.2579775      1.048699    0.2943168
      LAMBDA      0.483911      0.1029706      4.699507    0.0000026
------------------------------------------------------------------------
```

Poverty Index 2006

```
Spatial Lag Regression
SUMMARY OF OUTPUT: SPATIAL LAG MODEL - MAXIMUM LIKELIHOOD ESTIMATION
Data set            : phil
Spatial Weight      : queenphil.gal
Dependent Variable  :  Sigacts2_2  Number of Observations:   81
Mean dependent var  :     12.9383  Number of Variables   :    3
S.D. dependent var  :     15.1636  Degrees of Freedom    :   78
Lag coeff.   (Rho)  :    0.317866



R-squared           :    0.150817  Log likelihood        :    -329.793
Sq. Correlation     : -            Akaike info criterion :     665.585
Sigma-square        :     195.256  Schwarz criterion     :     672.769
S.E of regression   :     13.9734

------------------------------------------------------------------------
    Variable     Coefficient     Std.Error    z-value      Probability
------------------------------------------------------------------------
W_Sigacts2_2     0.3178661      0.1130794        2.811     0.0049389
    CONSTANT      3.449377       4.060813      0.84943     0.3956419
      PI2006     0.1600817      0.1041425     1.537141     0.1242588
------------------------------------------------------------------------
```

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX H. GOOD GOVERNANCE INDEX AND SIGACTS 2005

Province	GGI2005	Sigacts 2005
Maguindanao	75.3	41
Lanao del Norte	76.74	4
Zamboanga Sibugay	79.01	4
Camarines Sur	79.95	54
Zamboanga del Sur	90.86	19
Leyte	91.15	20
Agusan del Norte	91.16	20
Western Samar	92.71	19
Camarines Norte	93.12	18
Albay	93.46	36
Palawan	94.38	0
Antique	94.54	2
Surigao del Sur	96.25	21
Quezon	96.27	41
Masbate	96.85	17
Basilan	96.99	26
Agusan del Sur	97.34	28
Sulu	97.34	80
Isabela	98.17	24
Pangasinan	98.63	0
Zamboanga del Norte	98.82	7
South Cotabato	99.59	8
Sorsogon	99.89	52
Negros Oriental	100.16	10
Iloilo	100.17	9
Romblon	100.57	0
Sultan Kudarat	101.31	15
Occidental Mindoro	102.09	17
Negros Occidental	102.33	11
Bukidnon	102.88	9
Cebu	104.07	2
Batangas	105.05	14
Aurora	105.73	5
Aklan	106.51	0
Nueva Ecija	106.59	20
Sarangani	108.38	0
Davao del Sur	108.99	28
Southern Leyte	110.1	0
North Cotabato	110.37	43
Compostela Valley	112.69	39
Capiz	112.97	5
Guimaras	113.93	0
Bohol	114.15	2
Eastern Samar	114.67	9
Misamis Occidental	115.56	13
Misamis Oriental	116.27	14
Davao del Norte	116.73	18
Northern Samar	120.25	10
Davao Oriental	120.93	15
Lanao del Sur	121.05	6
Biliran	121.36	0
Marinduque	122.28	9
Bataan	122.78	10
Tawi-Tawi	122.94	2
Cagayan	123.13	13
Oriental Mindoro	125.5	5
Catanduanes	125.53	9
Ifugao	127.1	0
La Union	127.74	0
Dinagat Islands	128.09	0
Surigao del Norte	128.09	5
Ilocos Sur	129	9
Ilocos Norte	130.47	2
Cavite	131.31	0
Abra	133.82	10
Zambales	134.08	3
Pampanga	141.87	20
Quirino	143.54	0
Nueva Vizcaya	143.81	0
Bulacan	144.71	18
Laguna	145.98	1
Mountain Province	148.62	0
Camiguin	149.83	0
Kalinga	150.92	5
Apayao	159.01	0
Rizal	161.23	6
Siquijor	162.22	0
Benguet	186.79	2
Batanes	196.2	0

Partitioned as <112 and = >112

GGI2005		*Sigacts 2005*	
Mean	97.53384615	Mean	18.5641
Standard Error	1.377120184	Standard Error	2.863704
Median	98.63	Median	17
Mode	97.34	Mode	0
Standard Deviation	8.600112795	Standard Deviation	17.88383
Sample Variance	73.96194008	Sample Variance	319.8313
Kurtosis	1.026557534	Kurtosis	2.499922
Skewness	-0.995113497	Skewness	1.43875
Range	35.07	Range	80
Minimum	75.3	Minimum	0
Maximum	110.37	Maximum	80
Sum	3803.82	Sum	724
Count	39	Count	39
Confidence Level(95.0%)	2.787834064	Confidence Level(95.0%)	5.797266

GGI2005		*Sigacts 2005*	
Mean	133.1570732	Mean	6.560976
Standard Error	3.031857964	Standard Error	1.226262
Median	127.74	Median	5
Mode	128.09	Mode	0
Standard Deviation	19.41336321	Standard Deviation	7.851907
Sample Variance	376.8786712	Sample Variance	61.65244
Kurtosis	2.379923002	Kurtosis	6.033604
Skewness	1.490679572	Skewness	2.009528
Range	83.91	Range	39
Minimum	112.29	Minimum	0
Maximum	196.2	Maximum	39
Sum	5459.44	Sum	269
Count	41	Count	41
Confidence Level(95.0%)	6.127613518	Confidence Level(95.0%)	2.478368

Hypothesis test: u1 is the group with higher GGI

Ho: u1-u2

Ha: u1<u2

Test Statistic

$$z = \frac{xbar - ybar}{\sqrt{\left(\frac{\sigma_x^2}{m}\right) + \left(\frac{\sigma_y^2}{n}\right)}}$$

$\bar{x}$ =	6.56097561	mean of x
$\bar{y}$ =	18.56410256	mean of y
σ_x^2 =	61.65243902	sample variance of x
σ_y^2 =	319.831309	sample variance of y
m =	41	nr of samples of x
n =	39	nr of samples of y
z =	-3.853074014	test statistic
For a one tail test z_a =	-1.644853627	at 5% significance level

Is $z<z_a$ — if yes, then reject Ho; if no, then accept Ho

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX I. GOOD GOVERNANCE INDEX AND SIGACTS 2008

Province	GGI2008	Sigacts 2008
Maguindanao	79.06	122
Camarines Sur	87.14	44
Leyte	90.37	2
Masbate	92.44	42
Surigao del Sur	92.55	31
Quezon	93.54	28
Western Samar	96.33	64
Zamboanga del Sur	97.4	10
Antique	99.76	1
Camarines Norte	99.83	12
Lanao del Norte	100.14	57
Sultan Kudarat	101.06	18
Isabela	102.26	4
Nueva Ecija	104.18	4
Basilan	104.38	29
Sarangani	104.5	23
Sorsogon	104.67	52
South Cotabato	105.13	5
Albay	105.86	35
Zamboanga del Norte	106.43	8
Agusan del Sur	106.84	33
Sulu	107	26
Tarlac	107.23	4
Southern Leyte	108.9	0
Palawan	109.68	2
Occidental Mindoro	110.48	5
Negros Oriental	110.88	27
Capiz	112.11	8
Negros Occidental	112.49	26
Bohol	112.59	2
Eastern Samar	113.32	11
La Union	114.34	0
Iloilo	114.62	8
Pangasinan	115.93	0
North Cotabato	116.48	125
Aklan	116.73	0
Bukidnon	117.2	14
Misamis Oriental	117.31	7
Marinduque	118.11	0
	GGI2008	Sigacts 2008
Misamis Occidental	120.16	8
Surigao del Norte	120.53	10
Guimaras	120.59	0
Romblon	121.05	0
Agusan del Norte	121.2	13
Bataan	122.14	1
Cebu	123.61	0
Zambales	126.7	6
Davao del Norte	126.77	35
Oriental Mindoro	126.97	7
Tawi-Tawi	128.73	1
Batangas	129.95	5
Nueva Vizcaya	130.06	3
Davao Oriental	130.29	40
Lanao del Sur	130.67	30
Catanduanes	132.56	9
Ilocos Norte	134.22	0
Abra	134.26	11
Cavite	135.07	0
Zamboanga Sibugay	135.68	3
Northern Samar	138.43	23
Bulacan	139.32	6
Pampanga	139.38	3
Aurora	139.59	10
Davao del Sur	139.79	64
Biliran	140.91	0
Quirino	143.74	0
Cagayan	143.96	15
Ilocos Sur	147.45	2
Dinagat Islands	149.81	0
Rizal	152.64	3
Compostela Valley	152.78	126
Apayao	154.69	0
Ifugao	163.24	0
Mountain Province	168.34	0
Laguna	169.89	4
Batanes	172.2	0
Benguet	173.57	0
Kalinga	174.92	7
Siquijor	182.85	0
Camiguin	182.92	0

GGI2008		*Sigacts 2008*	
Mean	105.365897	Mean	22.79487179
Standard Error	1.48569076	Standard Error	4.700213836
Median	106.43	Median	11
Mode	#N/A	Mode	0
Standard Deviation	9.27813579	Standard Deviation	29.352826
Sample Variance	86.0838038	Sample Variance	861.5883941
Kurtosis	0.34988654	Kurtosis	5.645739586
Skewness	-0.77927439	Skewness	2.250918876
Range	39.05	Range	125
Minimum	79.06	Minimum	0
Maximum	118.11	Maximum	125
Sum	4109.27	Sum	889
Count	39	Count	39
Confidence Level(95.0%)	3.00762369	Confidence Level(95.0%)	9.515085459

GGI2008		*Sigacts 2008*	
Mean	141.990976	Mean	10.85365854
Standard Error	2.86956034	Standard Error	3.536320427
Median	138.43	Median	3
Mode	#N/A	Mode	0
Standard Deviation	18.3741514	Standard Deviation	22.64349904
Sample Variance	337.609439	Sample Variance	512.7280488
Kurtosis	-0.30068888	Kurtosis	17.22983861
Skewness	0.85683168	Skewness	3.848177694
Range	62.76	Range	126
Minimum	120.16	Minimum	0
Maximum	182.92	Maximum	126
Sum	5821.63	Sum	445
Count	41	Count	41
Confidence Level(95.0%)	5.79959779	Confidence Level(95.0%)	7.147170188

Hypothesis test: u1 is the group with higher GGI

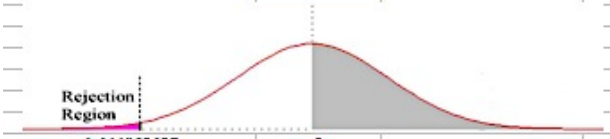
Ho: u1-u2

Ha: u1<u2

Test Statistic

$$z = \frac{xbar - ybar}{\sqrt{\left(\frac{\sigma_x^2}{m}\right) + \left(\frac{\sigma_y^2}{n}\right)}}$$

$\bar{x}$ =	10.8536585	mean of x
$\bar{y}$ =	22.7948718	mean of y
σ_x^2 =	512.728049	sample variance of x
σ_y^2 =	861.588394	sample variance of y
m =	41	nr of samples of x
n =	39	nr of samples of y
z =	-2.03013838	test statistic
For a one tail test z_a =	-1.64485363	at 5% significance level



-1.644853627 0

Is $z<z_a$ if yes, then reject Ho

if no, then accept Ho

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX J. GOOD GOVERNANCE INDEX OPENGEODA REGRESSION RESULTS

Good Governance Index 2005

