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ECONOMIC CHANGE AND VIOLENCE IN CROSS-NATIONAL, REGIONAL, AND

LOCAL PERSPECTIVES

by

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CERTIFICATE OF APPROVAL

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PH.D. THESIS

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CHAPTER I
INTRODUCTION

Over the past half century or so, economic structures of nations have been shifting and changing at a tremendous rate. One dimension of this change is the convergence of national economies along the lines of similar liberal economic principles; even allowing for some national economic variation (Block 1991), the principles of free markets and profit generation have emerged as dominant organizing themes for economies (Fukuyama 1992). While this liberal economic organization has produced booms as nations develop and profits are created, the same liberal economic order has also produced periodic busts. Markets fail, profits flee to find higher rates of return, and oversupply creates dangerous fluctuations in prices (Hobsbawm 1994; Schumpeter 1942/1976), thus threatening the standard of living. In addition, globalization is ubiquitous. Economies become more linked and also benefit from increases to scale and also reap profit growth from outsourcing and specialization. However, while linkages create growth they also shackle nations together; in the interconnected global marketplace economic issues and financial crises can rapidly spread across interdependent economic and financial systems. Further, the interdependence of national economies often constrains national policy responses to the strains and pressures of economic change (Waters 2001). The very logic of liberal economic organization creates both growth and crisis while it binds nations together.

Concurrent with these large scale economic changes has been a global increase in levels of personal violence. Comparative criminologists describe this increase as a "surge" (LaFree and Drass 2002; LaFree and Tseloni 2006). Cross-nationally, the evidence shows that during the last four decades of the twentieth century, global homicide rates have on average doubled (LaFree and Drass 2002). Some argue this crime boom was especially prevalent in the industrialized world (Fukuyama 1999), while others find evidence that booms in violence were limited to industrializing nations

(LaFree and Drass 2002). More recent research explores the increase in violence in select groups of nations undergoing political and economic transitions, for example in the former Soviet Union (Pridemore and Kim 2006), the former Eastern Bloc nations (Karstedt 2003; Stamatel 2008; 2009) as well as East Asian nations undergoing rapid economic change (Liu 2005; Joo 2003; Joo and Yoon 2008).

The present research will inquires about the relationship between the economy and interpersonal violence. However, rather than just speculating that a poor economy exacerbates violence, I will allow for the possibility that economic development or economic crisis can lead to increases in violence. In addition, I am interested in how social and political institutions can help buffer any harmful effects of extreme economic booms or acute economic crashes.

Additionally, this research will consider the relationship between the economy and violence in a comparative manner, considering the relationship across several different contexts. Much of the current research in comparative criminology focuses on relationships among variables across nations, usually analyzing 50 or so nations at one time. This research will also use a similar cross-national analytical set. However, I will focus the analysis by examining one nation in particular, South Korea, chosen specifically because it has seen both economic boom and economic bust. Findings from this national time-series analysis of violence will then be compared with a larger set of East Asian nations and then finally with a cross-national data set. Analyzing the economy and violence across national, regional, and cross-national levels will give a rich comparison, one not seen in many of the extant studies.

South Korea is a specific example of a nation that has undergone tremendous economic growth and tremendous economic crisis. As Korea reaped the rewards of a "big push" towards export-oriented manufacturing in heavy and chemical industries, the economy grew by about 12 percent per year from 1985 to 1988, dropping to about eight

percent growth per year by the end of that decade. However, about 10 years later, Korea also saw economic catastrophe; in the wake of the 1997 Asian Financial Crisis, in a few short months the Korean currency lost over half of its value and the gross national policy dropped in global ranking from 11th to 17th place (for a succinct accounting of the growth and crisis see Cumings 2005). The inclusion of this single, national-level analysis, combined with the regional and cross-sectional data sets will move the theorizing on the causes of violence beyond a simple assumption that the mechanics of violence operate in the same manner across all national and cultural contexts.

This study will use two independent measures of personal violence, suicide and homicide. By including two indicators of violence, this research follows in the spirit of earlier work which generalized violence into actions directed against the self or actions directed against others (Henry and Short 1954; Unnithan et al. 1994).   I do not make the assumption that suicide and homicide are completely distinct forms of violent behavior but I instead ask if these behaviors are responsive to similar structural causes. In analyzing both forms of violence, this study contributes to cross-national and comparative criminology, where research commonly explores only one form of violence or the other (LaFree 1999; Stack 2000a, 2000b).

In order to make the case for starting the analysis at the national level, Chapter 2, introduces the story of economic development in Korea. I present the contours of tremendous economic growth during the early 1970s and 1980s, as well as the sudden economic downturn in the latter portion of the 1990s. In Chapter 3, I lay out the theoretical frameworks used in the study to explain the linkages between the economy and violence. I will use Durkheim's ideas of modernization to argue for a positive link between economic growth and violence, Merton's anomie theory to state a negative relationship between the economy and violence, and ideas from Messner and Rosenfeld's Institutional Anomie Theory (IAT) to explain how the non-economic institutions of

society and the state might intervene in the economy – violence relationship. Empirically testable hypotheses will be taken from each of these approaches. In Chapter 4, I will present the data used in this study. This presentation will describe the various sources of data, the operationalization of specific variables, and all analytical methods. In Chapter 5, I will analyze the relationship between the economy and violence in Korea between 1985 and 2006. I will focus first on bivariate relationships between the economy and violence and then the economy and meaningful control variables. Then, I turn to multivariate time-series regressions to explore the theoretically specified hypotheses. In Chapter 6, I will assess the hypotheses in a regional and cross-national context; general comparisons will be made between the data sets in order to highlight divergent findings and similarities. Finally, Chapter 7 will conclude the dissertation by relating empirical findings back to the theoretical presentation. In addition, I will turn to the area studies literature and research on Korea in order to explain interesting and unusual findings from the national analysis. These specific details from the Korean case will be used to suggest directions for future work on the macro-economic causes of violence.

CHAPTER II
KOREA AND ECONOMIC CHANGE: BOOM AND BUST
Boom: The Asian Miracle

Modern Korean economic take-off and growth is best understood in the context of

the economic development of the Asia-Pacific region during the 1970s, 1980s and 1990s

when tremendous export-oriented economic development occurred in several Asian

economies. The speed of economic transformation in this region has been called the

"Asian Economic Miracle" as several East Asian nations began export-oriented growth in

a very short time frame. Korea was among these nations. The nickname "The Miracle

on the Han River" is used to describe the massive change in the state of the Korean

economy from the immediate post-World War II period to modernization and

industrialization and participation in the modern globalized economy.[1]

The Korean economic take-off can be traced back to government policy actions of

the early 1960s, when Korean president Park Chung-Hee coerced big business leaders to

channel corporate profits into specifically targeted industries and industrial sectors, "from

agriculture to industry, from mercantilist and rent-seeking activities to industrial

manufacturing, and from domestic sales to exports" (Kim 1997: 102). This direction of

resources was in part to punish industry captains for profiteering and corruption during

the previous political regime (Cummings 2005). However, these policy decisions were

also directed towards the modernization and rationalization of industry, based on regional

Asian models.

Scholars date the setting of the pro-growth policy environment to President Park's

1973 New Year's address when he announced intentions to focus national development

and export towards heavy and chemical industrialization (HCI), consisting of steel,

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[1] The Han River, which runs east and west through the capital city of Seoul, is the major
waterway in South Korea.

autos, ships, and machines (Cummings 2005). This policy shift is notable because it was a bold departure from the foreign aid dependent political economy of the immediate post-war period. It also signaled that Korea was not going to be satisfied with having an economy which was based solely on the production of cheap consumer-stuffs, such as shoes, textiles, and wigs.

State-led industrialization, at the hands of a "developmental state" (Johnson 1982; Woo 1999) featured the use of some unique policy tools to achieve the desired product mixes and macro transformations.[2] These policy tools included state allocation of business licenses to targeted sectors and firms, government control of the financial sector and the directed allocation of financial instruments and policies towards specific businesses or conglomerates (Woo 1991), and the use of tax policy to punish businesses which deviated from state developmental goals (Amsden 1992; Eckhart et al.. 1990). Underlying these developmental policies was a strong authoritarian state which was willing to exert formal and informal control over business and society alike.

While the state was concerned about what was being produced, it was also clear the goal of this industrialization push was the complete economic restructuring of Korea itself. A look at the macroeconomic indicators shows the success of these efforts. Between 1970 and 1990 the gross national income per capita increased by about 23 times, rising from $210 to $5883 per person. Figures from the Bank of Korea show the unemployment rate was low during the export-heavy 1980s, averaging just over three

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[2] The concept of the developmental state has been used by political economists and political sociologists to describe the unique state-capital-society relationships found in the East Asian economies during the post-World War II period. The concept attempts to describe political economies which fit neither into the capitalist laissez faire paradigm nor into the socialist model. In general it describes a strong state which directs capitalist growth by directing industrial efforts into targeted sectors. Commonly society and labor have been subject to discipline and control in order achieve production efficiency and reduce externalities. At the same time, society and labor share somewhat in the material benefits of growth.

percent for the latter portion of that decade. Production of HCI and higher quality consumer goods for the international and global markets led to export figures which increased more than 72 times during this two decade period. During this period of export-led growth, two Korean conglomerates (otherwise known as chaebol) Samsung and Hyundai, were counted among the fifty largest business firms in the world.

The Miracle on the Han brought with it massive changes to Korean society. Demographically, there was a shift from rural to urban areas; in 1960 about 28% of Korea's population lived in urban areas, by 1980 that number had jumped to 57% (Koo 2001). Fertility patterns began to reflect a nation moving away from traditional patterns and shifting towards modernity. Family organization and structure also began to shift, not a trivial matter in a society which rested on strong Confucian understandings of the proper ordering of society based upon idealized familial relationships and responsibilities.

<div align="center">Bust: The Asian Crisis</div>

Korean economic growth was Janus-faced. Along with the structural and social transformation came industrial abuses and labor disputes (Koo 2001). But, the most severe feature of Korean economic development actually took some time to fully manifest. Moving forwards through the 1980s and 1990s, there was a justified feeling of national pride which swept through Korea; Korea was soon to enter into the Organization for Economic Cooperation and Development (OECD) – the rich nations club, so to speak and an objective indicator and validator of policies and decisions made decades before. In the political dimension, Korea was soon to shrug off decades of authoritarian rule as longtime democratic activist and former dissident Kim Dae-Jung poised for the upcoming presidential election in the fall of 1997.

But there was also an economic storm approaching, originating in Southeast Asia and spreading outward. Business investors, international financial figures, and currency speculators began to doubt the stability of national currencies and continued economic growth in the region. The Asian Financial Crisis began in the summer of 1997 with a currency run in Thailand; because of a large foreign debt Thailand was effectively bankrupt and foreign investors withdrew capital from Thai assets. Because of the large amount of regional cross-holdings and investments, where nations and businesses maintained investments in other regional economies, ripple effects were felt throughout Asia, including Indonesia, Hong Kong, Malaysia, Laos, and the Philippines as investors began to move their assets out of the area.[3]

In the early fall of 1997 Korea found itself mired in the Asian Economic Crisis. And, despite the regional character and origins of the crisis, the Korean experience was not only attributable to regional contagion effects, but also partially to domestic policies and factors.

Along with a dearth of foreign currency holdings, Korea had structural economic characteristics which made its situation very precarious. Some of domestic factors driving the crisis in Korea were the very same correlates of the economic take-off during the high growth period. The first of these was Korean foreign investment in other troubled Asian economies. Growing costs of labor in Korea had forced business and industry to offshore production. Thus, Korean capital ventured to the developing economies of South and Southeast Asia in search of cheaper labor and a higher rate of return. This is of course a classic pattern of economic growth. These linkages provided a mechanism for regional contagion effects between national economies.

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[3] For an overall review of the Asian Economic Crisis with an emphasis on the political backdrop to the events of the summer and fall of 1997, see T.J. Pemple, ed., (1999), *The Politics of the Asian Economic Crisis*, Ithaca, NY: Cornell University Press.

Perhaps most important among the domestic and policy factors, as overseas investors became fearful of their holdings in Korea they began to scrutinize more closely the financial fundamentals there. One key fact coming to light during this time was the very high debt-to-equity ratios of Korean firms. Also, it became very clear that the banking sector was holding many non-performing loans. Many of these instruments were themselves backed by the Korean government, in general the Korean state would guarantee loans to the private sector from banks, all in part of the larger goals of the developmental state. National bankruptcy loomed when the state, as guarantor of last resort, could not pay back loans which were non-performing and thus there was a fear of national bankruptcy.

An immediate impact of the Korean financial crisis was a devaluation of the Korean won as investors fled the currency for safe investments. This devaluation, by about half from 1700 won per dollar to about 800 per dollar in the space of just a few weeks in September and October of 1997, made it more expensive for Korea to pay for imports and most importantly made it nearly impossible for Korea to pay off foreign debt. Faced with national bankruptcy and a shortage of foreign capital with which to pay these loans, the Korean government accepted a bailout plan from the International Monetary Fund (IMF). This plan provided Korea with about $57 billion dollars to cover its financial commitments.

Even though the bailout was a lifeline to Korea, the plan was not greeted enthusiastically there. The period of the crisis began to be known in public discussions and conversations as the IMF *shi-dae*, or "IMF Era." The phrase should not be seen as a specific space in time with a well-defined endpoint, but a period and process of structural change to the economy and society, this change being demanded by the conditions of the bailout package. During this period, conversations on the streets of Seoul often began with the phrase IMF *ddaemunae*, or "because of the IMF..." followed by an observation

on how difficult situations had become. Public opinion saw the bailout as another

attempt at either Western or American economic hegemony. National pride coupled with

fears of financial strain led to a variety of domestic efforts to help bailout the economy,

including austerity campaigns, citizens collecting gold to contribute to national coffers,

and the eschewing of expensive foreign products.

One reason for the antagonism towards the bailout was the structural changes

required of the Korean business and banking sectors. These dictates of the IMF had

consequences not only for the economic sphere but society as well. A rationalization of

banking and business was called for under the requirements of the funding. The power of

labor unions was reduced. Also subject to cuts and change was the Korean employment

system, from one characterized by stability for salaried white collar workers to one

characterized by greater flexibility which also carries with it the meanings of job changes

and more part time and temporary workers. These changes were seen in the corporate

restructuring of the *chaebol*. Many *chaebol* were required to reconfigure to a more

"leaner and more profit-making" (Park 1999) organization through mergers and the

selling off of unprofitable and unproductive units. It is noted that at end of the day, it was

the average citizen who was hurt the most by the crisis; increases to the unemployment

rate was accompanied by hundreds of thousands of college students, who in the Spring of

1998 would join the ranks of the unemployed (Park 1999). Korea observers noted that it

was the common people who had to shoulder the burden of adjustment during the crisis

and recovery period, "long accustomed to a lifestyle of spending beyond their means,

South Koreans were to take bitter pills of structural adjustment, whose side effects would

include high unemployment, high taxes and interest rates, and overall belt-tightening"

(Park 1998: 3). Reviewing the year following the crisis, one pundit describe 1998 as

"pain and struggle" as a $10,000 per capita gross national product dropped to about

$6500, unemployment reached 10%, factories ran at just over half capacity, and economic growth decreased by 6% (Park 1999: 133).