```
Regression
SUMMARY OF OUTPUT: SPATIAL ERROR MODEL - MAXIMUM LIKELIHOOD ESTIMATION
Data set            : phil
Spatial Weight      : queencontiguitymatrixphil.gal
Dependent Variable  :  Sigacts2_1   Number of Observations:   81
Mean dependent var  :   12.234568  Number of Variables   :    2
S.D. dependent var  :   14.616304  Degrees of Freedom    :   79
Lag coeff. (Lambda) :    0.366437



R-squared           :    0.231136  R-squared (BUSE)      : -
Sq. Correlation     : -            Log likelihood        : -323.236444
Sigma-square        :     164.257  Akaike info criterion :     650.473
S.E of regression   :     12.8163  Schwarz criterion     :     655.262

------------------------------------------------------------------------
    Variable     Coefficient     Std.Error    z-value      Probability
------------------------------------------------------------------------
    CONSTANT      30.25241       6.598701        4.5846    0.0000046
     GGI2005    -0.1644514     0.05428842      -3.029218    0.0024520
      LAMBDA     0.3664367      0.1180426       3.104275    0.0019076
------------------------------------------------------------------------
```

Good Governance Index 2008

```
Spatial Lag Regression
SUMMARY OF OUTPUT: SPATIAL LAG MODEL - MAXIMUM LIKELIHOOD ESTIMATION
Data set            : phil
Spatial Weight      : philqueen.gal
Dependent Variable  :  Sigacts2_3   Number of Observations:   81
Mean dependent var  :     15.6914  Number of Variables   :    3
S.D. dependent var  :     25.5588  Degrees of Freedom    :   78
Lag coeff.    (Rho) :    0.471244



R-squared           :    0.262766  Log likelihood        :    -368.064
Sq. Correlation     : -            Akaike info criterion :     742.128
Sigma-square        :     481.598  Schwarz criterion     :     749.311
S.E of regression   :     21.9453