Sociologists and criminologists have long noted the relationship between macro-economic conditions and violence. It is a natural question then to ask how the economic changes in Korea were related to interpersonal violence. Theories suggest that personal violence might increase as society lurches forward during modernization and development, as a booming economy pulls at the traditional social fabrics and connections which hold people together (Durkheim 1897/1979). Arguments also posit causal connections between economic busts and violence, as economic disadvantage and structural strain lead to social disorganization and deprivation (Merton 1938). More recently, scholars have inquired about the ability of social institutions to resist the violence-inducing pressures from the economic sphere (Messner and Rosenfeld 1997, 2007). Having experienced both boom and bust, Korea is an ideal case to explore these theories. Further, by juxtaposing an analysis of Korea side-by-side with analyses from a group of similar East Asian nations and with nations from a cross-national sample, the veracity of analytical findings can be better assessed.

CHAPTER III
THEORIES OF THE ECONOMY AND VIOLENCE

Economic stress is one of the most stable predictors of violence and disorder in cross-national and comparative criminology (LaFree 1999; Pratt and Cullen 2005) and macro-economic theories generally posit a negative link between various indicators of economic strain and pressure outcomes of crime and violence. But while macro-economic theories are especially applicable to periods of economic crisis, to account for any effects of rapid of economic growth on levels of violence the theories should also specify a positive linkage between the economy and violence. Accordingly, this study will use elements from Durkheim's theory of modernization to explain how economic growth might create levels of violence, and it will take from Merton's theory of anomie to explain how economic crisis might be responsible for increases in violence.

This study is also concerned how non-economic institutions might have ameliorated any economic stresses. Therefore, Messner and Rosenfeld's theory of Intuitional Anomie (IAT) will be used to identify important institutions for inclusion in analytical models. The next section will review these each theory, will identify key concepts, and conclude by proposing hypotheses for each theory.

Durkheim and Modernization

Emile Durkheim's theory on deviant behavior uses a conceptualization of anomie to link increases in troubling behavior, such as homicide and suicide, to decreases in social integration and social regulation. He located the sources of anomie in key elements of modernization- such as increases in individualism and the industrial transformation of society from a pre-industrial to industrial forms (1893/1997). Some versions of the theory maintain that increases in violence are inherent to social development, (Messner 1982: 226; see Webb 1972). This modernization thesis suggests that crime will increase

as modern values and norms come into contract with older systems of tradition and patterns of behavior (Clinard and Abbott 1973; Shelley 1981).

Durkheim specifically argued that in developing societies higher levels of deviance are linked to two factors, increases in egoism and a loss of social regulation. These two concepts share the same social cause, the absence of society in the individual (Durkheim 1897/1979: 258). The rise of egoism (and the attendant attenuation of its converse, moral individualism) comes about through the rise of the individual. The loss of social regulation comes about through material changes as industrialization and structural demographic shifts undermine previous forms of group solidarity.

A second link between economic change and violence might operate through threats to the collective conscience of society (Pridemore and Kim 2006). The collective consciousness is the "totality of beliefs and sentiment common to the average members of society" (Durkheim 1893/1997: 38-39). Thus sentiments about religion, the family, work and the state can form the basis of these "cherished beliefs" (Durkheim 1893/1997); these objects need not be tangible, but can also be symbolic or cultural (see also Pridemore and Kim 2006).

Societal development through economic transformation can weaken this common consciousness. The common consciousness becomes attenuated as the sentiments towards collective things are replaced by sentiments taking the individual as an object (Durkheim 1897/1979). Durkheim links this attenuation to violence through the idea of threat- the more rapidly that collective sentiments are challenged, the greater the feeling of threat. Society views these threats as "offensive", thus "the intensity of collective states of conscience raises the general level of the life of the passions…where family spirit has retained its ancient strength, offences against the family are regarded as sacrilege which cannot be too cruelly avenged…where religions faith is very intense, it often inspires murders and this is also true of political faith" (Durkheim 1897/1979: 356).

In this case, the strength of the passions generated by attachments to the objects of collective sentiments contributes directly to the strain felt when that object is removed or threatened. Current research, examining nations undergoing rapid economic and structural change, provides evidence on this proposition. Some evidence is supportive of the notion. For example, Karstedt's (2003) finds that nations with stronger collectivistic norms had higher homicide rates than those with individualistic norms during modernization and development. Pridemore and Kim (2006) found the swift democratization of Russia was associated with higher rates of violence.

Stamatel (2009) found contrary evidence when the transition of East-Central European nations was considered; in those nations higher degrees of economic change, during the post-communist transformation of these nations, was associated with lower levels of violence. Clearly more research is needed to explore the modernization hypothesis.

Durkheim's theory of modernization and social integration proposes that increases in crime and violence will accompany economic growth and development insofar as this development social integration and fosters conditions of anomie. Accordingly, the first hypothesis of this study states *violence will be positively related to economic development.*

Merton's Anomie Theory

Robert Merton's theory of anomie retains the core assumption of strain and frustration approaches to crime and violence. However, this theory is clearly a macro-sociological approach, emphasizing that the sources of strain in the individual are to be found in the organization of society. It is the specific ways in which society is structured that triggers the individual strains that produce crime (Williams and McShane 1994). For Merton's theory, this pressure towards crime is supplied by the condition of anomie.

Anomie is defined as a lack of articulation between the fundamental components of social organization – culture and social structure. When culture and structure are mal-integrated or unbalanced, crime and deviant behaviors are the expected outcome.   An understanding of Merton's anomie theory requires a discussion of both culture and social structure.

For Merton, the concept of culture contains two sub-components. The first component is the central value and goal system of society. Goals and values are "frames of aspirational reference" (Merton 1938) providing not only prestige and sentiment to the individual but also an important framework for group living. Importantly, anomie theory assumes the universal distribution of these goals across society. The second component of culture is the culturally legitimized means for achieving the aforementioned goals. Merton called this component the "regulatory norms and moral imperatives" (1938: 672) that while not necessarily the most efficient methods of achieving cultural goals, were nevertheless the approved and oftentimes institutionalized methods for attainment.   In anomie theory, individual success is defined as both an end as well a process as people seek culturally legitimate goals through culturally legitimate means.

The second component of the theory is the social structural element. Merton located this element in the system of social and economic stratification. The stratification system distributed the access to the legitimate means for the attainment of culturally defined goals. Thus, education, financial resources, network relationships, are some of the resources required to attain culturally defined goals of success. However, these resources are not equally distributed across society, as Merton noted: "legitimate effort is limited by the fact that actual advance toward desired success-symbols through conventional channels is, despite our persisting open-class ideology, relatively rare and difficult for those handicapped by little formal education and few economic resources" (1938: 679).

To be fair, Merton's theory has been criticized because as it stands, it predicts crime will result from a lack of resources rather than a surplus, thus over-determining lower-class crime (see Kornhauser 1978). However, as Messner and Rosenfeld (2007) note, Merton's notion of stratification and the universal longing for success goals can be applied within all levels of the class structure.   Passas (1990, 1997) showed that the cultural and structural mechanisms of anomie theory worked to explain upper-class crime and corporate deviance.

Others point to Merton's interchangeable use of the terms class, status, and stratum as a sign that his theory is not class biased (Menard 1995). It is not clear whether these terms refer to the specific socioeconomic stratification system of society as a whole- or a more generic hierarchical system where resources were differentially distributed. The theory allows for the effects of anomie to be felt not only between large-scale stratification groupings such as social classes, but also within these groupings as members compare themselves vis-à-vis their material counterparts.

The link between structure to anomie and finally to violence operates through individual level processes. While these individual level factors are beyond the scope of this analysis, it is worthwhile noting them. At the most general level, anomic conditions can be linked to crime and violence within individuals insofar as structural economic stress creates noxious stimuli, emotions, and renders valued goals unobtainable or even removes them.[4]

Merton hypothesized several other patterns of criminal behavior resulting from anomic social conditions. The first pattered response to the anomic conditions is innovation. Merton defined innovation as the "use of conventionally proscribed but

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[4] This is of course the main proposition of Agnew's General Strain Theory of crime. For a more detailed discussion on the micro-level theory of individual strain and crime, see Agnew (1992; 1999; 2001; 2008).

frequently effective means of attaining at least the simulacrum of culturally defined success— wealth, power, and the like" (1938: 678) Thus, in the face of a lack of legitimate resources for goal-attainment, innovators can be expected to use criminal methods in their place.

Describing innovation, Merton had in mind the striving for pecuniary and material goals. Some have theorized the appropriate outcome of anomie is in fact instrumental crimes of property and theft (Baumer and Gustafson 2007). In fact, Merton originally placed the anomic strain process within the context of the occupational structure and end-goals of wealth attainment, writing that "the limitation of opportunity to unskilled labor and the resultant low income cannot compete in terms of conventional standards of achievement with the high income from organized vice" (1938: 678-679).

However, Merton was clear that his theory was one of deviant behavior in general, not just to crime or delinquency. The theory was not restricted to the explanation of instrumental crime but also explained "rational, nonrational, or irrational" responses to anomie including crimes of violence (Merton 1968: 235; Menard 1995).

A second patterned response predicted by the theory is retreatism. The retreatist responds to anomie by rejecting both the goals and means of the wider culture. Merton suggested "vagabonds, tramps, chronic drunkards, and drug addicts" (Merton 1938: 677) had rejected both the culturally prescribed goals of society as well as any legitimate means to acquire these goals. As a result, these persons withdrew from society- or as Merton put it, they were "in the society but not of it" (1938: 677). Contemporary research has included suicide in the patterned response of retreatism, justifying this behavior as a case of acute retreatism (Baller, Levchak, and Schultz 2010).

Does economic change produce crime? In Merton's theory there is no necessary relationship between economic change and crime. Instead, crime is a normal outcome from a mal-integrated social system. In an anomic system where goals and opportunities

are disorganized, Cloward and Ohlin (1960) note that the theory directs researchers to find the causes of crime in "everyday processes". But, they also note that situations of economic crisis or sharp change are not ruled out as being inconsequential for Merton's theory. Instead, these structural conditions are "special instances affecting the relationship between aspirations and opportunity" (1960: 83).

In summary, Merton's anomie theory argues for a negative relationship between the economy and violence; poor economic conditions create hardships associated with inequality, poverty, and unemployment. In turn, these structural hardships create an anomic social system and increases in violence through an inability of normative standards to regulate behavior. This proposition is captured in the second hypothesis of this study; *violence will be negatively related to economic conditions.*

<div align="center">Institutional Anomie Theory</div>

So far the proposed theoretical frameworks have left unanswered the question of any factors intervening between economic change and levels of violence. Thus, a natural question to ask is whether social institutions can buffer the effects of economic change on crime and violence? Opening the door for these factors also forces the question on the forms by which these factors intervene in the economy-violence relationship.

Messner and Rosenfeld's Institutional Anomie Theory (IAT) (1997; 2007) is a macro-level theory describing the relationships between various social institutions and the impact of these institutional relationships on crime and violence. The theory retains some of the assumptions from the strain and anomie perspectives, but it also brings with it a unique perspective on the larger social organization. The major statement of the theory, that levels of crime and violence are directly related to the level of institutional imbalance in the social organization has been verified to some extent by researchers since the theory was first presented- about two decades ago.

Based in part on Merton's anomie theory, IAT retains that Merton's notions of social organization composed of the prevailing social structure and prevailing cultural values. The structural component of social organization refers to composition and arrangements of the various institutions of society, the polity, and the economy. This conceptualization draws in part from the ideas of Talcott Parsons on the unity of the social structure (Messner and Rosenfeld 2007). The cultural component of social organization refers to the values created and maintained by institutions of society and the economy. The cultural component not only includes the values of institutions- but also the interplay of values between institutions.

IAT, like Merton's anomie theory, also locates the root of crime and violence in anomic social conditions. IAT locates the source of anomie in the relationships between the various institutions of society and the economy. When there is an imbalance between the economy and other institutions of social organization, IAT suggests that high rates of crime and violence will follow. A brief discussion of the IAT understanding of cultural values and weak structural institutions will explain the link between economic imbalance and violence.

<div align="center">Values</div>

IAT proposes that high levels of violence are expected in society when the institutions are imbalanced. The key source of this institutional imbalance is the dominance of economic values over the values generated and maintained by other institutions. Why might economic values engender crime or deviant behavior? Some have emphasized how capitalist economic values might be associated with higher levels of these through an emphasis on efficiency norms over other moral considerations. Savolainen (2000) argues that in highly capitalist economies the mood of society is more predatory. This sentiment is also found in the work of earlier sociologists taking Marxist

and critical approaches. Bonger (1969), for example, noted that capitalism was accompanied by high degrees of egoism, which he related to crime. Capitalism gave rise to egoism primarily through the mechanism of exchange. Production for exchange led to the creation of surpluses. Whereas surplus could be altruistically distributed among those in need of it, in highly capitalist systems these surpluses were now held for later deployment in the market. In addition to creating egoism vis-à-vis those unable to produce for their own, capitalism engendered egoism as both parties in capitalistic exchanges try to get as much profit as is possible, to the disadvantage of the other. In in an unbalanced system the institutions of socialization and control are unable to provide restraints from criminal activity. These institutions are also unable to provide normative values inhibiting crime and creating social order.

How do economic values replace the values of other institutions and also weaken the norm-generating functions of other social institutions? Messner and Rosenfeld outlined a process called *domination* whereby economic values came to devalue, accommodate, and penetrate the larger social organization. First, non-economic institutions and functions become devalued. As an example, educational values of knowledge for knowledge's sake, or the role of the humanities in higher education have been devalued in the face of the economic value of a degree, or because of arguments on the practical applicability of a degree "to the real world." Second, non-economic values must accommodate economic values, as when time spent with the family is sacrificed for work commitments or when educational responsibilities of the student take second seat to the requirements of part-time employment. Finally, economic values penetrate the non-economic institutions of the social organization. In the political sphere leadership is given short shrift and instead politicians are judged on managing the economy and job creation. Family roles now emphasize the "breadwinner" over the role of parent. Within

educational institutions students earn grades and participate in extracurricular activities for perceived benefits in college admissions.

<div align="center">Counterbalancing: Social and Political Institutions</div>

Messner and Rosenfeld did not assume the relationships among the various institutions of the social organization were static; institutional power ebbed back and forth. Specifically, social institutions such as the family and political institutions could counterbalance the dominance of economic values. This leads to an important proposition of the theory- when institutions of the family and the state are strong (vis-à-vis the economy)- then lower levels of crime and violence are expected as these institutions can stave off anomic values and instead help foster forms of social control and decommodification.

As for the role of the family in ameliorating anomic pressures from the economic sphere, IAT acknowledges the restraining and protective role of social bonds (Hirschi 1969). Here the theory allows for both inner and external sources of control (Reckless 1961). Inner controls derive from socialization and represent the "normative control associated with culture" (Messner and Rosenfeld 2007: 86). A high degree of anomie is associated with low inner controls as individuals are freed to pursue goals by means which are as expedient as possible (Messner and Rosenfeld 2007). External controls reflect the commitment and involvement aspects of the social bond. These controls derive from "active involvement of individuals in institutional roles and through the dispensation of rewards and punishments by institutions" (Messner and Rosenfeld 2007: 86).

IAT also acknowledges the family can create and maintain protective bonds of control over individuals (Hirschi 1969; Kornhauser 1978). Messner and Rosenfeld note that: "The institution of the family bears primary responsibility for the regulation of

sexual activity and for the replacement of members of society. These tasks involve establishing and enforcing limits of legitimate sexual relations among adults, the physical care and nurturing of children, and the socialization of children into the values, goals, and beliefs of the dominant culture" (2007: 72).

In addition to providing values and control, Messner and Rosenfeld note the family is also a source of social support. In criminological theory social support is perceived as actual instrumental or expressive support provided by intimate ties or formal institutions (Cullen 1994). Social support is inversely related with levels of crime and violence. Ideally, families provide solace from tensions and stresses of public life and the responsibilities and requirements of the other institutional domains.

The family is not the only institution which can protect against the domination of economic values. The notion that the state is able to protect society from the dominance of the economy has long been noted in the political economy literature (see Polanyi 1944/1957). Messner and Rosenfeld adopt this idea and argue the state can use policy tools to protect citizens from the vicissitudes of market dynamics. When the state can protect citizens from market dynamics, other institutions such as the family have more resources available for their norm creation and norm maintenance functions.

Most research in IAT has adopted the concept of labor decommodification as an indicator of state counterbalancing efforts (Messner and Rosenfeld 1997; Savolainen 2000). Decommodification is the extent to which the state uses policy interventions in the labor market to protect citizens from cyclical crises of oversupply and unemployment in business cycles (Esping-Anderson 1990; Schumpeter 1942/1976). A common indicator of decommodification effort has been indices of national social security spending. However, it has been difficult to gather a comparable measure across a wide range of nations.

To address the issue of comparability and also expand the theory, recent empirical research in IAT has expanded the scope of state counterbalancing to cover more policy domains; policy tools argued to be effective indicators of state counterbalancing include state efforts in public education (Bjerregaard and Cochran 2008) and state spending on public health (Pratt and Godsey 2002, 2003). The notion of state policy intervention as a buffer against pressures towards crime and disorder is also in accord with the notions of general social support (Cullen 1994; Pratt and Godsey 2002, 2003).

In short, institutional anomie is linked to crime or deviant behavior in two ways. First, economic values replace normative values generated and maintained by non-economic institutions. A long line of theorizing proposed a link between the extreme dominance of economic values and crime. Second, norm-creating institutions lose their ability to provide regulative social controls and social support. When economic institutions dominate the social structure- high levels of violence are expected. When non-economic institutions are strong lower levels of crime and violence are expected.

Among scholars in the IAT tradition, there is some debate on how to specify the relationships between institutional context, the economy, and violence. Early research (Messner and Rosenfeld 1997) originally specified an indirect or mediated effect as the dominance of the economy fostered weak institutional controls (Messner and Rosenfeld 2007). However later research argued for a moderational approach (Savolainen 2000; Bjerregaard and Cochran 2008) justifying an interaction approach by citing from the original theory; as Messner and Rosenfeld wrote, "Institutional-anomie theory… (directs) attention to aspects of the economic organization of market societies beyond the stratification system, and to the interplay of the economy and other social institutions" (1997: 1408). The most recent research admits that even though there is support for both mediating and moderating effects, with the majority of the research supporting the latter, the issue is still not completely settled (Bjerregaard and Cochran 2008). Accordingly

this study will specify two additional hypotheses: *non-economic institutions will mediate any relationship between the economy and violence* and *non-economic institutions will moderate any relationship between the economy and violence.*

CHAPTER IV
DATA AND METHODS
<u>Data</u>

Because of the tremendous economic growth and subsequent acute economic crisis, it was decided to analyze economic structure and violence in South Korea. The selection of South Korea allows for an in-depth examination of the relationship among these variables over the long term, about 20 years. This time span allows for the use to a variety of time-series analytical techniques in addition to more standard regression modeling.

Variables

Violence in Korea was measured using suicide and homicide rates. This data was taken from the World Health Organization (WHO) mortality dataset. Contemporary research on suicide and homicide acknowledges the WHO figures are the most valid source of international statistics (LaFree 1999). Both suicide and homicide were measured as the number of incidents per 100,000 of the total population.

The economic context was indicated by gross domestic product per capita (GDP) in current (2010) prices. This data came from statistical sources maintained by the Organization for Economic Cooperation and Development (OECD).

For control variables, the size of elderly population was measured as the percentage of the total population 65 years or older. It is important to control for this population because of the strong association between elderly population size and suicide rates. The size of young male population was measured by the percentage of the total male population in Korea between the ages of 15-34. It is important to control for this population because of the strong association between young male population size and crime rates. Both demographic variables were taken from the WHO Mortality dataset.

The degree of income inequality in Korea was captured using the SWIID GINI coefficient (Solt 2009).[5]   It is important to control for income inequality because it is one more source of structural economic strain which can be associated with high rates of violence. Inequality is a statistic ranging from 0 to 100 with a value of 0 representing absolute equality and 100 being absolute inequality.

The strength of the family was measured by divorce rates, the total number of divorces granted each year divided by the total population (in thousands) for that year. This variable was taken from various editions of *Statistics Korea Annual.* The strength of state institutional balancing was indicated by state public health spending. This variable was created by dividing the total government spending on health by total government spending. These figures were obtained directly from the Korean Health and Welfare Ministry and through the Korean Statistical Information Service (KOSIS).

Descriptive Statistics

Table A1 presents correlations, means, and standard deviations for all variables in the national sample. The mean suicide rate was about 13.159 per 100,000 of the population. By year, the highest suicide rate occurred in 2005 when there were 24.75 suicides per 100,000 of the population. The lowest level of suicides was in 1988 when there were 7.02 suicides per 100,000 of the population. The mean homicide rate was about 1.57 per 100,000 of the population. By year, the highest homicide rate was in 1997 when there were 2.12 suicides per 100,000 of the population. The lowest level of homicides was in 1985 when there were 0.98 homicides per 100,000 of the population.

The correlations statistics in Table A1 show the simple relationships between suicide, homicide, and the economy as well as the substantively interesting variables of

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[5] The Standardized World Income Inequality Database (SWIID) GINI coefficient provides a time-varying indicator of inequality for the period under consideration

balancing and control. Inferences from the bivariate relationships are limited for several reasons. First, the effects of other variables cannot be simultaneously considered. Second, bivariate correlations do not allow for causal ordering nor do these correlations take into account the time-dependent character of the data. Third, unique national sources of variation might be present in the data and bivariate correlations cannot account for this.

<div align="center">Regional Data</div>

The regional analysis considered the set of hypotheses across a group of Asian nations over the course of 10 years. The decision to include these specific Asian nations in the analysis rested on two main points. First, I sought to include a set of nations which had some degree of variation between them with regard to both economic crisis and economic growth.

Second, the issue of data availability determined which Asian nations to include in this study. In the regional analysis, specific national-level statistical agencies and data holders were consulted with in order to gain data. Drawing from different data sources required that careful attention be paid to the consistency of variable operationalizations. Table A2 presents the list of nations included in the regional analysis.

<u>Variables</u>

Violence was measured using suicide and homicide rates. With some exceptions, these figures were taken from the WHO Mortality dataset. Taiwanese suicide figures were obtained directly from the Taiwanese Executive Yuan, Department of Health. Taiwanese homicide figures were obtained directly from the Taiwanese National Police Agency. Thai suicide figures were obtained directly from the Thailand Health Information Unit, Bureau of Health Policy and Strategy. Thai homicide figures for 2001-2004 were obtained directly from the Royal Thai Police Department and the Thai

National Statistical Office. Both suicide and homicide were measured as the number of incidents per 100,000 of the total population.[6]

The wealth of the nation was indicated by the GDP per capita at current (2010) prices. With the exception of Taiwan, this data came from World Bank statistical sources. Taiwanese GDP data was obtained directly from the Taiwanese National Statistical Agency.

Elderly population measured the percentage of the total population in a nation which is 65 years or older. With the exception of Taiwanese data, these figures came from the WHO Mortality dataset. The data for percentage of elderly in Taiwan came directly from the Taiwanese Ministry of Interior, Department of Household Registration Affairs. Crime-prone population was measured by the percentage of young males, between the ages of 15 and 34, in the total population. With the exception of Taiwanese data, these figures came from the WHO Mortality dataset. The data for percentage of elderly in Taiwan came directly from the Taiwanese Ministry of Interior, Department of Household Registration Affairs.

Income inequality in each nation was measured by a GINI coefficient. Because of limitations in the availability of the commonly-used World Bank and UN HDR GINI figures (see Pratt and Cullen 2004), the SWIID GINI coefficient was used (Solt 2009).

Family structure in each nation was measured by the total number of divorces granted each year divided by the total population (in thousands) for that year. With certain exceptions, this variable comes from the UN Demographic Yearbook. Taiwanese divorce figures were obtained directly from the Taiwanese Ministry of Interior, Department of Household Registration Affairs. Thai divorce figures were

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[6] The suicide and homicide variation between the nations in the regional sample was small enough that these rates were constructed with the denominator of 100,000 of the population, rather than the 1000 of the population used in the cross-national sample.

obtained directly from the Thai Statistical Forecasting Bureau, National Statistical Office of Thailand.

Public health spending figures were used to measure the degree *of state institutional balancing* in each nation. This variable was created by dividing the total government spending on health by the total GDP. With some exceptions, these figures were taken from the World Bank World Development Report (WDR). Taiwanese figures for government health spending were obtained directly from the Taiwanese Bureau of Statistics, Social Statistics Division. For Thailand, these figures were taken from the Governmental Budget & Settlement, Bureau of National Health Insurance.

Descriptive Statistics

Table A3 presents correlations, means, and standard deviations for all variables in the regional sample in their level forms. Referring to the table, the mean suicide rate was about 13.439 per 100,000 of the population. By nation, Japan had the highest average suicide rate, about 22.49 suicides per 100,000 of the population, and Thailand had the lowest, about 7.68 per 100,000 of the population. The mean homicide rate was 3.2 per 100,000 of the population. By nation, Thailand had the highest average homicide rate, about 6.20 homicides per 100,000 of the population, and Japan had the lowest, about 0.58 per 100,000 of the population.

Table A3 presents the means, standard deviations, and correlations for the regional sample in differenced form. The same caveats for time-dependent data which applied to the national data in Table A1 apply to the time series data from East Asian nations.

Cross-National Data

The cross-national analysis included 50 nations in the full dataset measured in the year 2000. This number is in line with sample sizes in cross-national research on crime

and violence (see Messner and Rosenfeld 1997; Pratt and Godsey 2003, 2002; Savolainen 2000). The major limiting factor prohibiting a sample which approximates the full set of nations (about 200) is data availability. Table A4 presents the list of nations (n = 50) included in the analysis.

Variables

Violence was measured using suicide and homicide rates. With one exception, this data was taken from the World Health Organization (WHO) mortality dataset. Taiwanese suicide figures were obtained directly from the Taiwanese Executive Yuan, Department of Health. Taiwanese homicide figures were obtained directly from the Taiwanese National Police Agency. Both suicide and homicide were measured as a rate, the number of incidents per 100,000 of the total population.

The economy context was indicated by GDP at current (2010) prices. With the exception of Taiwan, these data came from the United Nations Human Development Report (HDR).[7] Taiwanese data for GDP at 2010 prices was obtained directly from the Taiwanese National Statistical Agency.

The elderly population was indicated by the percentage of the total population in a nation which is 65 years or older. With the exception of Taiwanese data, these figures came from the WHO Mortality dataset. The data for percentage of elderly in the Taiwanese population came directly from the Taiwanese Ministry of Interior, Department of Household Registration Affairs.

The crime-prone population was indicated by the percentage young males (between the ages 15 and 34) in the total population. With the exception of Taiwanese

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[7] GDP data for all samples were transformed using a standardized log-transformation procedure using the following equation: (LOG(GDP)-LOG(MINGDP))/(LOG(MAXGDP)-LOG(MINGDP)), where MINGDP and MAXGDP were minimum and maximum values from the respective samples.

data, this data came from the WHO Mortality dataset. The data for percentage of young

males in the Taiwanese population came directly from the Taiwanese Ministry of

Interior, Department of Household Registration Affairs.

The degree of income inequality in each nation was measured by the World Bank

GINI coefficient.

Family structure is indicated by the divorce rates in each nation, created by

dividing the total number of divorces granted each year by the total population (in

thousands) for that year. With one exception, this variable came from the UN

Demographic Yearbook. Taiwanese divorce figures for the year 2000 were obtained

directly from the Taiwanese Ministry of Interior, Department of Household Registration

Affairs.   Institutional balancing was indicated by state public health spending, this

variable was created by dividing the total government spending on health by the total

GDP. These figures were taken from the UN Human Development Report (HDR).

Descriptive Statistics

Table A5 presents the means, standard deviations, and correlations for the nations

included in the cross-national analysis. Discussing the analysis in the full sample, Table

3a shows that the mean homicide rate for all nations in the sample was 0.058 per 1000 of

the population. El Salvador had the highest homicide rate, about 0.360 per 1000 of the

population. Egypt had the lowest homicide rate, about 0.001 per 1000 of the population.

The mean rate of suicide for all nations in the sample was 0.143 per 1000 of the

population. Lithuania had the highest rate of suicide, about 0.449 per 1000 of the

population. Egypt had the lowest suicide rate, about 0.001 per 1000 of the population.

Methods

The next section describes the various regression models used for inferential

analyses in this study. First, I will present a description of the specific models and what

hypotheses they address. Second, I will discuss the regression models with regard to each level of analysis. I will pay attention to modeling issues between the standard ordinary least squares (OLS) regression framework and the more general regression models required by characteristics of the data.

<center>Model Overview</center>

Multiple Regression Models

Multiple regressions answer the question of how the independent variables of interest add to the prediction of the dependent variable after the effects of other independent variables are controlled for. In these equations each independent variable is assessed in terms of the unique contribution it makes to the overall variability of the dependent variable. This unique contribution is evaluated in terms of the main effect captured by the regression coefficient. A multiple regression containing GDP and control variables will be performed at each level of analysis in order to establish a baseline understanding for each level and to specifically answer the first hypothesis on the direction of the relationship between the economy and violence. Subsequent mediational and moderation models will then be built upon these baseline models.

Mediational Regression Models

Mediational multiple regressions answer questions of the logical ordering of the independent variables. They do so through an evaluation of how the effect of an independent variable X on the dependent variable Y changes with the inclusion of other meaningful variables into the model. Challenges posed by mediational analyses include the need for *a priori* theorization of the ordering among the sets of variables. Because mediational analyses allow for a rich description of the relationships among independent and dependent variables, another layer of complexity is added to the interpretation of the analyses. In this analysis the mediational multiple regressions will be used to evaluate the

second hypotheses on how the relationship between the economy and violence changes with the addition of non-economic institutions.

<u>Interactive Regression Models</u>

Interactive multiple regressions answer the question of how the relationship between two variables is moderated by a third variable. The use of an interaction analysis allows for the understanding of both conditional effects and moderated effects of key variables. Interactive effects are regression coefficients from a multiplicative term. This term is created by taking the product of a focal variable (the variable of which the effect on the dependent variable is thought to function according to) and a moderator variable (the variable of which levels of are thought to influence the strength of the relationship between the focal variable and the dependent variable (see Jaccard and Turrisi 2003). Conditional effects, the regression coefficient from the component term, reflect the influence of the focal variable on the dependent variable when the moderator variable is zero.

One benefit of interaction analyses is that they allow the researcher to understand the context of the relationship between variables. Oftentimes the influence of an important variable on outcomes might not be discernible through the main effects or from bivariate correlations alone. Challenges posed by interaction analyses include the need to theorize and specify the interaction terms *a priori*. In addition, interactive models require the researcher to adjust the variables somewhat in order to account for a high degree of interrelationship between independent variables (i.e. multicollinearity). In this analysis, the interactive multiple regressions will be used to evaluate the third hypothesis of the study, that is how any effects of the economy on violence change at different levels of non-economic institutions.

Multiple Regression Models

National Models

The national sample considers one unit followed over a period of approximately 20 years. Models that track a single unit over time are referred to as time-series designs. There are advantages and several disadvantages to time-series designs. Like all data containing a time dimension, single unit time-series have the advantage of allowing for temporal ordering of the data.