------------------------------------------------------------------------
    Variable     Coefficient     Std.Error    z-value      Probability
------------------------------------------------------------------------
W_Sigacts2_3      0.4712445      0.1004217       4.692655    0.0000027
    CONSTANT        19.6396       11.44393       1.716159    0.0861330
     GGI2008    -0.08839187     0.08982979     -0.9839929    0.3251190
------------------------------------------------------------------------
```

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX K. FUNCTIONAL LITERACY AND SIGACTS 2003

Province	LIT 2003	Sigacts 2003
Basilan	62.9	48
Lanao del Sur	62.9	25
Maguindanao	62.9	225
Sulu	62.9	67
Tawi-Tawi	62.9	3
Zamboanga del Norte	74.8	25
Zamboanga del Sur	74.8	31
Zamboanga Sibugay	74.8	10
Biliran	76.7	0
Eastern Samar	76.7	11
Leyte	76.7	16
Northern Samar	76.7	14
Southern Leyte	76.7	1
Western Samar	76.7	22
North Cotabato	77.1	217
Sarangani	77.1	11
South Cotabato	77.1	28
Sultan Kudarat	77.1	35
Compostela Valley	77.8	24
Davao del Norte	77.8	7
Davao del Sur	77.8	17
Davao Oriental	77.8	19
Albay	80.1	31
Camarines Norte	80.1	9
Camarines Sur	80.1	35
Catanduanes	80.1	6
Masbate	80.1	18
Sorsogon	80.1	32
Agusan del Norte	81	8
Agusan del Sur	81	20
Dinagat Islands	81	0
Surigao del Norte	81	2
Surigao del Sur	81	3
Aklan	81.5	0
Antique	81.5	1
Capiz	81.5	4
Guimaras	81.5	0
Iloilo	81.5	3
Negros Occidental	81.5	10
Bohol	81.7	9
Cebu	81.7	4
Negros Oriental	81.7	7
Siquijor	81.7	0
	LIT 2003	Sigacts 2003
Marinduque	82.3	0
Occidental Mindoro	82.3	6
Oriental Mindoro	82.3	8
Palawan	82.3	3
Romblon	82.3	0
Bukidnon	83.7	22
Camiguin	83.7	0
Lanao del Norte	83.7	66
Misamis Occidental	83.7	6
Misamis Oriental	83.7	4
Batanes	84.4	0
Cagayan	84.4	7
Isabela	84.4	10
Nueva Vizcaya	84.4	0
Quirino	84.4	1
Abra	85.4	4
Apayao	85.4	0
Benguet	85.4	1
Ifugao	85.4	0
Kalinga	85.4	8
Mountain Province	85.4	8
Aurora	86.9	9
Bataan	86.9	7
Bulacan	86.9	10
Nueva Ecija	86.9	14
Pampanga	86.9	11
Tarlac	86.9	12
Zambales	86.9	15
Ilocos Norte	88.6	1
Ilocos Sur	88.6	8
La Union	88.6	0
Pangasinan	88.6	3
Batangas	90.4	10
Cavite	90.4	2
Laguna	90.4	9
Quezon	90.4	25
Rizal	90.4	1
Metropolitan Manila	94.6	6

Partitioned as <82 and = >82

LIT 2003		*Sigacts 2003*	
Mean	77.21162791	Mean	24.60465
Standard Error	0.866921395	Standard Error	7.045898
Median	77.8	Median	11
Mode	76.7	Mode	0
Standard Deviation	5.684783754	Standard Deviation	46.20304
Sample Variance	32.31676633	Sample Variance	2134.721
Kurtosis	2.426939609	Kurtosis	14.80088
Skewness	-1.827827897	Skewness	3.812266
Range	18.8	Range	225
Minimum	62.9	Minimum	0
Maximum	81.7	Maximum	225
Sum	3320.1	Sum	1058
Count	43	Count	43
Confidence Level(95.0%)	1.749518205	Confidence Level(95.0%)	14.2192

LIT 2003		*Sigacts 2003*	
Mean	86.15	Mean	7.815789
Standard Error	0.471427571	Standard Error	1.849938
Median	85.4	Median	6
Mode	86.9	Mode	0
Standard Deviation	2.906074719	Standard Deviation	11.40378
Sample Variance	8.44527027	Sample Variance	130.0462
Kurtosis	0.396782361	Kurtosis	18.60924
Skewness	0.768079322	Skewness	3.847673
Range	12.3	Range	66
Minimum	82.3	Minimum	0
Maximum	94.6	Maximum	66
Sum	3273.7	Sum	297
Count	38	Count	38
Confidence Level(95.0%)	0.955202991	Confidence Level(95.0%)	3.74833

Hypothesis test: u1 is the group with higher Literacy

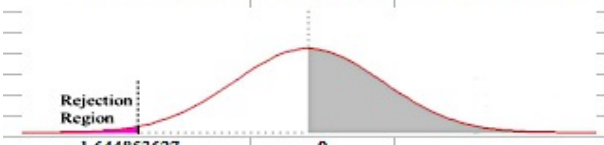
Ho: u1-u2

Ha: u1<u2

Test Statistic

$$z = \frac{xbar - ybar}{\sqrt{\left(\frac{\sigma_x^2}{m}\right) + \left(\frac{\sigma_y^2}{n}\right)}}$$

$\bar{x}$ =	7.815789474	mean of x
$\bar{y}$ =	24.60465116	mean of y
σ_x^2 =	130.0462304	sample variance of x
σ_y^2 =	2134.72093	sample variance of y
m =	38	nr of samples of x
n =	43	nr of samples of y
z =	-2.304672503	test statistic
For a one tail test z_a =	-1.644853627	at 5% significance level



Is $z<z_a$ if yes, then reject Ho

if no, then accept Ho

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX L. FUNCTIONAL LITERACY AND SIGACTS 2008

Province	LIT 2008	Sigacts 2008
Basilan	71.6	29
Lanao del Sur	71.6	30
Maguindanao	71.6	122
Sulu	71.6	26
Tawi-Tawi	71.6	1
Biliran	72.9	0
Eastern Samar	72.9	11
Leyte	72.9	2
Northern Samar	72.9	23
Southern Leyte	72.9	0
Western Samar	72.9	64
North Cotabato	78.3	125
Sarangani	78.3	23
South Cotabato	78.3	5
Sultan Kudarat	78.3	18
Zamboanga del Norte	79.6	8
Zamboanga del Sur	79.6	10
Zamboanga Sibugay	79.6	3
Albay	79.9	35
Camarines Norte	79.9	12
Camarines Sur	79.9	44
Catanduanes	79.9	9
Masbate	79.9	42
Sorsogon	79.9	52
Compostela Valley	81.7	126
Davao del Norte	81.7	35
Davao del Sur	81.7	64
Davao Oriental	81.7	40
Aklan	82.6	0
Antique	82.6	1
Capiz	82.6	8
Guimaras	82.6	0
Iloilo	82.6	8
Negros Occidental	82.6	26
Marinduque	83.9	0
Occidental Mindoro	83.9	5
Oriental Mindoro	83.9	7
Palawan	83.9	2
Romblon	83.9	0
	LIT 2008	Sigacts 2008
Agusan del Norte	85.7	13
Agusan del Sur	85.7	33
Dinagat Islands	85.7	0
Surigao del Norte	85.7	10
Surigao del Sur	85.7	31
Bukidnon	85.9	14
Camiguin	85.9	0
Lanao del Norte	85.9	57
Misamis Occidental	85.9	8
Misamis Oriental	85.9	7
Batanes	86.1	0
Cagayan	86.1	15
Isabela	86.1	4
Nueva Vizcaya	86.1	3
Quirino	86.1	0
Bohol	86.6	2
Cebu	86.6	0
Negros Oriental	86.6	27
Siquijor	86.6	0
Abra	89.2	11
Apayao	89.2	0
Benguet	89.2	0
Ifugao	89.2	0
Kalinga	89.2	7
Mountain Province	89.2	0
Ilocos Norte	91.3	0
Ilocos Sur	91.3	2
La Union	91.3	0
Pangasinan	91.3	0
Aurora	92.1	10
Bataan	92.1	1
Bulacan	92.1	6
Nueva Ecija	92.1	4
Pampanga	92.1	3
Tarlac	92.1	4
Zambales	92.1	6
Batangas	93.5	5
Cavite	93.5	0
Laguna	93.5	4
Quezon	93.5	28
Rizal	93.5	3
Metropolitan Manila	94	1

Partitioned as <85 and = >85

LIT 2008		*Sigacts 2008*	
Mean	78.68461538	Mean	26.05128
Standard Error	0.700901082	Standard Error	5.436041
Median	79.9	Median	11
Mode	72.9	Mode	0
Standard Deviation	4.377125857	Standard Deviation	33.94806
Sample Variance	19.15923077	Sample Variance	1152.471
Kurtosis	-1.172560803	Kurtosis	3.496179
Skewness	-0.577959538	Skewness	1.953062
Range	12.3	Range	126
Minimum	71.6	Minimum	0
Maximum	83.9	Maximum	126
Sum	3068.7	Sum	1016
Count	39	Count	39
Confidence Level(95.0%	1.418900061	Confidence Level(9	11.00469

LIT 2008		*Sigacts 2008*	
Mean	89.08333333	Mean	7.595238
Standard Error	0.47112829	Standard Error	1.812993
Median	89.2	Median	3.5
Mode	92.1	Mode	0
Standard Deviation	3.053260286	Standard Deviation	11.74954
Sample Variance	9.322398374	Sample Variance	138.0517
Kurtosis	-1.647144832	Kurtosis	7.211788
Skewness	0.212713326	Skewness	2.509448
Range	8.3	Range	57
Minimum	85.7	Minimum	0
Maximum	94	Maximum	57
Sum	3741.5	Sum	319
Count	42	Count	42
Confidence Level(95.0%	0.951462885	Confidence Level(9	3.661414

Hypothesis test: u1 is the group with higher Literacy

Ho: u1-u2

Ha: u1<u2

Test Statistic

$$z = \frac{xbar - ybar}{\sqrt{\left(\frac{\sigma_x^2}{m}\right) + \left(\frac{\sigma_y^2}{n}\right)}}$$

$\bar{x}$ =	7.595238095	mean of x
$\bar{y}$ =	26.05128205	mean of y
σ_x^2 =	138.0516841	sample variance of x
σ_y^2 =	1152.470985	sample variance of y
m =	42	nr of samples of x
n =	39	nr of samples of y
z =	-3.220725307	test statistic
For a one tail test z_α =	-1.644853627	at 5% significance level

Is z<z_α if yes, then reject Ho

if no, then accept Ho

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX M. FUNCTIONAL LITERACY OPENGEODA REGRESSION RESULTS

Functional Literacy 2003