Time-series models also have issues which must be mitigated if correct inferences are to be made from the data. First, data might be autocorrelated. In the presence of serially correlated data, the OLS assumption of non-correlated disturbances is violated. In practice, serial correlation can result when the values of a variable at time t influence the values of the variable at time $t + 1$. The consequences of ignoring serial correlation in the data include underestimating the true variances and by implication arriving at incorrect confidence intervals and t-ratios (see Ostrom 1990).

The presence of serial correlation can be mitigated. Generalized least squares (GLS) methods provide a way to compensate for the correlated structure of the data. The most common way to employ GLS is to make an assumption that the data follows a first-order autoregressive process, or AR(1). These AR(1) processes assume the correlated structure of the disturbance terms operates in the temporal sequence from t to $t + 1$. Models with the AR(1) error structure include the following equation:

$$\upsilon_t = \rho \upsilon_{t-1} + \varepsilon_t \qquad\qquad [1]$$

where the coefficient ρ is the proportion of the disturbance, in the previous period, which affects the disturbance in the current period (see Gujarati 1995).

The second issue is heteroskedasticity. Therefore time-series statistical models will include an adjustment to the standard error in order to make it robust to heteroskedasticity. The standard error adjustment for the national level time series is

similar to White's heteroskedastic-consistent fix-up (StataCorp 2007). This robust standard error, however, is not robust to the misspecification of the functional form or to omitted variables.

All of the national time-series models will include a linear time trend. The inclusion of a time trend takes into account the effects of a number of non-measurable known or unknown factors on the dependent variables. The choice of a linear time trend, rather than an exponential or geometric trend, is based on an assumption on the characteristics of the effects. As these models seek to remove the effects of unmeasured variance, rather than to explore the relationship between time and the dependent variables, a linear time-trend is the most conservative estimate.

These models are estimated using the Prais-Winsten method of GLS. This method utilizes an AR(1) transformed regression estimator and allows for the inclusion of a robust standard error. An alternative process, the Cochrane-Orcutt technique, substitutes the AR(1) method with a lag process. The consequence of the alternative process is the loss of the first observation in the sample. This loss of course reduces degrees of freedom in the model. Thus, in small samples the Prais-Winsten method is preferred over the Cochrane-Orcutt technique (StataCorp 2007). The Prais-Winsten method has been used in previous research on crime trends and the social context of crime in South Korea (Joo and Yoon 2008).[8]

National Time-Series Models

To assess the direct effects of the economy on suicide and homicide at the national level, a set of multiple regressions will be performed. These models will consist of a baseline model consisting of control variables and the variables of economic

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[8] All national-level models were estimated using the PRAIS framework in STATA.

conditions. A second set of models will then add the variables of family structure and state balancing.

The national regressions are represented by the following equation:

$$Y_t = \beta 0 + \beta 1 X 1_t + \rho \upsilon_{t-1} + \varepsilon_t \qquad [2]$$

where Y_t is the vector for the dependent variable at time t, $\beta 0$ is the constant in the equation, and $\beta 1 X 1_t$ is the vector of independent variables each measured at time t. The term ρ is the AR(1) coefficient for the error term υ. This term is measured at time $t-1$.

National Time-Series Interactive Models

To assess the hypothesized moderating effect of key independent variables on the proposed relationship between economic and political change on personal violence, a set of *interactive multiple regressions* will be estimated. The procedure for the creation of the interaction term is identical to that undertaken to create the interaction term at the regional and cross-national levels.

The inclusion of this centered interaction term in national time series models yields the following equation for the analysis in level form:

$$Y_t = \beta 0 + \beta 1 X 1_t + \beta 2 X 2_t + \rho \upsilon_{t-1} + \varepsilon_t \qquad [3]$$

where Y_t is the vector for the dependent variable at time t, $\beta 0$ is the constant in the equation, and $\beta 1 X 1_t$ is a vector of centered covariates at time t. The interaction term $\beta 2 X 2_t$ is a vector of the multiplicative terms interaction terms at time t. The term ρ is the AR(1) coefficient for the error term υ which is measured at time $t-1$.

Regional Models

The second portion of the analysis will consider the effects of the economic and political change on violence in a subset of Asian nations. This sample considers 5 nations followed over a period of 10 years. Models that combine cross-sectional

observations over time are referred to as time-series cross-sectional designs (TSCS). There are several advantages to TSCS designs.

First, pooling data into a TSCS matrix allows for the analysis of variation across different units and across time (Sayrs 1989). Second, TSCS designs increase the number of data points, thereby increasing both the degrees of freedom in the analytical model as well as reducing collinearity among the independent variables. Third, the longitudinal character of the data allows for a better understanding of causal dynamics between the dependent and independent variables (Worrall and Pratt 2004). Finally, TSCS designs can account for time-stable characteristics of the unit which might affect independent variables but are still unobservable or non-measurable.

Despite the advantages which come with the use of longitudinal and panel data, the data also has special issues which must be accounted for. The use of multiple observations on a limited number of cases creates problems of heterogeneity among the cases.

Heterogeneity issues arise when the variance in the pool of data is non-constant (Sayrs 1989). The culprit behind non-constant variance lies behind the clustered nature of the data; it might not be reasonable to assume that all of the specific units, the nations, share the same variance. Heterogeneity can also result from the omission of unobserved variables which themselves remain constant over time (Worrall and Pratt 2004). Consequences of ignoring heterogeneity bias include inconsistent and meaningless parameter estimates.

Techniques are available to account for panel heterogeneity. Perhaps the simplest method is to use a set of unit-specific dummy variables in regression models (Worrall and Pratt 2004; Sayrs 1989). There are two criticisms of this practice, however. First, the inclusion of dummy variables decreases the degrees of freedom available in the models. Second, the practice of including dummy variables has been described as "crude" way to

model the data (Beck and Katz 1995). More specifically, the coefficients for the dummy variables are themselves not interpretable. Second, the dummy variable modeling approach might set up other unreasonable assumptions on the data. For example, even though the inclusion of a nation-specific indicator variable allows for each nation to have its own intercept term, the model assumes the slope of the regression line will be constant across nations. The use of these country-specific dummy variables to account for heterogeneity is also known as country-specific fixed-effects modeling.

In this analysis I acknowledge the shortcomings of the dummy variable method of modeling the data. I also point out that the approach is actually a conservative one in that the extent of heterogeneity in these nations is not known and this analysis is merely starting "at the beginning" (Worrall and Pratt 2004). In addition, any loss in efficiency created by the inclusion of N dummy variables is perhaps tempered by an increase in the conservative character of the model; any significant coefficients will have had a higher threshold to cross. Accordingly all models in the regional analysis will include dummy variables for nation. A practical consequence of including a set of N dummy variables is the elimination of the constant in the regression equation.

A second way to address panel-specific heterogeneity is to use a weighting variable for each cross-section. In cross sectional research unit heterogeneity might be an issue. Unit heterogeneity inheres when the units in question, in this case individual nations, might unduly influence regression estimates. One common way to mitigate this issue is to weigh the observations by some characteristic of the unit. In cross-national criminological research this is usually done by including the weight of the square root of the national population (Altheimer 2008; Pratt and Godsey 2003, 2002). Accordingly, models will include this weighting term.

A third way to address non-constant variance across panels is through the inclusion of a heteroskedastic error term. For generalized least squares (GLS) modeling,

robust error terms are created by allowing for panel-specific values in the diagonal of the matrix for the disturbance term (StataCorp 2007: 147). Accordingly, all regional models will contain this robust standard error.

Serial correlation is another issue to be aware of in the regional data. The definition and consequences of serial correlation in the regional context are exactly the same as those issues encountered in the national time-series analysis. In addition, the correction for serial correlation remains the same, that is the inclusion of an AR91) error process in the regression analyses.

Regional models for this analysis make another assumption on the data, namely that the value of ρ will be common across panels. This assumption maintains that time-dependent processes driving interpersonal violence are similar across national settings. Statistically, a common error structure is a reasonable restriction to make when the time series is short (StataCorp 2007: 150). Further, the assumption of a common AR coefficient is a conservative one and has been argued to be reasonable in the absence of theory or evidence which might suggest otherwise (Beck and Katz 1995).

TSCS designs also allow for the modeling of "time effects," that is year-to-year events which affect all units in the sample. These year-to-year events may be known or unknown. In addition, while they might be theorized, in practice they might be non-measureable. Without the inclusion of these effects, random variation over time could occlude any relationships in analytical models. The effect of time will be accounted for by including a dummy variable for year (Worrall and Pratt 2004). [9]

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[9] All regional TSCS models were estimated using the XTGLS framework in STATA.

Regional TSCS Models

To assess the direct effects of economic conditions on suicide and homicide at the regional level, *TSCS multiple regressions* will be performed. A baseline model will include control variables and the substantively interesting variables of economic condition. A second set of models will then add the variables of family structure and state balancing. TSCS regression models will allow the assessment of direct effects of economic conditions both with and without the potentially buffering variables in the model.

The regional TSCS regression is represented by the following equation:

$$Y_{it} = \beta 1 X 1_{it} + \rho \upsilon_{it\text{-}1} + \varepsilon_{it} + n_k \qquad [4]$$

where Y_{it} is the vector for the dependent variable for unit i at time t. The term $\beta 1 X 1_{it}$ is the vector of independent variables each measured at unit i and time t. The term ρ is the AR(1) coefficient for the error term υ. This term is measured at time $t\text{-}1$. This model includes a set of k nation-specific dummy variables. When k equals the number of units in the data, then there is no constant in the regression equation.

Regional TSCS Interactive Models

To assess the hypothesized moderating effect of key independent variables on the proposed relationship between economic and political change on personal violence at the regional level, a set of *TSCS interactive multiple regressions* will be estimated. The procedure for the creation of the interaction term is identical to that undertaken to create the interaction term at the national levels.

The inclusion of this interaction term in regional TSCS models yields the following equation for the analysis:

$$Y_{it} = \beta 1 X 1_{it} + \beta 1 X 2_{it} + \rho \upsilon_{it\text{-}1} + \varepsilon_{it} + n_k \qquad [5]$$

where Y_{it} is the vector for the dependent variable at unit i for time t. The term $\beta 1 X1_{it}$ is a vector of covariates at unit i for time t. The interaction term $\beta 1 X2_{it}$ is a vector of the multiplicative terms at unit i for time t. The term ρ is the AR(1) coefficient for the error term υ which is measured at time t-1. The term n_k is the vector of k nation-specific dummy variables. With the inclusion of these dummy variables there is no constant in the regression equation.

Cross-National Models

The cross-national portion of the analysis will consider the effects of the economic conditions on violence in a sample of 50 nations measured at the year 2000. The following section will describe the specific features of the regression models as these models apply to the cross-national sample.

Cross-National Regression Models

To assess the direct effects of both economic conditions on suicide and homicide, a set of *multiple regressions* will be performed. These regressions will consist of a baseline model with control variables and variables of economic conditions included in the model. A second set of models will include the substantively interesting variables of family structure and social state balancing. These models will allow the assessment of the direct effects of economic and political change with and without influential variables in the model.

The regressions in are represented by the following equation:

$$Y = \beta 0 + \beta X1 + \varepsilon \qquad\qquad [6]$$

where Y is the vector for the dependent variable, $\beta 0$ is the constant in the equation, $\beta X1$ is the vector of independent variables, and ε is the error term. The coefficients for these simultaneous regressions in level form are estimated using ordinary least squares (OLS) methods.

In cross sectional research unit heterogeneity might be an issue. To address heterogeneity I will use a weighting variable for each cross-section. This practice is identical to that in the regional analyses research. Accordingly, all cross-national models will include a weighting factor which is the square root of the nation's population.

Cross-National Interactive Models

To assess the hypothesized moderating effect of key independent variables on the proposed relationship between economic and political change on personal violence, a set of *interactive models* were estimated.

The interactive product terms will be created following the same procedure as in the national and regional analyses. The cross-national interactive regression is represented by the following equation:

$$Y = \beta 0 + \beta 1 X1 + \beta 2 X2 + \varepsilon \qquad [7]$$

where Y is the vector for the dependent variable, β0 is the constant in the equation, and βX1 is the vector of independent variables, and ε is the error term. Equation [7] differs from the baseline regression models because of the inclusion of the vector of interaction terms, β2X2. The coefficients for these simultaneous regressions in level form are estimated using OLS methods.

CHAPTER V
KOREAN ANALYSIS
Bivariate Trends

The time-series character of the Korean data lends itself to a visual inspection and comparison of independent and dependent variables. While these bivariate relationships are limited in their ability to supply any causal inferences they nevertheless can point to associations which might later be uncovered or clarified in the multivariate modeling framework. In addition, by presenting bivariate relationships between independent variables and both suicide and homicide rates in Korea, we can begin to contextualize these variables in the Korean case and highlight particular aspects of Korean society and the Korean economy.

In order to make the bivariate comparisons between variables measured on different scales, the data were transformed into standardized scores, z-scores. A standardized score for each year was created by subtracting the original score from the mean of the series for that variable and then dividing this number by the standard deviation of the series. A standardized score of zero indicates a value at the mean for that series; a positive score indicates a value above the mean and a negative score a value below the mean. Transformation of a raw score into a standardized score does not alter any trends contained within the original metric.[10]

Figure A1 shows the trends between the Korean GDP and suicide rates over the period of the study. GDP did not show nearly as much variation as suicide rates did. Suicide rates showed a slight dip and flattening from the late 1980s until the early 1990s. During the 1990s suicide rates began a gradual climb with a sharp jump between 1997 and 1998, the financial crisis years. During this time, the GDP dropped as well.

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[10] For a similar application of this methodology to the case of crime in Japan, see Aranha and Burruss (2010).

Following the crisis, suicide rates dropped while the economy gradually increased. However, the decrease in suicide rates was only temporary; by the early 2000s suicide again began to climb. During this post-crisis period, suicide showed increases while economy also grew. However, during the crisis years there was a clear inverse relationship between GDP and suicide. These two trends suggest a complicated relationship between the economy and suicide in Korea. During some periods economic growth was associated with increases in suicide, while acute economic crisis also increased suicide.

Figure A2 shows the trends between the Korean GDP and homicide rates over the period of the study. Overall, there was a great deal of variability in homicide rates during this period. However, up until the crisis years there appeared to be a general increase in homicide trends alongside economic growth. The steepest and most sustained increase in homicides actually occurred for several years prior to the 1997 crisis; following the crisis homicides decreased and the trend line lost its clear positive slope. At the most tentative level during the pre-crisis years there was a corresponding increase in homicide and the economy, but this trend did not continue into the recovery period.

Figure A3 shows the trend between the Korean elderly population size and suicide rates. With the exception of an inverse relationship, which disappeared by the 1990s, suicide and elderly population sized both increased over the period of this study. This bivariate relationship accords with the existing knowledge on the relationship between population distributions and suicide.

Figure A4 shows the trend between the Korean population of young males and homicide rates. From these trend lines there appears to be no clear relationship between the two. There was a general decline in the young male population over this period, perhaps reflecting the larger decline in Korean fertility rates over the course of

industrialization. Fertility rates have also declined as a result of government family planning efforts (Park and Cho 1995).

Figure A5 presents the trends between Korean economic inequality and suicide. Immediately apparent is the high degree of variation in economic inequality during this period. During the 1980s and the early to mid-1990s there was a general inverse relationship between inequality and suicide. In the post-crisis year of 1998 there was a jump in both inequality and suicides, though during these post crisis years inequality had a high degree of variation so it is difficult to say if the 1998 increase seen in both was due to any specific relationship or was just spurious. Finally, during the 2000s a general inverse trend in both series appeared once again.

Figure A6 shows the trends between inequality and homicide. It is difficult to discern any clear-cut relationships between the two. However, both trends showed a general increase, leading up to at least the mid-1990s, followed by a general decrease up until around 2005.

Figure A7 shows the trend between Korean divorce rates and suicide. The trends between divorce and suicide suggest a positive relationship between the two. Suicide increased from 7.36 incidents per hundred thousand in 1990 to 22.63 incidents per hundred thousand in 2003; divorce increased from 1.1 per thousand of the population in 1990 to 3 per thousand in 2003. While there was some variability in the relationship between the two trend lines in the immediate post-crisis years, the overall trend suggests a strong positive relationship between the divorce and suicide.

Figure A8 shows the trend between divorce and homicide. The trend lines suggest only a very tenuous and general positive relationship between homicide and divorce, during the pre-crisis years. However, during the post crisis years this general trend disappears.

Figure A9 presents the trends between Korean public health spending and suicide rates. The trends of both suggest an inverse relationship. Between 1985 and 1991 public health spending increased from 2.69 to about 4.66 percent total government spending. During the same time period, suicide rates decreased from 9.12 to 7.09. Between 1993 and 1998 public health spending began to decline from 4.35 to 4.12 while suicide began to increase from 9.36 to 18.29. While the negative relationship persisted somewhat into the post-crisis years, up to around 2000, the overall relationship between public health and suicide became much more complicated during this period.

Figure A10 presents the trends between public health spending and homicide. The relationship between these variables is not so clear cut. However, there are signs suggesting a negative relationship. In the early to late 1990s public health spending decreased, or held steady, from 4.62 to 4.12 while during the same time period homicide increased from 1.28 to 2.11 per hundred thousand. Following the crisis, public health spending began to increase from 5.98 to 7.72, between 1998 and 2004, while homicide dropped to 1.67 in 1999 and reached a low of 1.59, in 2001, before beginning to slowly increase again.

<u>Multivariate Time Series</u>
Suicide in Korea

Table A6 presents the results of the regression analyses predicting suicide in Korea between 1985 and 2006. Each table presents seven models; the first model examines the direct effects of GDP and control variables on the measures of violence, establishing a baseline. The second, third, and fourth models add measures of family strength and institutional balancing in order to examine any mediating effects. The last three models include interaction terms between the economy and family and the economy and institutional balancing, in order to examine any moderating effects.

In Table A6 it is first noted that GDP is negatively related to suicide across most models. One reason why a statistically significant coefficient is not present in all models might be due to the limited degrees of freedom available. To confirm this relationship between GDP and suicide, these models should be replicated as more yearly data becomes available. The inverse relationship between GDP and suicide confirms the patterns seen in the bivariate time series (Figure 1), and this inverse relationship is in accordance with a Mertonian approach to understanding suicide.

The significant coefficient for public health in Model 3 confirms that as public health spending increased, suicides decreased. Further, the effects of GDP decreased by about 12 percent between the baseline model and the model with public health included (b = -61.625 and -54.252, respectively). This finding supports an IAT explanation for the role of the state in counterbalancing the effects of the economy on suicide.

There was no evidence of a relationship between elderly population size and suicide, despite the trends seen in the bivariate time series (Figure A3). One possible explanation is that the economic changes seen in Korea during this period did not trigger any of the salient factors for elderly suicide: deepening senses of fatalism, sensory and perceptual loss, loss of friends or spouses (through death), loss of role meaning, increased costs of health care, or loss of social freedoms (Stack 2000b). Second, it has been argued the age-suicide relationship is specific to gender, with elderly males being more suicide prone than elderly females (Stack 2000a, 2000b). Finally, it can be reasoned that the types of economic changes seen in Korea between 1985 and 2006 might have primarily affected working age adults. Future studies should include age-graded measures of suicide and also include psychological factors, insofar as possible, in order to detect age-graded channels to suicide.

The bivariate trends seen between divorce and suicide in Figure A7 were not found in these multivariate analyses; divorce was not a significant predictor of suicide.

We can speculate here on two general reasons for this finding, first the relationship between economic conditions (especially crisis) and divorce are complex and countervailing; the economy both encourages and restricts divorces. Second, Koreans, and Korean males in particular, might have had particular methods for coping with marital stress in the face of economic difficulties. Both of these issues will be touched upon in the discussion section.

<div align="center">Homicide in Korea</div>

Table A6 presents the results of the multivariate time-series analysis of homicide in Korea. The analytical modeling is identical to the procedures followed in Table A5.

It is first noted that there was no significant relationship between GDP and homicide in any model. Thus, while suicide was responsive to GDP, homicide was not influenced by this measure of the economy. Further, this is contrary to the findings suggested by the bivariate time-series (Figure A2). Even though Figure A2 did hint at a positive relationship during the pre-crisis years and a slight inverse relationship following the crisis, multivariate regressions did not provide statistical evidence of this relationship. It could be the case that these modeling techniques could not accurately depict this complex relationship between the economy and homicide. Future research can attempt to bring more nuanced modeling methods to bear on this question.[11]

There was no evidence of a relationship between divorce and homicide. This is despite the very general trends seen in Figure A8. Just as the case of divorce and suicide,

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[11] Based on the assumption that different logics drive the relationship between the two variables during different time periods, different functional forms of analytical models can be created. For an example of this methodology to the relationship between economic conditions and imprisonment trends, see Raymond J. Michalowski and Susan M. Carlson. (1999) "Unemployment, Imprisonment, and Social Structures of Accumulation: Historical Contingency in the Rusche-Kirchheimer Hypothesis." *Criminology* 37: 217-250.

more sophisticated modeling techniques might be needed to verify any differential effects of divorce on homicide.

Model A8 assessed the mediating effects of institutional balancing, in the form of public health spending, on homicide. While there were no main effects of the economy on homicide in this model, public health spending did have a negative effect on homicide, where greater levels of public health spending were associated with lower homicide rates. This relationship persisted even in the fully saturated Model A9. This inverse relationship between public health spending and homicide is in accord with the bivariate trends between the two, presented in Figure A10. Future research can explore the distinct periods shown in those trends where public health spending and homicides moved in contrary directions, these were the period of low spending and high homicides (approximately 1993 to 1998) and the period of high spending and decreasing homicides (1999 to 2006).

CHAPTER VI
REGIONAL AND CROSS-NATIONAL ANALYSES
Regional Analysis

Having explored the relationship between the economy and violence in Korea and

coming to some general conclusions, the next step in the analysis was to compare these

national findings to results from multivariate time-series analyses from the set of East

Asian nations.

Regional Multivariate Suicide

Table A8 contains the results from the multivariate time-series regression models

testing the relationship between the economy, controls, divorce, and public health

spending on suicide at the regional level. GDP failed to reach significance in any of the

main effects models. However, elderly population was significantly related to suicide in

a positive direction. This effect was mediated somewhat with the inclusion of divorce, in

Model 16. With the inclusion of divorce the effect of elderly population on suicide

dropped by about 24 percent. Interestingly, while public health did not have a main

effect on suicide in Model 17, in the fully specified meditational model, Model 18, it was

inversely associated with suicide. With the inclusion of both divorce and public health in

the model the main effect of elderly population on suicide dropped by about 19 percent.

The moderation models provided some interesting results. It is most appropriate

to first discuss the significant interaction terms in these models. The significant and

positive coefficient for the product term of GDP and divorce indicates that the effect of

GDP on suicide is greater at higher levels of divorce. To better present these results,

Figure A11 plots the marginal effects of GDP on suicide at varying levels of divorce for

the reduced moderating Model 18 and Figure A12 plots the marginal effects of GDP for

the saturated Model 19. An inspection of these charts shows that at lower levels of

divorce there is actually an inverse relationship between GDP and suicide. However,

when divorce rates are higher this relationship becomes positive. It must be remembered

that the location of the value zero for the marginal effect within the confidence intervals, which are represented by the dashed bands, shows a region where the relationship between GDP and suicide is not significant. The vertical dotted line plots the mean value for divorce rates in the data.

In these moderating models the coefficient for the effect of GDP on suicide is not interpreted as it would be for a main effects model. Jaccard and Turrisi (2003) advise that in a model containing product terms XZ, the regression coefficients should be interpreted as the conditional effect of the X variable on the dependent variable when Z equals zero. Thus when divorce is zero the effect of the GDP on suicide is significant and inverse. The significant and negative coefficients for GDP in Models 19 and 21 can be extrapolated to values on the slope of the marginal effects in Figures A11 and A12, respectively.

It is interesting to note that the interaction term in the saturated Model 21 fully mediates any significant effects of public health. And while there is still an effect of elderly population on suicide, this effect is somewhat attenuated, by about 61 percent, when compared to the baseline Model 15.

Regional Multivariate Homicide

Table A9 contains the results from the multivariate time-series regression models testing the relationship between the economy, controls, divorce, and public health spending on homicide. Although the signs of several of the coefficients were in the expected directions, for example GDP, divorce, and public health spending were all inversely related with homicide and the young male population was directly related with homicide, these relationships were not statistically significant.

Cross-National Analysis
Cross-National Multivariate Suicide

Table A10 contains the results from the cross-national multivariate time-series regression models testing the relationship between the economy, controls, divorce, and public health spending on suicide. GDP was significant and negatively related to suicide across all models; wealthier nations had lower levels of suicide than poorer nations. Also, the relationship between elderly population size and suicide was positive and significant across all models. Divorce was included in Model 30 and the coefficient was positive and significant; higher divorce rates were associated with higher suicide rates. The inclusion of divorce mediated the effects of GDP on suicide, but these changes were only minuscule; the magnitude of the coefficient for GDP decreased by less than 1 percent between Model 29 and Model 30. In the full mediational model, Model 32, the magnitude of the GDP coefficient *increased* by about 19 percent over the magnitude in the baseline model.

The moderation models provided some interesting results. The significant and negative coefficient for the product term of GDP and divorce indicates that the effect of GDP on suicide is less at higher levels of divorce. Referring to the product term coefficient Model 33, when divorce increases by one unit the slope of GDP on the economy decreased by 13.910 units. To better present these results, Figure A13 plots the marginal effects of GDP on suicide at varying levels of divorce for Model 33. An inspection of the chart shows when divorce rates are high, the relationship between GDP and suicide relationship becomes weaker then when divorce rates are low. The significant and negative coefficient for the product term of GDP and public health spending indicates that the effect of GDP on suicide is lower when spending levels are higher. In Model 34, the reduced model, the coefficient reveals that as public health spending increases by one unit, the effect of GDP on suicide decreases by 18.702 units.

To better present these results, Figure A15 and Figure A16 plot these marginal effects for the product terms from Models 34 and 35, respectively.

Cross-National Multivariate Homicide

Table A11 presents the results from the cross-national multivariate time-series regression models testing the relationship between the economy, controls, divorce, and public health spending on homicide. GDP was significant and negatively related to homicide across several of the models; wealthier nations had lower levels of homicide than poorer nations. In addition, inequality was positively related to homicide, a finding consistent with other cross-national research on homicide. The relationship between divorce and homicide was significant and positive and further, the inclusion of divorce in the model increased the strength of the negative relationship between the economy and homicide by about 13 percent, between Models 36 and 37. Divorce was included in Model 30 and the coefficient was positive and significant; higher divorce rates were associated with higher suicide rates.

Considering the interaction models, there was a significant negative interaction between GDP and public health spending on homicide in Model 41. This indicates that the slope of GDP on homicide decreased when public health spending increased, a one unit increase in spending resulted in a -9.864 unit change in the effect of GDP on homicide. Figure A17 plots the marginal effects of GDP on homicide at varying levels of public health spending.

CHAPTER VII
CONCLUSION AND DISCUSSION

The analyses in this paper support the main proposition of Merton's anomie theory. Across national and cross-national contexts, economic strains are associated with increases in suicide. At the cross-national level there is an inverse relationship between the economy and homicide.

In addition, the evidence from the analysis of Korea showed support for the state counterbalancing thesis of IAT. Specifically, public health spending appears to mediate some of the effects of the economy on suicide. Finally, there was evidence from the cross-national analyses that the strength of non-economic institutions moderated the effects of the economy on both forms of violence.

The main thrust of this study was to untangle the relationship between the economy and violence in a particular case, Korea. The results of this effort showed that in several instances the evidence from the analysis of Korea departed from what was suggested by theory. Accordingly, this concluding section will attempt to reconcile these apparent contradictions with details from the Korean case. Discussing these unusual findings introduces topics and themes for future research on the relationship between the economy and violence both in Korea and in comparative settings.

GDP, Unemployment, and Labor Market Conditions

This study used GDP as an indicator of economic stress and change. The choice to use GDP was a pragmatic one, based on the need to extend the analysis from the national level to the cross-national level and the need to include as many comparable cases as possible. However, it must be admitted that GDP is not the only indicator of economic structure. There is also debate within criminology about the most appropriate macro indicator of economic stress and strain (Pridemore 2008; Messner, Raffalovich, and Sutton 2010; Sun, Chu, and Sung 2011). Future research should include alternate

indicators of economic structure, paying special attention to the contextual meanings of these indicators. For analyses of Korea, indicators of unemployment and labor markets might bear interesting results.

Even though unemployment is not a particularly robust predictor of violence at the cross-national level (LaFree 1999), unemployment in Korea deserves consideration as an indicator of structural conditions there. Unemployment might be especially salient there because of the magnitude of unemployment growth in the post-crisis years. Unemployment in Korea jumped from two percent in 1996 to over eight percent by the second quarter of 1999. Further, Kwon (2001) notes that because Korean society was accustomed to very low levels of unemployment during the periods of economic growth and industrial expansion, the social impact of this jump in unemployment during the post-crisis years might be greater in Korea than in other settings.

In addition to increasing levels of unemployment, the financial shock also jarred the structure of the Korean labor market. Following the crisis the percentage of daily and part time workers increased, while the percentage of full-time workers dropped. Kwon (2001) points out that during the post-crisis years, the daily and part-time workers in Korea were ineligible for membership in trade unions or benefit plans. The absence of supportive intuitions of course removes an important element of the social safety net. Research findings on local labor markets and crime suggest that these conditions influence crime along the lines of economic stress and strain models (Crutchfield and Pitchford 1997), and therefore it would be useful to explore these local markets in Korea.

In addition, the axe of employment cuts in Korea fell disproportionately across certain social groups and classes, with the most vulnerable groups bearing a large portion of the suffering. In particular women, the less educated, and employees from small-sized firms and businesses bore the brunt of cuts as the business sector adjusted to meet obligations and burdens imposed by financial restructuring (Kwon 2001). The

relationship between the economy and violence might be stronger in these groups that shouldered the greatest weight of the economic crisis.

In light of these details, future research on interpersonal violence in Korea should include alternative macro-economic measures, should strive to include indicators of labor market conditions and structures, and should disaggregated violence to account for at least class, gender, or age.

<div align="center">State Balancing and Public Health</div>

Public health spending did reduce levels of suicide and homicide in Korea. However, there was no evidence that spending mediated the effects of economic conditions on violence or that spending was a moderator of economic conditions. This evidence contrasted with the results from the cross-national analyses. Two general points about social welfare and state balancing in Korea are worth mentioning. First, the Korean social policy system differs somewhat from the dominant Western European paradigm of social policy regimes (Esping-Anderson 1990). Kwon and Holliday (2007) describe the Korean social welfare regime as productivist, a policy instrument first and foremost for economic growth. This organization contrasts with the patterns found in the Western models of welfare capitalism where policies are organized around the general logics of status differential maintenance or for the pursuit of social justice.