```
Spatial Lag Regression
SUMMARY OF OUTPUT: SPATIAL LAG MODEL - MAXIMUM LIKELIHOOD ESTIMATION
Data set            : phil
Spatial Weight      : philqueen.gal
Dependent Variable  :  Sigacts200  Number of Observations:   81
Mean dependent var  :     16.5062  Number of Variables   :    3
S.D. dependent var  :     30.9301  Degrees of Freedom    :   78
Lag coeff.   (Rho)  :    0.382559


R-squared           :    0.335538  Log likelihood        :   -378.209
Sq. Correlation     : -            Akaike info criterion :    762.418
Sigma-square        :      635.67  Schwarz criterion     :    769.601
S.E of regression   :     25.2125

------------------------------------------------------------------------
    Variable     Coefficient     Std.Error    z-value      Probability
------------------------------------------------------------------------
W_Sigacts200      0.3825591      0.1069641      3.576517    0.0003483
    CONSTANT       127.8753        35.4583      3.606358    0.0003106
     LIT2003      -1.445646      0.4313918      -3.35112    0.0008050
------------------------------------------------------------------------
```

Functional Literacy 2008

```
Spatial Lag Regression
SUMMARY OF OUTPUT: SPATIAL LAG MODEL - MAXIMUM LIKELIHOOD ESTIMATION
Data set            : phil
Spatial Weight      : philqueen.gal
Dependent Variable  :  Sigacts2_3  Number of Observations:   81
Mean dependent var  :     15.6914  Number of Variables   :    3
S.D. dependent var  :     25.5588  Degrees of Freedom    :   78
Lag coeff.   (Rho)  :    0.432771


R-squared           :    0.289632  Log likelihood        :   -366.045
Sq. Correlation     : -            Akaike info criterion :    738.089
Sigma-square        :      464.048  Schwarz criterion     :    745.273
S.E of regression   :     21.5418

------------------------------------------------------------------------
    Variable     Coefficient     Std.Error    z-value      Probability
------------------------------------------------------------------------
W_Sigacts2_3      0.4327715      0.1025258      4.221097    0.0000243
    CONSTANT       82.65304        32.48586      2.544277    0.0109505
     LIT2008     -0.8716447      0.3820072     -2.281749    0.0225041
------------------------------------------------------------------------
```

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX N. MULTIVARIATE NEGATIVE BINOMIAL REGRESSION RESULTS

Sigacts 2003

Negative binomial regression — Number of obs = 81
Dispersion = mean — Wald chi2(6) = 72.99
Log likelihood = -269.44 — Prob > chi2 = 0.0000

sigacts2003	Observed Coef.	Bootstrap Std. Err.	z	P>|z|	Normal-based [95% Conf.	Interval]
ggi2005	-.0158916	.0061672	-2.58	0.010	-.0279791	-.0038041
pi2003	.0064682	.0125382	0.52	0.606	-.0181061	.0310426
lit2003	-.0694146	.023715	-2.93	0.003	-.1158952	-.0229341
eth2003	1.269938	.57021	2.23	0.026	.1523469	2.387529
lnpop5	.8264597	.2361792	3.50	0.000	.363557	1.289362
manila	4.253322	2.25847	1.88	0.060	-.1731974	8.67984
_cons	-1.940922	4.082721	-0.48	0.635	-9.942909	6.061065
/lnalpha	-.108712	.2114749			-.5231952	.3057713
alpha	.8969887	.1896906			.592624	1.357672

Sigacts 2005

Negative binomial regression — Number of obs = 81
Dispersion = mean — Wald chi2(6) = 86.17
Log likelihood = -263.58578 — Prob > chi2 = 0.0000

sigacts2005	Observed Coef.	Bootstrap Std. Err.	z	P>|z|	Normal-based [95% Conf.	Interval]
ggi2005	-.017026	.0076489	-2.23	0.026	-.0320175	-.0020344
pi2003	.0079943	.0102953	0.78	0.437	-.0121842	.0281727
lit2003	-.0459325	.0199905	-2.30	0.022	-.0851131	-.0067519
eth2003	-.0622663	.473411	-0.13	0.895	-.9901349	.8656023
lnpop5	.7993973	.2140066	3.74	0.000	.3799522	1.218842
manila	4.914592	3.031625	1.62	0.105	-1.027283	10.85647
_cons	-2.901939	3.570122	-0.81	0.416	-9.89925	4.095371
/lnalpha	.0681561	.2287064			-.3801001	.5164124
alpha	1.070532	.2448376			.683793	1.676004

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX O. MULTIVARIATE NEGATIVE BINOMIAL REGRESSION RESULTS

Sigacts 2006

```
Negative binomial regression                    Number of obs   =         81
Dispersion     = mean                           Wald chi2(6)    =     164.37
Log likelihood = -272.21227                     Prob > chi2     =     0.0000

------------------------------------------------------------------------------
             |   Observed   Bootstrap                         Normal-based
sigacts2006 |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
     ggi2005 |  -.0117633   .0086172    -1.37   0.172    -.0286528     .0051262
      pi2006 |   .0210781   .0154916     1.36   0.174    -.0092848      .051441
     lit2003 |  -.0254524   .0317162    -0.80   0.422    -.0876151     .0367102
     eth2005 |   .5931967   .4856692     1.22   0.222    -.3586974     1.545091
      lnpop5 |   .8362314   .2392686     3.49   0.000     .3672736     1.305189
      manila |   2.233237   3.106629     0.72   0.472    -3.855645     8.322118
       _cons |  -6.296451   3.790315    -1.66   0.097    -13.72533      1.13243
-------------+----------------------------------------------------------------
    /lnalpha |  -.0581338   .1825386                     -.4159029     .2996353
-------------+----------------------------------------------------------------
       alpha |   .9435237   .1722295                      .6597443     1.349367
------------------------------------------------------------------------------
```

Sigacts 2008

```
Negative binomial regression                    Number of obs   =         81
Dispersion     = mean                           Wald chi2(6)    =     372.30
Log likelihood = -268.99525                     Prob > chi2     =     0.0000

------------------------------------------------------------------------------
             |   Observed   Bootstrap                         Normal-based
sigacts2008 |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
     ggi2008 |   -.001114   .0078185    -0.14   0.887    -.016438     .0142099
      pi2006 |   .0401835   .0186413     2.16   0.031     .0036472     .0767197
     lit2008 |  -.0833906   .0310014    -2.69   0.007    -.1441521    -.022629
     eth2005 |   1.831169   .5569236     3.29   0.001     .7396183     2.922719
      lnpop5 |    1.06465   .2597656     4.10   0.000     .5555186     1.573781
      manila |  -2.955112    2.89257    -1.02   0.307    -8.624444     2.714221
       _cons |   -6.82612   4.008588    -1.70   0.089    -14.68281     1.030569
-------------+----------------------------------------------------------------
    /lnalpha |   .3943571   .2078313                     -.0129847     .8016989
-------------+----------------------------------------------------------------
       alpha |    1.48343   .3083032                      .9870992     2.229325
------------------------------------------------------------------------------
```

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX P. MULTIVARIATE OPENGEODA REGRESSION RESULTS

Sigacts 2003

```
SUMMARY OF OUTPUT: SPATIAL ERROR MODEL - MAXIMUM LIKELIHOOD ESTIMATION
Data set            : updated_shp_07_may
Spatial Weight      : updated_shp_16_may.gal
Dependent Variable  :  Sigacts200   Number of Observations:   81
Mean dependent var  :   16.728395  Number of Variables   :    7
S.D. dependent var  :   35.163819  Degrees of Freedom    :   74
Lag coeff. (Lambda) :    0.293981


R-squared           :    0.312202  R-squared (BUSE)      : -
Sq. Correlation     : -           Log likelihood        : -389.173706
Sigma-square        :     850.458  Akaike info criterion :     792.347
S.E of regression   :     29.1626  Schwarz criterion     :     809.109

------------------------------------------------------------------------
    Variable     Coefficient       Std.Error     z-value      Probability
------------------------------------------------------------------------
    CONSTANT       168.5851        62.46826       2.698732    0.0069605
     GGI2005      -0.2418589       0.1943395      -1.244518    0.2133092
     LIT2003       -1.748774       0.6589103      -2.654039    0.0079536
     ETH2003        16.53384        14.72092       1.123153    0.2613727
      PI2003      0.09034681       0.3667846      0.2463212    0.8054337
  Populati_1    7.976756e-06     5.967545e-06         1.33669
0.1813240
      MANILA       21.77387        109.5963      0.1986733    0.8425184
      LAMBDA      0.2939806        0.126719        2.31994    0.0203441
------------------------------------------------------------------------
```

Sigacts 2005

```
SUMMARY OF OUTPUT: SPATIAL ERROR MODEL - MAXIMUM LIKELIHOOD ESTIMATION
Data set            : updated_shp_07_may
Spatial Weight      : updated_shp_16_may.gal
Dependent Variable  :  Sigacts2_1   Number of Observations:   81
Mean dependent var  :   12.370370  Number of Variables   :    7
S.D. dependent var  :   14.703191  Degrees of Freedom    :   74
Lag coeff. (Lambda) :    0.400188


R-squared           :    0.387001  R-squared (BUSE)      : -
Sq. Correlation     : -           Log likelihood        : -314.859959
Sigma-square        :      132.52  Akaike info criterion :      643.72
S.E of regression   :     11.5118  Schwarz criterion     :     660.481

------------------------------------------------------------------------
    Variable     Coefficient       Std.Error     z-value      Probability
------------------------------------------------------------------------
    CONSTANT       105.4136        25.21895       4.179937    0.0000292
     GGI2005      -0.2131364      0.07708803      -2.764844    0.0056951
     LIT2003      -0.8450074       0.2664088      -3.171845    0.0015149
     ETH2003       -4.021726        6.021284     -0.6679184    0.5041855
      PI2003      -0.07464836       0.1453434     -0.5135998    0.6075318
  Populati_1    3.754092e-06     2.390796e-06         1.570227
0.1163623
      MANILA       48.37519         43.0793       1.122934    0.2614658
      LAMBDA      0.4001882       0.1145879       3.492413    0.0004788
------------------------------------------------------------------------
```

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX Q. MULTIVARIATE OPENGEODA REGRESSION RESULTS

Sigacts 2006

```
SUMMARY OF OUTPUT: SPATIAL ERROR MODEL - MAXIMUM LIKELIHOOD ESTIMATION
Data set            : updated_shp_07_may
Spatial Weight      : updated_shp_16_may.gal
Dependent Variable  :  Sigacts2_2   Number of Observations:   81
Mean dependent var  :   13.469136  Number of Variables   :    7
S.D. dependent var  :   15.441716  Degrees of Freedom    :   74
Lag coeff. (Lambda) :    0.262700


R-squared           :    0.292911  R-squared (BUSE)      : -
Sq. Correlation     : -            Log likelihood        : -323.416999
Sigma-square        :     168.603  Akaike info criterion :     660.834
S.E of regression   :     12.9847  Schwarz criterion     :     677.595