Scholars have also noted a theme, in social policy, very specific to Korean political development. Kwon (1999) argues the genesis and trajectory of social welfare development in Korea was in the need for military regimes to legitimize themselves following the unlawful seizures of executive power. Indeed, policy researchers point to a gap between social welfare legislation and implementation, what is written on paper and what is put into practice, in Korea as evidence of the political character of the policy. This political character lead to a social welfare system by which regimes sought mainly

to give the impression of social action rather than delivering social outcomes (Shin 2000; Shin and Shaw 2003).

Some have pointed to the post-crisis years a period of reform and change in the Korean social welfare system. A political opening, as the administration of Kim Dae-Jung took power alongside the economic window of opportunity, coupled with social need and joined by the activism of social and civic groups in the post-crisis years did provide a favorable context for social policy changes (Park 1999). This argument might undermine the claim that Korean social policy still bears the stamp of political legitimacy efforts.

However, there is debate on the character and effects of the post-crisis changes. For example, post-crisis unemployment scheme does not cover many categories of temporary and part-time workers; only 52 percent of salaried workers were covered by the plan. In addition the pension program leaves 45 percent of workers uncovered. These uncovered workers are mostly the self-employed, temporary and daily workers, and workers from small firms (Park 1999). Medical coverage is characterized by low benefit coverage and high out-of-pocket payments. Finally, strict conditions on the social rights entitlements limited these payments just a small portion of society. In dissecting the post-crisis policy reforms, Kwon and Holliday (2007) sum up the shifts as more of the same, noting that policy still is used to support labor market flexibility, industrial competitiveness and economic growth in global markets.

Finally, the policy measure in this study, public health spending, is only one of many possible indicators of state balancing; researchers are currently debating and exploring how other channels of state intervention might balance corrosive pressures from the economic sphere (Bjerregaard and Cochran 2008; Pratt and Godsey 2002, 2003). In the original formulation of IAT, Messner and Rosenfeld (1997, 2007) noted the key concept was how non-economic institutions balanced against economic dominance of

the social sphere. The generality of the theory leaves the door wide open for the inclusion a variety of state and non-state indicators in hypotheses and analytical models.

If one chooses to focus on state balancing efforts in Korea, then one must be aware of the nuances of government spending there. In the Korean context, because public health spending did not receive the lion's share of state effort, perhaps this indicator is not the most appropriate measure of state balancing. Shin and Shaw (2003) point out that the Korean government emphasized the role of human capital in boosting the economy and instead as traditionally, at least pre-crisis devoted more spending resources on education, and housing and community development, at least pre-crisis.

In conclusion, work on the relationship between the economy and violence in Korea should consider the effects of institutional balancing on the relationship between the economy and violence. However, researchers looking at state balancing should be aware of the specific logics, nuances, and historical legacies of Korean social policy while at the same time understand the differences between legislated policy and policy in practice. And, research should also take into consideration the full basket of policy measures, and meanings attached to these, which were available to the Korean government.

<div align="center">Divorce</div>

The multivariate analyses did not find evidence of any relationship between divorce and violence in Korea. This finding contrasts with evidence from the regional and cross-national analyses where both direct and moderational effects were found. This also contrasts with findings from cross-national studies (Bjerregaard and Cochran 2008). Why is Korea different when it comes to family structure and violence?

It is important to consider the complicated relationship between the financial crisis and family stability in Korea. Kim (2001) notes the financial crisis had

countervailing effects on divorce rates in Korea. For example, while divorce rates in rapidly increased up to 1996, the rates stabilized briefly, until about 1998, and then continued to rise. Kim hypothesized that while the crisis increased divorce, through traditional stressors such as issues of household income and associated domestic conflicts, at the same time the crisis made it difficult for couples to seek divorce because they were unable to achieve financial independence during the crisis years. This complicated relationship between the economy and family stability calls into question the meanings of marriage and divorce when there are structural impediments to maintaining or dissolving the relationship.

In addition, cultured and gendered coping mechanisms should be considered, especially when considering the role of interpersonal stress on marriage stability. One model of family stress posits that economic pressures increase marital stress and decrease marital satisfaction because pressure creates emotional distress, absent coping methods (Conger and Elder 1994).[12] In one study this model was empirically verified for Korean females, but the theorized linkages between economic pressure and marital satisfaction did not apply to Korean males (Kwon et al. 2003). While Korean males did experience emotional distress from economic pressures, these negative emotions were not channeled into marital conflict and did not influence marital satisfaction. Kwon et al. (2003) argued that Korean husbands did not direct their stress towards the family but instead could release these negative emotions in other contexts.

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[12] This notion is of course very similar to the key propositions of Agnew's General Strain Theory of crime which posits at the individual level negative emotional states lead to crime and deviant behavior in the absence of sufficient coping mechanisms.

Alcohol

In seeking to understand interpersonal violence in Korea, the role of alcohol should be considered in any future study. There has been debate on the effects of alcohol on forms suicide; Emile Durkheim originally noted that in Europe, suicide and alcohol consumption both trended together. However, he concluded this relationship was spurious; Durkheim noted that "suicide has most victims among the most cultivated and wealthy classes and alcoholism does not have its most numerous followers among them" (1979: 77).   However, later theorists have argued for the inclusion of alcohol consumption as a structural cause of suicide at macro levels. Stack (2000a) summarized five key linkages between alcohol consumption and suicide insofar as very high levels of drinking can contribute to suicide through the generation of: depression, emotional dis-inhibition, lower self-esteem, social isolation, and associated pharmacological effects.

Alcohol also might influence Korean homicide rates. Homicide researchers have argued that alcohol consumption might influences homicide through disinhibition effects, this relationship between drinking and homicide through direct, mediational, or moderational effects (Parker 1995).   There is a large body of recent research on the relationship between alcohol consumption and homicide in Russia; findings from that research support the alcohol – violence link (Pridemore 2002, 2006; Pridemore and Chamlin 2006). Indeed, some early statistics from Korea have shown that nearly 75 percent of individuals charged with murder in Korea were drunk at the time of the murder (Sharpe et al. 2001).

Alcohol plays an important role in Korean society and culture, serving as a form of social interaction and exchange. Korean society encourages drinking, especially among men. Among men the culture of special drinking establishments contributes towards the creation and maintenance of group identity. Further, drinking practice and

drinking settings in Korea encourage communication and are argued to ease conflict and aid in conflict resolution (Sharpe et al. 2001).

Scholars of violence note that the type of alcohol consumed in a society not only helps define the specific drinking culture, but also has implications for violence. Korea has been categorized as a "wet" drinking culture, similar to Russia and Finland, where distilled spirits form the large portion of alcohol consumed (Khang, Lynch, and Kaplan 2005). The traditional distilled rice wine *soju* is a favorite drink in Korean society. Researchers on the alcohol-violence link have argued that distilled spirits can result in a deeper and quicker intoxication (Pridemore and Chamlin 2006).

Some recent research on Korean drinking patterns during and following the economic crisis provide interesting information, although this research does not provide clear-cut support on any alcohol-violence link. In 1998 deaths from alcohol dependence increased among adults and the aged in. However, these mortalities were only a small proportion of total mortality during that period (Khang et al. 2005). Other alcohol related morbidities, such as heart and liver diseases, did not increase appreciably during the financial crisis. At the same time, statistics from the Korean national tax agency showed that the quantity of alcoholic beverages purchased actually declined from 1996 to 2000; social surveys showed that Koreans actually decreased binge drinking between 1995 and 1998 (Khang et al. 2005).

There are sound theoretical reasons to suspect that alcohol is implicated in violence. And even though the extant research on alcohol and violence in Korea is very limited given the role and importance of alcohol in Korean culture, future work should strive to incorporate measures of drinking in analytical models.

Age Structure and Violence

This study did not find any association between elderly population size and suicide in Korea. This contrasts with the positive association noted at the cross-national and regional levels. The lack of an association is even more surprising considering some recent research on the elderly and suicide in Korea which suggests elderly persons there are more susceptible to both suicides and suicidal thinking. Kim et al. (2010) found that between 1995 and 2005 the greatest increase in suicide rates in Korea was among the elderly. Several reasons specific to Korea have been suggested as causal factors for this finding. First, the elderly were more likely to be living in rural areas; while 18.6 percent of the Korean population lived in rural areas, 37.1 per cent of the elderly resided there. The underlying assumption is that rural elderly might not have been able to receive the same amount of social support as the urban elderly and were therefore more susceptible to emotional and material pressures and strains. Second, it is argued that elderly in Korea are particularly sensitive to economic stresses and financial hardships. This sensitivity is in part to the decline of the traditional family structure and also the relative unreliability of old-age pensions. Third, it is relatively simple to obtain lethal chemicals and products, especially in the countryside. Kim et al. (2010) note how easy it is for Koreans purchase or otherwise access pesticides, sources of carbon monoxide, and other types of lethal poisons and gasses in Korea.[13]

This study, however, did not find any association between elderly population size and suicide in multivariate analyses. It must be noted the suicide data for this analysis

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[13] Lee et al. (2008) discuss in detail the relationship between pesticides and suicide in Korea between 1996 and 2005. In bivariate relationships, the vast majority of suicides involving pesticides during the period were among males, those 50 years and older, those living in rural areas, and with those people with less than a high school education. The picture that emerges is one of the socially disadvantaged including a lack of social supports.

was not age-graded. In addition, there was no control for urban-rural residence. Studies which have found the association between age structure and suicide rates use age-graded measures of mortality and suicide (Kim et al. 2010; Park and Lester 2006). However, these studies are based on bivariate time-series analyses and generally do not include control variables into their analytical models. Clearly the direction forward is to not ignore the arguments on age and suicide but to add to these by including data on marginal status of the elderly and age-graded suicide figures.

This study did not find any relationship between age structure and homicide in Korea. This was even despite the fact of an inverse bivariate relationship. While this finding was not critical to the study, it does raise some interesting questions. Unfortunately, no studies could be found which specifically addressed youth and homicide in Korea. In the English-language literature the analysis of young males and crime is currently also very limited. Indeed, two recent empirical studies of crime in Korea do not even include young male population percentages in analytical models (Joo and Yoon 2008; Yoon and Joo 2005). And there might be good comparative reason for not including young males in these analytical models; in 2004, only 18.5 per cent of homicide suspects in Korea were under the age of 30, while in America, for comparison, the percentage of homicide suspects for a similar age range was 57.2 per cent (see Johnson 2004).

We can look to Japan, which resembles Korea in several social and cultural dimensions, to see relationships between age structure and crime which do not match with criminological theories predicting a strong association between young males and violence. Analyses of homicide in Japan show that young males there commit far fewer homicides than their counterparts in other nations (Johnson 2008) and that the relationship between young males in the population and homicide rates was not consistent (Roberts and LaFree 2004). It could be the case that while in general, young

males in Japan are more crime prone than older males, but the causal chains leading to homicide, as opposed to other forms of crime, are not as strong as they are in western nations.

It has been argued that the strict educational tracking and job selection criteria in Japan might partially explain why young males do not resort to violent crime such as homicides. In this light, young Japanese males become risk-averse to violence and instead channel their energies into resource holding ability, i.e. academic and career success (Hiraiwa-Hasegawa 2005). Because of the similarity educational and occupational structure found in Korea, future work can explore this risk-aversion hypothesis assertion there. At the very least, future research on crime in Korea should be aware that the age structure of society might not correlate as closely with crime as Western-based theories purport.

<div align="center">Theory: Modernization and Korea</div>

This study explored the possibility that rapid modernization in Korea could be related to forms of personal violence, the Durkheimian framework of analysis. The main mechanisms of this argument were increases in egoism and decreases in social regulations and controls driving increases in violence. In addition, modernization was theorized as having the potential to challenge an existing collective conscience. If this avenue of research on modernization and violence is explored further, future research should seek to overcome some limitations of the theoretical framework and empirical interpretation of modernization used in this study.

For the sake of comparability across analytical levels, I used a rather parsimonious measure of modernization, GDP. However, the true relationship between modernization and violence might be much more complicated than I specified in this

paper. Any misspecifications would of course mask any positive relationships between economic changes and violence in the data.

The Durkheimian model of modernization might not be the best model to employ because of ambiguities contained within it. As it stands, there are several ways to interpret his arguments. For example, a more nuanced look at social change and violence in Korea can place social change as a variable exogenous to both economic change and to violence. The roots of this specification lie in an understanding of organic development, when societal development could mitigate any emergent economic contradictions or value clashes we should not expect to see corresponding high rates of violence (Messner 1982).

Researchers have speculated that social change can best be indicated by the interplay between population growth and urbanization and the effects these have on both economic conditions and upon rates of crime and violence. For example, Sun, Chu, and Sung (2010) argue that these factors of change and modernization have both direct effects and indirect effects (through economic conditions) on crime and violence. Following a Durkheimian logic, while rapid population growth will increase crime of violence it will also increase unemployment levels and income inequality. At the same time rapid population growth should decrease GDP. However, urbanization is argued to follow a pattern of organic development, thus high levels are associated with decreases in violent crime and also decreases in unemployment, and income inequality while at the same time increasing GDP.

Population patterns in Korea during the era of industrialization show that changes there fit more along the lines of Messner's (1982) organic model of development, rather than an abnormal one, despite the rapidity of change. For example, Hashiya (1996) notes that patters of Korean population movements in the 1960s and 1970 were "unipolar," owing in large part to political decisions to concentrate burgeoning industrial efforts in

only a few provinces, namely Gyeonggyi and Gyeongsang provinces. Later political decisions, such as the development of industrial estates in the capital Seoul, further pulled rural populations into urban areas.

And while there was the problem with urban poor during Korea's economic development, a closer inspection shows that impoverished urban communities might not have been a factor in increasing disorder and crime, as they might be in some areas. For example, Hashiya (1996) also notes that up to the mid-1990s the urban poor were primarily immigrants from the rural areas. In Seoul, they formed into shantytowns and communities but also activated kinship networks from their rural areas, thus finding an important source of social support. In addition, during the era of rapid economic growth the urban poor not only had wages which were somewhat better than their rural counterparts, but they also were able to rely upon constant work even if it was in the form of daily, part-time, or temporary labor. In the case of Korea it seems that during this period some employment was certainly better than no employment. In fact, Hashiya hesitates to describe this labor market, for urban poor, as being a secondary labor market or an informal labor market; those terms are best used to describe the situation in countries stuck in underdevelopment. Instead, in Korea immigrants from the countryside were linked up with the formal economy and there was no evidence for a situation of concentrated disadvantage so conducive to crime and disorder (Wilson 1987).

General Findings

Based on the empirical observation that national economies have been dynamically shifting and changing over the past several decades alongside the fact of increases in global levels of personal violence, this study was guided by several general questions. The findings of this study bear on these questions.

First, this study incorporated measures of two forms of interpersonal violence, suicide and homicide, on the assumption that both forms would be responsive to similar economic factors. The findings from this research show that the measure of economic change here, GDP, was predominantly related to suicide over homicide. While economic growth reduced levels of both forms of violence in the cross-national context, at the national level it was suicide which was most responsive to GDP. This finding implies that scholars should be cautious when considering suicide and homicide as outcomes from similar processes. Including individual level characteristics, such as status characteristics of race and socio-economic status (see Henry and Short 1954; Unnithan et al. 1994) would be one way to tease out why one form of violence was more responsive than the other. Of course, scholars working with macro-data might have trouble obtaining these individual level measures.