------------------------------------------------------------------------
    Variable     Coefficient       Std.Error     z-value      Probability
------------------------------------------------------------------------
    CONSTANT       78.29228        28.24976       2.771432    0.0055812
     GGI2005     -0.2186826      0.07837856      -2.790082    0.0052696
      PI2006     -0.01699938       0.1373659     -0.1237525    0.9015111
     LIT2003     -0.5293695       0.3051344      -1.734873    0.0827632
     ETH2005     -0.8343167        6.476127     -0.1288296    0.8974924
   Populati_1    4.138062e-06     2.52376e-06       1.639642    0.1010796
      MANILA       38.79308        44.85428      0.8648692    0.3871105
      LAMBDA      0.2626999         0.12984       2.023259    0.0430463
------------------------------------------------------------------------
```

Sigacts 2008

```
SUMMARY OF OUTPUT: SPATIAL LAG MODEL - MAXIMUM LIKELIHOOD ESTIMATION
Data set            : updated_shp_07_may
Spatial Weight      : updated_shp_16_may.gal
Dependent Variable  :  Sigacts2_3  Number of Observations:   81
Mean dependent var  :     16.4815  Number of Variables   :    8
S.D. dependent var  :     26.3739  Degrees of Freedom    :   73
Lag coeff.   (Rho)  :    0.409124


R-squared           :    0.358191  Log likelihood        :     -364.15
Sq. Correlation     : -            Akaike info criterion :     744.299
Sigma-square        :     446.431  Schwarz criterion     :     763.455
S.E of regression   :     21.1289

------------------------------------------------------------------------
    Variable     Coefficient       Std.Error     z-value      Probability
------------------------------------------------------------------------
W_Sigacts2_3      0.4091237       0.1024688       3.992665    0.0000654
    CONSTANT        86.5911        41.88352       2.067427    0.0386938
     GGI2008    -0.07972682       0.1230278     -0.6480391    0.5169595
     LIT2008     -0.9409866       0.4736619      -1.986621    0.0469643
     ETH2005       13.31789        9.460339        1.40776    0.1592022
      PI2006     0.08758801       0.2078253      0.4214502    0.6734265
   Populati_1   4.490879e-06    3.972954e-06       1.130363    0.2583236
      MANILA      -17.09002        72.97575     -0.2341877    0.8148394
------------------------------------------------------------------------
```

THIS PAGE INTENTIONALLY LEFT BLANK

LIST OF REFERENCES

Aben, Elena L. "AFP Cites Gains of Internal Security Plan." *The Manila Bulletin Newspaper Online*. Manila, Philipppines, July 19, 2011, sec. Main News. http://www.mb.com.ph/articles/267733/afp-cites-gains-internal-security-plan.

Abinales, P. N, and Donna J Amoroso. *State and society in the Philippines*. Lanham, MD: Rowman & Littlefield Publishers, 2005.

Abuza, Zachary, and Army War College (U.S.). Strategic Studies Institute. *Balik-terrorism the return of the Abu Sayyaf*. Carlisle, PA: Strategic Studies Institute, U.S. Army War College, 2005. http://purl.access.gpo.gov/GPO/LPS64419.

Addison, Tony, and Chronic Poverty Research Centre. *Chronic Poverty Report 2008-09□: escaping poverty traps*. Manchester; U.K.: Chronic Poverty Research Centre, 2008.

Alesina, Alberto, and Eliana La Ferrara. "Ethnic Diversity and Economic Performance." *Journal of Economic Literature, American Economic Association* 43, no. 3 (September 2005): 762–800.

"Almost Nine Out of Ten Filipinos Are Functionally Literate." *Literacy Coordinating Council*, n.d. http://lcc.deped.gov.ph/lcc/index.php?option=com

Anderson, Christopher J, and Aida Paskeviciute. "How Ethnic and Linguistic Heterogeneity Influence the Prospects for Civil Society: A Comparative Study of Citizenship Behavior." *The Journal of Politics* 68, no. 4 (2006): 783–802.

Anselin, Luc. *What is special about spatial data?□: alternative perspectives on spatial data analysis*. [Santa Barbara, Calif.]: National Center for Geographic Information and Analysis, 1989.

Asian Development Bank. *Poverty in the Philippines□: causes, constraints, and opportunities.* Mandaluyong City, Philippines: Asian Development Bank, 2009.

Baker, Richard W., and Charles E. Morrison. *Asia Pacific Security Outlook*. Japan Center for International Exchange, 2005.

Balisacan, Arsenio M, and Ernesto M Pernia. "The Rural Road to Poverty Reduction: Some Lessons from the Philippine Experience." *Journal of Asian and African Studies* 37, no. 2 (April 1, 2002): 147–167.

Berrebi, C. "Evidence About The Link Between Education, Poverty and Terrorism Among Palestinians." *Working Paper- Princeton University Industrial Relations Section*, No. 477 (2003).

Borer, Douglas A. *Superpowers Defeated: Vietnam and Afghanistan Compared*. Portland: Frank Cass Publishers, 1999.

Bossert, Walter, Conchita D'Ambrosio, and Eliana La Ferrara. "A Generalized Index of Fractionalization", June 2005. http://hdl.handle.net/1866/2214.

"Brief History." *Literacy Coordinating Council*, n.d. http://lcc.deped.gov.ph/lcc/index.php?option=com

Bruin, J. "Newtest: Command to Compute New Test." *UCLA Academic Technology Services, Statistical Consulting Book*, 2006. http://www.ats.ucla.edu/stat/stata/faq/countfit.htm.

"Central Limit Theorem in Statistics", n.d. http://www.stattucino.com/berrie/clt.html.

Cheema, G. Shabbir, and Dennis A Rondinelli. "Devolution Toward Democracy: Lessons for Theory and Practice from the Philippines by Ledivina V Carino." In *Decentralizing governance : emerging concepts and practices*. [Cambridge, Mass.]; Washington, D.C.: Ash Institute for Democratic Governance and Innovation, John F. Kennedy School of Government, Harvard University ; Brookings Institution Press, 2007.

"CIA - The World Factbook." *Philippines*, n.d. https://www.cia.gov/library/publications/the-world-factbook/geos/rp.html.

Colletta, Nat J., Teck Ghee Lim, Anita Kelles-Viitanen, World Bank, and Asian Development Bank. Social Development Division. *Social Cohesion and Conflict Prevention in Asia: Managing Diversity Through Development*. World Bank Publications, 2001.

Collier, Paul, Anke Hoeffler, and World Bank. Development Research Group. *Greed and Grievance in Civil War*. World Bank, Development Research Group, 2000.

Collier, Paul, and Anke Hoeffler. *On Economic Causes of Civil War*. University of Oxford. Centre for the study of African economies, 1998.

Collier, Paul, Anke Hoeffler, Måns Söderbom, and World Bank. Development Research Group. Office of the Director. *On the Duration of Civil War*. World Bank Publications, 2001.

Counihan, Michael. *Determinants of insurgency activity in Afghanistan a cross-provincial analysis*, 2011. http://worldcat.org/oclc/747816964/viewonline.

Cusi, Cyril. "The Vulnerability Index of the Country's 75 Provinces to CPP-NPA-NDF Insurgency: An Application of Multivariate Statistical Techniques". Masters in Statistics, University of the Philippines, 1996.

Deininger, Klaus W, and World Bank. Development Research Group. Rural Development. *Causes and consequences of civil strife□: micro-level evidence from Uganda*. Washington, D.C.: World Bank, Development Research Group, Rural Development, 2003.

Espino, Irineo C. "Counterinsurgency [electronic Resource]: The Role of Paramilitaries". Naval Postgraduate School (U.S.). Department of National Security Affairs, 2004.

Everton, Sean. *Disrupting Dark Networks*. Cambridge General Academic, 2012.

Everton, Sean. "Lab Assignment 7, Statistical Analysis of Geospatial Data". Naval Postgraduate School, n.d.

Fearon, James D, and David D Laitin. "Ethnicity, Insurgency, and Civil War." Edited by Rajat Ganguly. *Ethnic Conflict* 2 (2009): 77–104.

"FMI 3-07.22 Counterinsurgency Operations." US Army, October 2004.

Friedman, Thomas L. *From Beirut to Jerusalem*. Revised ed. Picador, 2012.

Friedman, Willa, Michael Kremer, Edward Miguel, and Rebecca Thornton. *Education as Liberation?* NBER Working Paper Series 16939. Cambridge: National Bureau of Economic Research, 2011. http://papers.nber.org/papers/w16939.

Garrido, Marco. "The Evolution of Philippine Muslim Insurgency." *Asia Times Online*, n.d. http://www.atimes.com/atimes/Southeast_Asia/EC06Ae03.html.

"GDP Philippines." *Index Mundi*, n.d. http://www.indexmundi.com/g/g.aspx?c=rp&v=66.

GeoDa Spatial Autocorrelation, 2010. http://www.youtube.com/watch?v=esjIfIoJ_0w&feature=youtube_gdata_player.

Glad, Marit, CARE/International, and World Bank. *Knowledge on Fire: Attacks on Education in Afghanistan, Risks and Measures for Successful Mitigation*. CARE, 2009.

Goodhand, Jonathan, and Chronic Poverty Research Centre. *Violent Conflict, Poverty and Chronic Poverty.* Chronic Poverty Research Centre, 2001.

Goodhand, Jonathan. "Enduring Disorder and Persistent Poverty: A Review of the Linkages Between War and Chronic Poverty." *World Development* 31, no. 3 (March 2003): 629–646.

Gray, Cheryl W., and Daniel Kaufman. “Corruption and Development.” In *State of Corruption, State of Chaos: The Terror of Political Malfeasance*, edited by Michaelene Cox. Lexington Books, 2008. http://info.worldbank.org/etools/docs/library/18125/gray.pdf.

Gurr, Ted Robert, and Barbara Harff. *Ethnic Conflict in World Politics*. Westview Press, 1994.

Gurr, Ted. *Why Men Rebel*. Princeton University Press, 1970.

Hamilton, Lawrence C. *Modern Data Analysis: A First Course in Applied Statistics*. Pacific Grove, California: Brooks/Cole Publishing Co, 1990.

Hastings, Jonathan P, and Krishnamurti A Mortela. “The Strategy-Legitimacy Paradigm: Getting It Right in the Philippines.” Naval Postgraduate School, 2008.

Hazelton, Jacqueline L. *Compellence in Counterinsurgency Warfare: The Uses of Force in Dhofar, Oman, and El Salvador*. Washington DC: Paper prepared for delivery at the American Political Science Association conference, September 4, 2010.

Hernandez, Carolina G. *Institutional Responses to Armed Conflict: The Armed Forces of the Philippines*. Paper submitted to the Human Development Network Foundation for the Philippine Human Development Report, 2005.

Hernandez, Carolina. *The AFP’s Institutional Responses to Armed Conflict a Continuing Quest for the Right Approach*. Makati City: Philippine institute for development studies (PIDS), 2006.

Huntington, Samuel. “The Clash of Civilizations.” *Foreign Affairs* 72, no. 3 (n.d.). http://www.foreignaffairs.com/articles/48950/samuel-p-huntington/the-clash-of-civilizations.

“Indigenous People’s Rights.” *National Commission on Indigenous People*, n.d. http://www.ncip.gov.ph/Issuances/IPRAIRR.aspx.

“Internal Peace and Security Plan”. Armed Forces of the Philippines, 2011.