Second, the functional form of the economy-violence relationship was not consistent across settings. At the national level this relationship was mediated by institutions of state balancing. This mediational relationship was absent at the regional and cross-national levels. The cross-national analysis showed evidence of a moderating relationship between the economy, violence, and non-economic institutions. More research is needed to understand why these differences appeared.

These general results speak against making claims about unilateral and general processes operating across all nations. This study has shown that one single theoretical position does not completely explain the relationship between the economy and all forms of violence across all settings. This is a call to researchers to continue to engage in research on the global, structural causes of violence while at the same time being attentive to local divergences and differences.

APPENDIX A
TABLES AND FIGURES

Table A1: National (Korean) Correlations and Descriptive Statistics (n = 22)

	1.	2.	3.	4.	5.	6.	7.	8.
1. Suicide								
2. Homicide	0.578**							
3. GDP	0.838**	0.784**						
4. Elderly	0.940**	0.597*	0.938**					
5. Young Males	-0.957**	-0.502*	-0.871**	-0.978**				
6. Inequality	-0.005	0.456*	0.304	0.126	-0.026			
7. Divorce	0.897**	0.646**	0.892**	0.902**	-0.900**	-0.048		
8. Public Health	0.782**	0.435*	0.843**	0.889**	-0.861**	-0.088	0.867**	
Mean	13.159	1.569	0.612	0.061	0.189	29.049	1.854	1.854
Standard Deviation	5.930	0.332	0.264	0.014	0.015	1.416	0.821	4.937

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

Table A2: Nations Included in Regional Analysis (n = 6)

Hong Kong
Japan
Republic of Korea
Singapore
Thailand
Taiwan

Table A3: Regional Correlations and Descriptive Statistics (n = 58)

	1.	2.	3.	4.	5.	6.	7.	8.
1. Suicide								
2. Homicide	-0.551**							
3. GDP	0.553**	-0.776**						
4. Elderly	0.798**	-0.435**	0.612**					
5. Young Males	-0.499**	0.629**	-0.660**	-0.742**				
6. Inequality	-0.474**	0.089	-0.357**	-0.229**	-0.207**			
7. Divorce	0.623*	-0.300*	0.402**	0.276*	-0.128	-0.581**		
8. Public Health	0.562**	0.030	0.412**	0.747**	-0.315*	-0.538**	0.419**	
Mean	13.432	2.891	0.802	9.374	16.227	35.633	1.879	3.441
Standard Deviation	5.633	2.747	0.151	3.974	1.842	6.697	0.579	1.911

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

Table A4: Nations Included in Cross-National Analysis (n = 50)

Albania	Ireland	Sweden
Armenia	Italy	Switzerland
Australia	Japan	Taiwan
Austria	Republic of Korea	Thailand
Azerbaijan	Kyrgyz Republic	Ukraine
Belarus	Latvia	United Kingdom
Bulgaria	Lithuania	United States
Croatia	Mexico	Uruguay
Czech Republic	The Netherlands	Venezuela
Denmark	New Zealand	
Dominican Republic	Norway	
Egypt	Poland	
El Salvador	Portugal	
Estonia	Romania	
Finland	Russian Federation	
France	Singapore	
Georgia	Slovak Republic	
Germany	Slovenia	
Greece	South Africa	
Hungary	Spain	

Table A5: Cross-National Correlations and Descriptive Statistics (n = 50)

|	1.	2.	3.	4.	5.	6.	7.	8.
1. Suicide								
2. Homicide	0.161							
3. GDP	0.118	-0.390**						
4. Elderly	0.460**	-0.419**	0.544**					
5. Young Males	-0.321*	0.016	-0.344*	-0.480**				
6. Inequality	-0.369**	0.550**	-0.465**	-0.660**	0.226			
7. Divorce	0.638**	0.024	0.247†	0.340*	0.025	-0.356*		
8. Public Health	0.356*	-0.347**	0.680**	0.693**	-0.363**	-0.622**	0.040*	
Mean	14.300	5.761	0.823	11.889	16.040	34.133	1.872	4.569
Standard Deviation	10.527	7.802	0.146	4.363	5.376	8.044	1.043	2.012

$*p < .05, **p < .01$

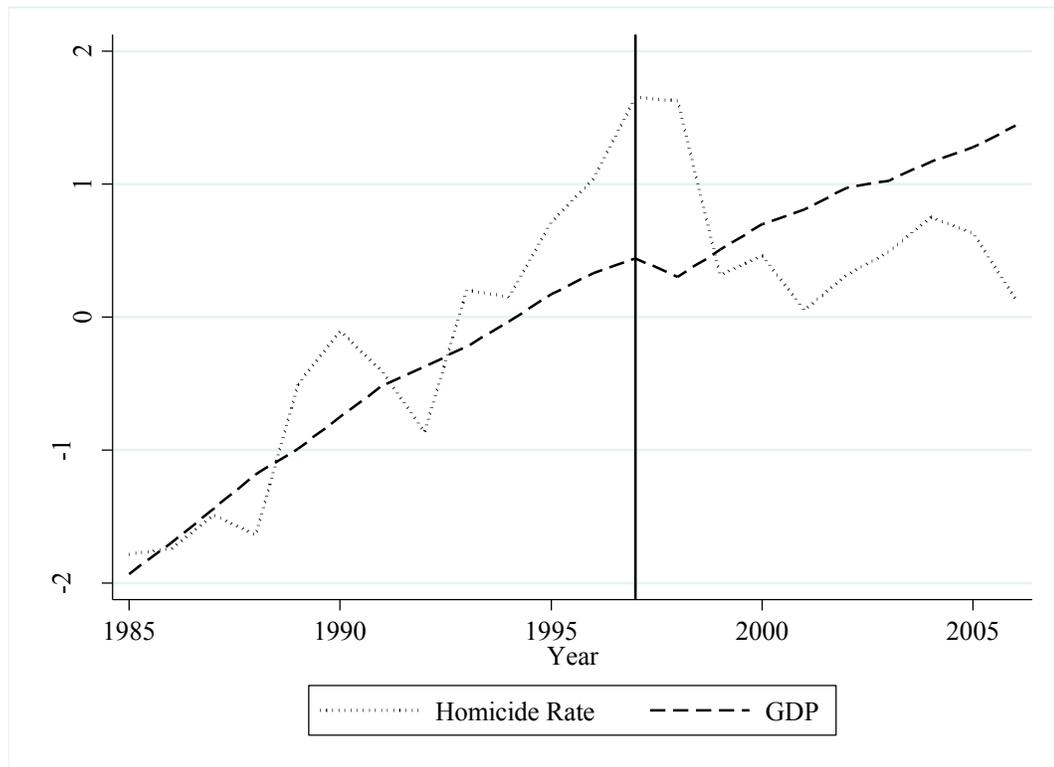**Figure A1: Trends in Korean Suicide Rates and GDP (1985 – 2006)**
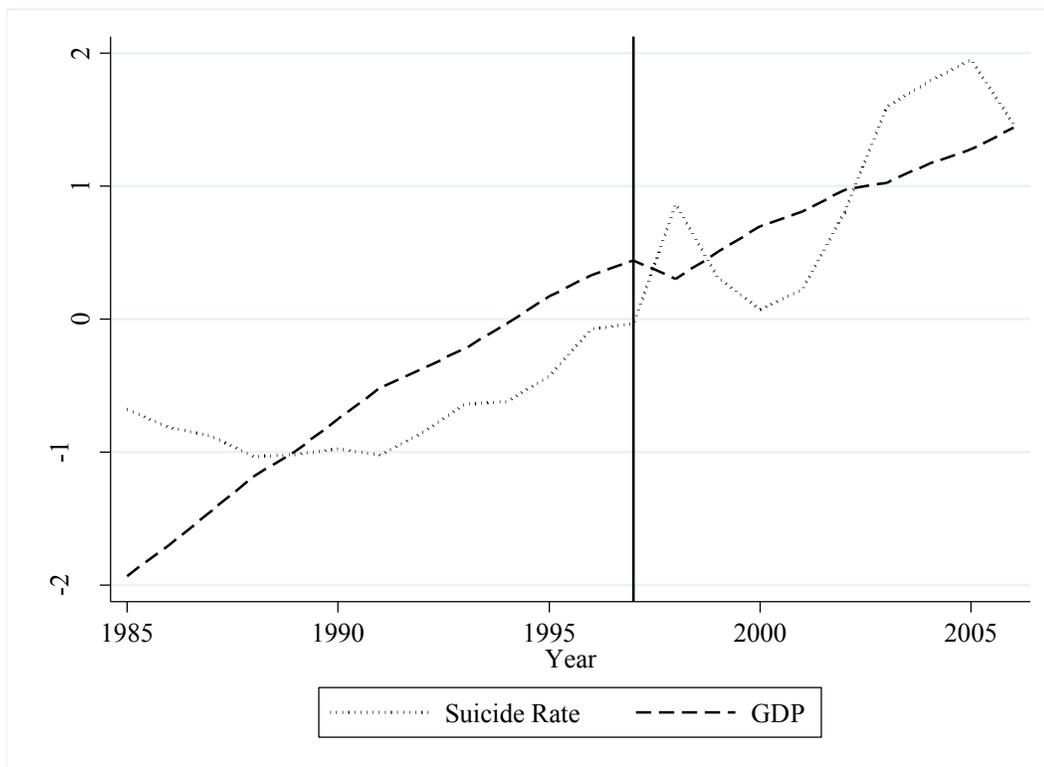
Figure A2: Trends in Korean Homicide Rates and GDP (1985 – 2006)

Figure A3: Trends in Korean Suicide Rates and Elderly Population (1985 – 2006)
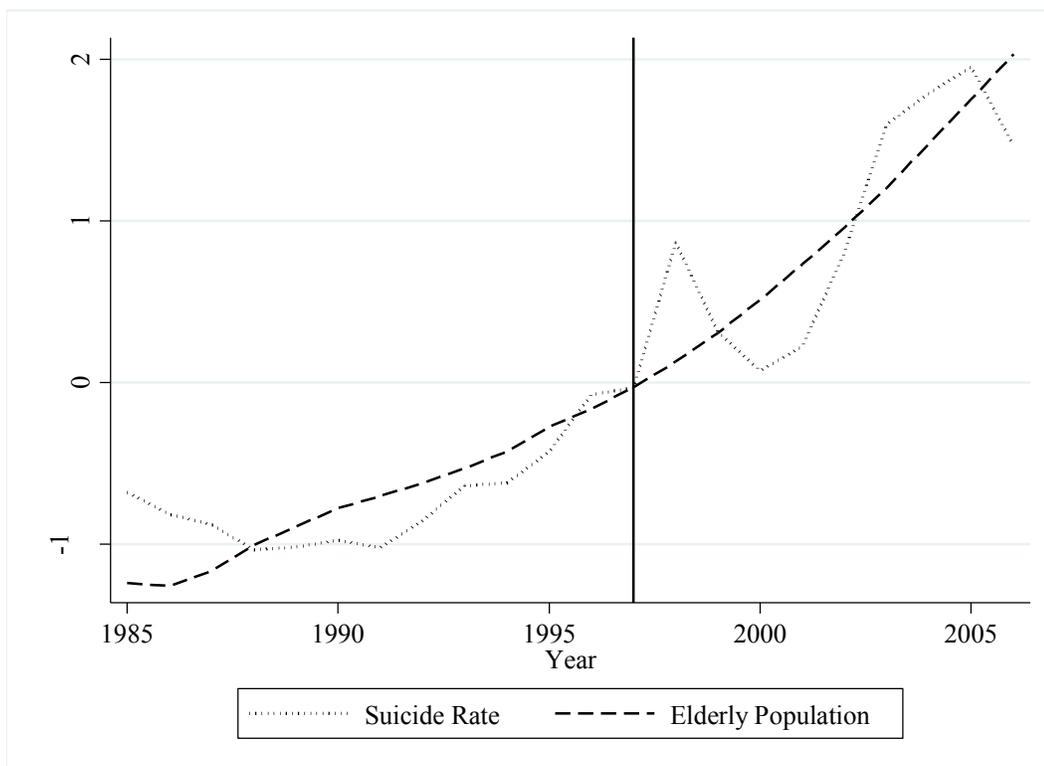
**Figure A4: Trends in Korean Homicide Rates and Young Male Population
(1985 – 2006)**
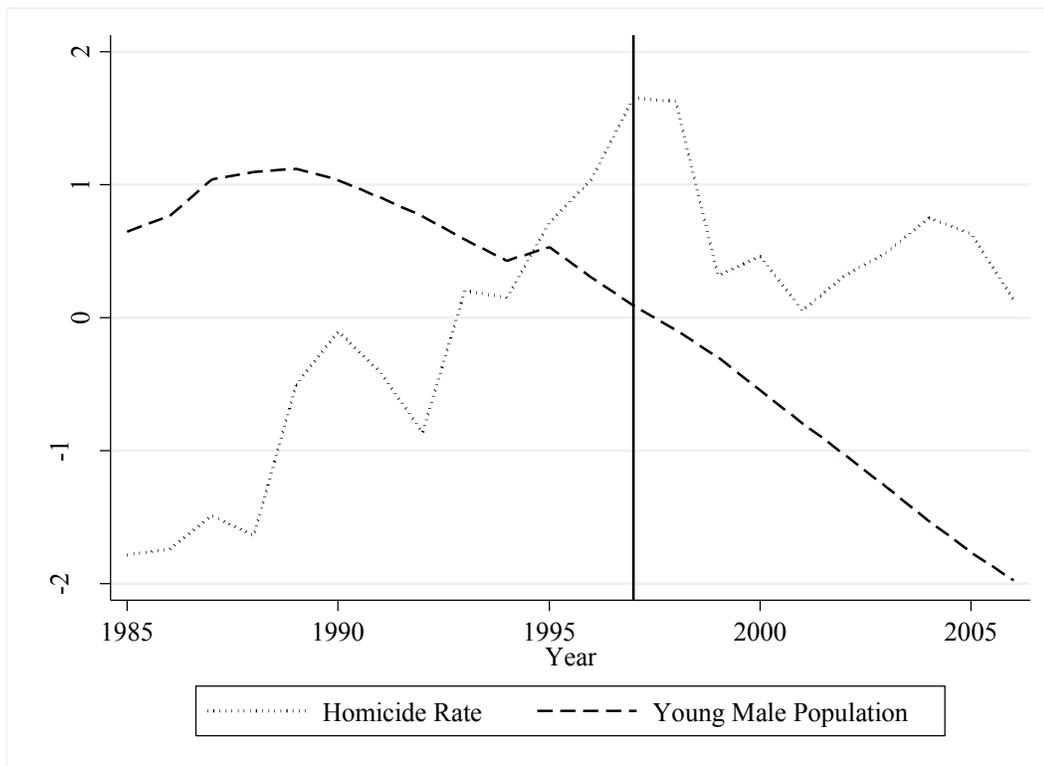
Figure A5: Trends in Korean Suicide Rates and Inequality (1985 – 2006)
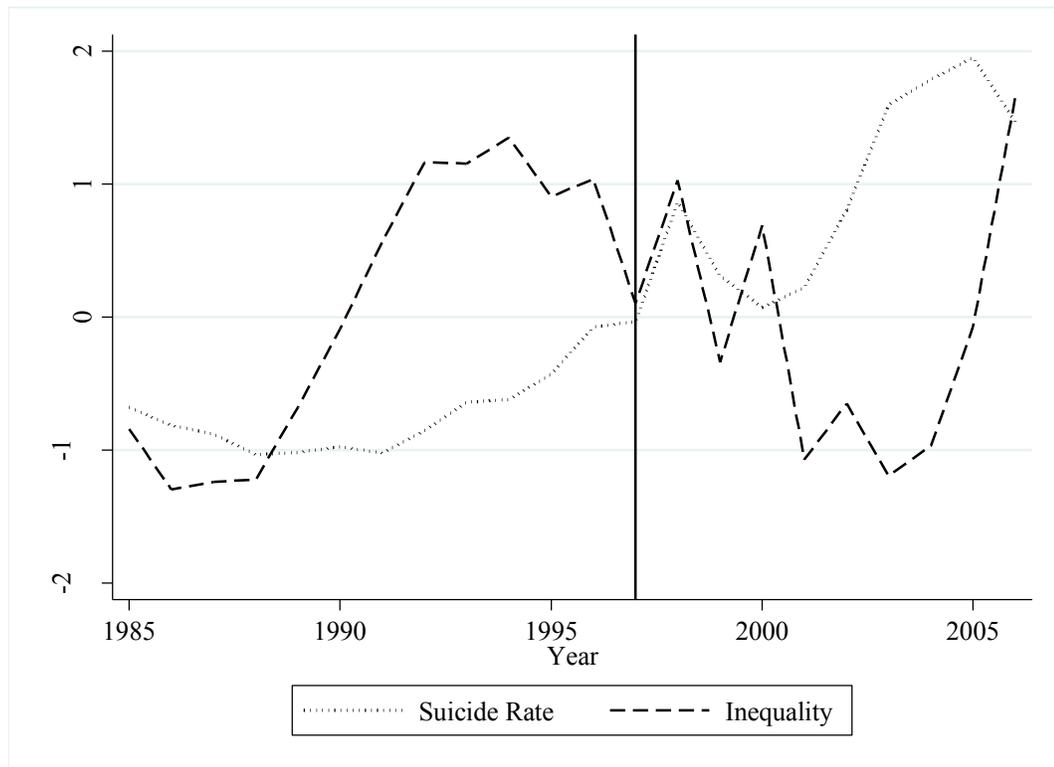
Figure A6: Trends in Korean Homicide Rates and Inequality (1985 – 2006)
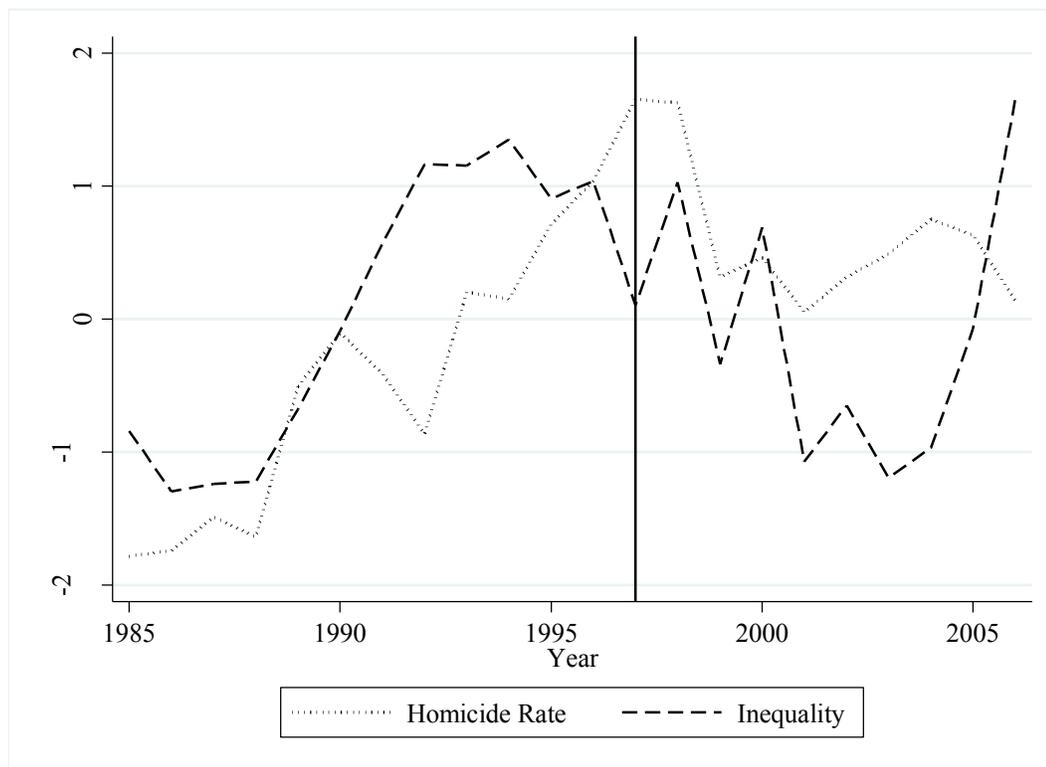
Figure A7: Trends in Korean Suicide Rates and Divorce (1985 – 2006)