International Committee of the Red Cross (ICRC). “How Is the Term ‘Armed Conflict’ Defined in International Humanitarian Law?” International Committee of the Red Cross (ICRC), March 2008. http://www.unhcr.org/refworld/docid/47e24eda2.html.

International Crisis Group. “The Communist Insurgency in the Philippines Tactics and Talks.”, 2011. http://www.crisisgroup.org/~/media/Files/asia/south-east-asia/philippines/202%20The%20Communist%20Insurgency%20in%20the%20Philippines%20Tactics%20and%20Talks.ashx.

Jones, Gregg R. *Red Revolution: Inside the Philippine Guerrilla Movement*. Westview Press, 1989.

Justino, Patricia. *On the Links Between Violent Conflict and Chronic Poverty: How Much Do We Really Know?* Manchester: Chronic Poverty Research Centre, 2006.

Justino, Patricia. "Redistribution, Inequality and Political Conflict." *Poverty Research Unit, Sussex, PRUS Working Paper*, no. 18 (2004).

Kreuzer, Peter. "Democracy, Diversity, and Conflict: Managing Ethnic Divisions in the Philippines and Malaysia." *Cornell University Peace Studies Program Occasional Paper*, no. 30–4 (2006).

Levine, Ned, Dominique Lord, and Byung-Jung Park. "CrimeStat Version 3.3 Update Notes: Part 2: Regression Modeling," July 2010.

"Local Government Code of the Philippines: An Overview." *Herald Digital Law Philippines*, n.d. http://philippineslaw.wordpress.com/2011/04/19/local-government-code-of-the-philippines-an-overview/.

Long, J. Scott, and Jeremy Freese. *Regression Models for Categorical Dependent Variables Using Stata*. Second. College Station, Texas: Stata Press, 2006.

Luga, Alan R. "Muslim insurgency in Mindanao, Philippines." U.S. Army Command and General Staff College, 2002.

Lum, Thomas. *The Republic of the Philippines and US Interests*. Congressional Research Service, January 3, 2011.

McCormick, Gordon H., Steven B. Horton, and Lauren A. Harrison. "Things Fall Apart: The Endgame Dynamics of Internal Wars." *Third World Quarterly* 28, no. 2 (January 1, 2007): 321–367.

McCormick, Gordon. "The Political Control and Societal Equilibrium Model" presented at the Lecture presented during Dr. McCormick's Seminar on Guerrilla Warfare, . Monterey, CA, January 2011.

Montesano, Michael J. "The Philippines in 2003: Troubles, None of Them New." In *Asian Survey*. Vol. 44. 1-3. University of California Press, 2004.

Mueller, John. "The Banality of Ethnic War." *Peace Research Abstracts* 40, no. 6 (2003).

National Economic and Development Authority. *Medium-term Philippine development plan, 2004-2010.* Manila: National Economic and Development Authority, 2004.

"National Internal Security Plan (NISP)." The Government of the Philippines, 2001.

National Unification Commission (Philippines). *National Unification Commission report to President Fidel V. Ramos on the pursuit of a comprehensive peace process*. Quezon City: National Unification Commission, 1993.

"NSCB - Good Governance Index (GGI) - Technical Notes." *National Statistical Coordination Board*, n.d. http://www.nscb.gov.ph/ggi/techNotes.asp.

"NSCB - Notes on Official Poverty Statistics in the Philippines." *National Statistical Coordination Board*, n.d. http://www.nscb.gov.ph/technotes/poverty/intro.asp.

"NSCB - Statistics - Population and Housing." *National Statistical Coordination Board*, n.d. http://www.nscb.gov.ph/secstat/d_popn.asp.

Parwez, Md Shahid. *An Empirical Analysis of the Conflict in Nepal*. Asian Development Bank, July 2006.

Pena, Leonardo I. "Finding the Missing Link to a Successful Philippine Counterinsurgency Strategy." Masters thesis, Naval Postgraduate School (U.S.), 2007.

"Philippine Constitution: Article XIV." *The 1987 Constitution of the Philippines*, n.d. http://philippineconstitution1987.wordpress.com/2009/01/11/philippine-constitution-article-xiv/.

"Philippine Education Issues." *The Internet 1996 World Exposition*, n.d. http://www.ph.net/htdocs/education/issue.htm.

Philippine Human Development Report 2005: Peace, Human Security and Human Development in the Philippines. Human Development Network, 2006.

"President Aquino's State of the Nation Address." *GMA News Online*. Manila, Philipppines, July 25, 2011. http://ph.news.yahoo.com/president-aquinos-state-nation-address-english-092907013.html.

Quismundo, Tarra. "Philippine Education Spending Still Below UN Standard." *Inquirer Global Nation*, n.d. http://globalnation.inquirer.net/31229/philippine-education-spending-still-below-un-standard.

Richmond, Mark, Clinton Robinson, and Margarete Sachs-Israel. *The Global Literacy Challenge: A Profile of Youth and Adult Literacy at the Mid-point of the United Nations Literacy Decade 2003-2012*. Paris: Unesco, 2008.

Rotberg, Robert I. *When States Fail: Causes and Consequences*. Princeton University Press, 2004.

Santos Jr, Soliman. *Evolution of the Armed Conflict on the Communist Front*. Human Development Network Foundation, Inc. for the Philippine Human Development Report, 2005.

Schelling, Thomas C. *Arms and Influence*. Yale University Press, 2008.

Smith, Dan. "Trends and Causes of Armed Conflict". Berghof Research Center for Constructive Conflict Management. 2004.

Spatial Regression in OpenGeoDa, 2010. http://www.youtube.com/watch?v=5YXSwVLT4mI&feature=youtube_gdata_player.

Sriram, Chandra, Judith Large, and Stephen Brown. "Governance in Conflict Prevention and Recovery: A Guidance Note". United Nations Development Programme, 2009.

"Terrorism 2002-2005." *Federal Bureau of Investigation*, n.d. http://www.fbi.gov/stats-services/publications/terrorism-2002-2005/terror02_05.

"The NISP Roundtable Discussions". Office of Strategic and Special Studies, Armed Forces of Philippines, 2010.

The Philippines in Figures 2011. Manila, Philipppines: National Statistics Office, 2011.

The Philippines: A New Strategy for Peace in Mindanao. Asia Briefing N'125. Jakarta/Brussels: International Crisis Group, 2011.

Thompson, Sir Robert Grainger Ker. *Defeating Communist Insurgency: Experiences from Malaya and Vietnam*. Chatto & Windus, 1966.

Tuano, Philip Arnold. *Strengthening Dialogue and Socio-economic Development Amidst Conflict in the Philippines*. A Background paper submitted to the Human Development Network Foundation, Inc. for the Philippine Human Development Report, 2005.

"What Is Good Governance". UN Economic and Social Commission for Asia and the Pacific, 2012. http://www.unescap.org/pdd/prs/ProjectActivities/Ongoing/gg/governance.asp.

"What Is Literacy?" *Literacy Coordinating Council*, n.d. http://lcc.deped.gov.ph/lcc/index.php?option=com

Wikipedia contributors. "Bayanihan." *Wikipedia, the Free Encyclopedia*. Wikimedia Foundation, Inc., April 12, 2012. http://en.wikipedia.org/w/index.php?title=Bayanihan&oldid=486940808.

———. “Demographics of the Philippines.” *Wikipedia, the Free Encyclopedia*. Wikimedia Foundation, Inc., April 13, 2012. http://en.wikipedia.org/w/index.php?title=Demographics_of_the_Philippines&oldid=486554828.

———. “Ethnic Groups in the Philippines.” *Wikipedia, the Free Encyclopedia*. Wikimedia Foundation, Inc., April 12, 2012. http://en.wikipedia.org/w/index.php?title=Ethnic_groups_in_the_Philippines&oldid=486585774.

———. “Multiculturalism.” *Wikipedia, the Free Encyclopedia*. Wikimedia Foundation, Inc., May 2, 2012. http://en.wikipedia.org/w/index.php?title=Multiculturalism&oldid=490231702.

———. “Philippines.” *Wikipedia, the Free Encyclopedia*. Wikimedia Foundation, Inc., April 13, 2012. http://en.wikipedia.org/w/index.php?title=Philippines&oldid=487107733.

———. “Poverty.” *Wikipedia, the Free Encyclopedia*. Wikimedia Foundation, Inc., May 11, 2012. http://en.wikipedia.org/w/index.php?title=Poverty&oldid=490961276.

Wolff, Jonathan. “Karl Marx.” *The Stanford Encyclopedia of Philosophy*. Spring 2011 Edition (n.d.). http://plato.stanford.edu/archives/spr2011/entries/marx/.

INITIAL DISTRIBUTION LIST

1. Defense Technical Information Center
   Ft. Belvoir, Virginia

2. Dudley Knox Library
   Naval Postgraduate School
   Monterey, California

3. Prof Nancy Roberts
   Naval Postgraduate School
   Monterey, California

4. Prof Sean Everton
   Naval Postgraduate School
   Monterey, California

5. Prof Kristen Tsolis
   Naval Postgraduate School
   Monterey, California

6. Prof William Fox
   Naval Postgraduate School
   Monterey, California

7. The Secretary
   Department of National Defense
   Quezon City, Philippines

8. The Chief of Staff
   Armed Forces of the Philippines
   Quezon City, Philippines

9. The Deputy Chief of Staff for Operations, J3
   Armed Forces of the Philippines
   Quezon City, Philippines

10. Office of the Deputy Chief of Staff for Education and Training, J8
    General headquarters, Armed Forces of the Philippines
    Camp Aguinaldo, Quezon City, Philippines

11. Office of the Assistant Chief of Staff for Operations, G3
    Headquarters, Philippine Army
    Fort Andres Bonifacio, Makati City, Philippines

12. Office of the Assistant Chief of Staff for Education and Training, G8
Headquarters, Philippine Army
Fort Andres Bonifacio, Makati City, Philippines