Figure A8: Trends in Korean Homicide Rates and Divorce (1985 – 2006)

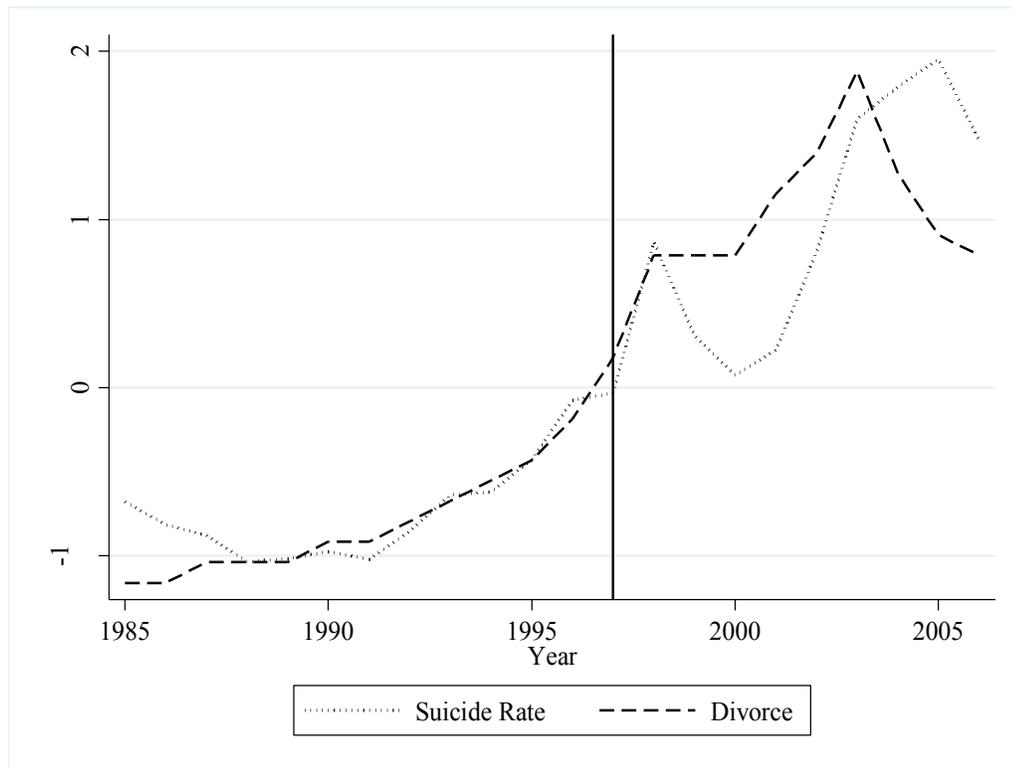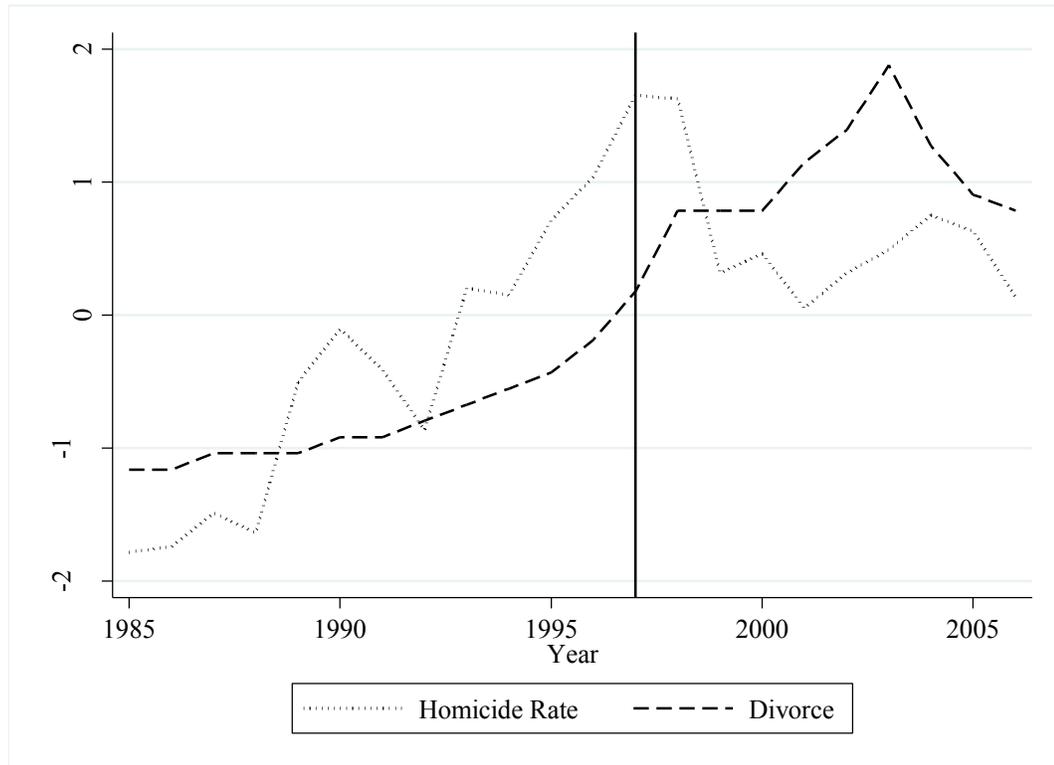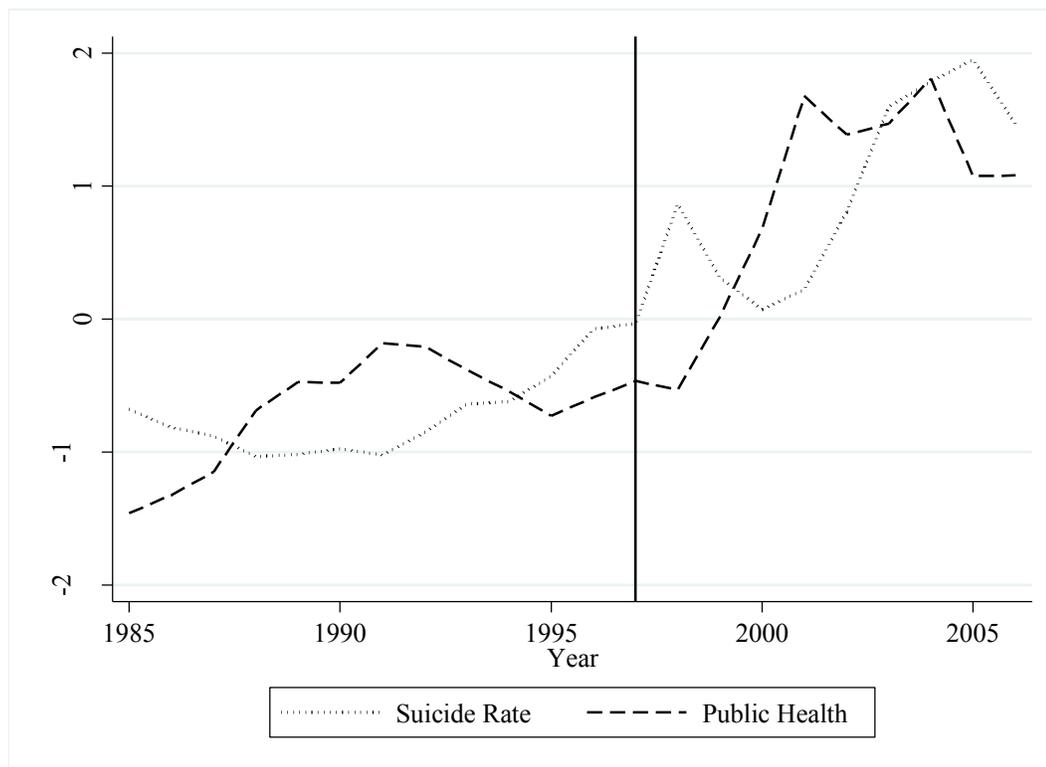**Figure A9: Trends in Korean Suicide Rates and Public Health (1985 – 2006)**

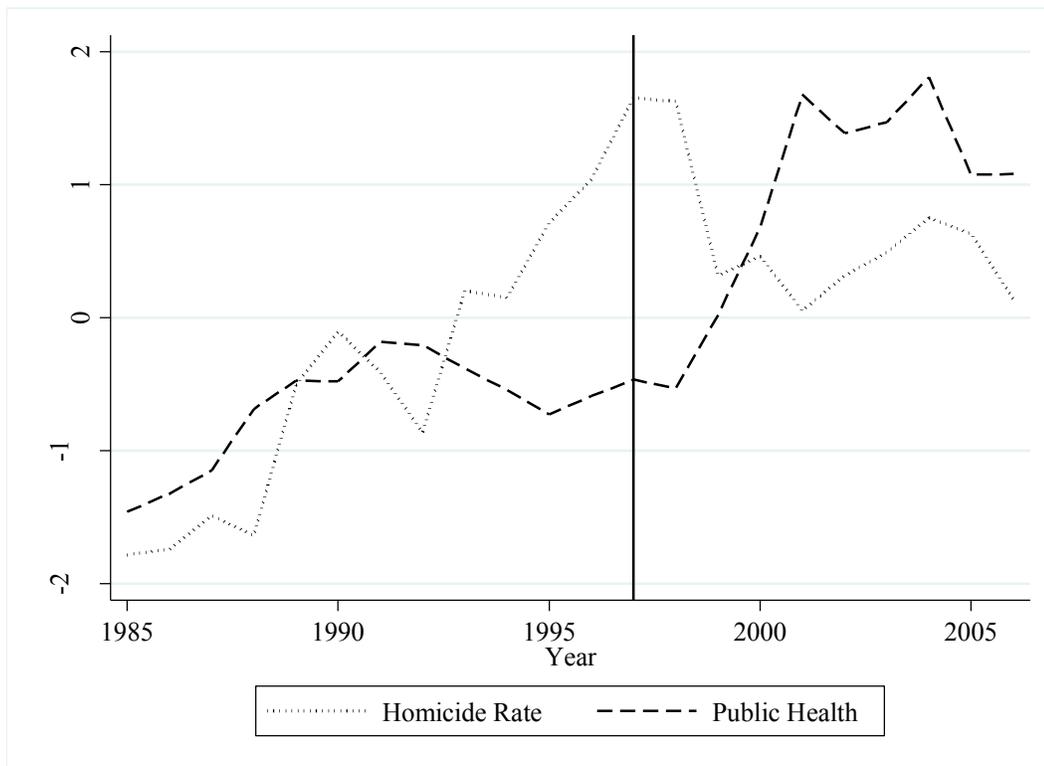**Figure A10: Trends in Korean Homicide Rates and Public Health**
(1985 – 2006)

Figure A11:
Marginal Effects of GDP on Suicide at Varying Levels of Divorce
Regional Data

Divorce Rate
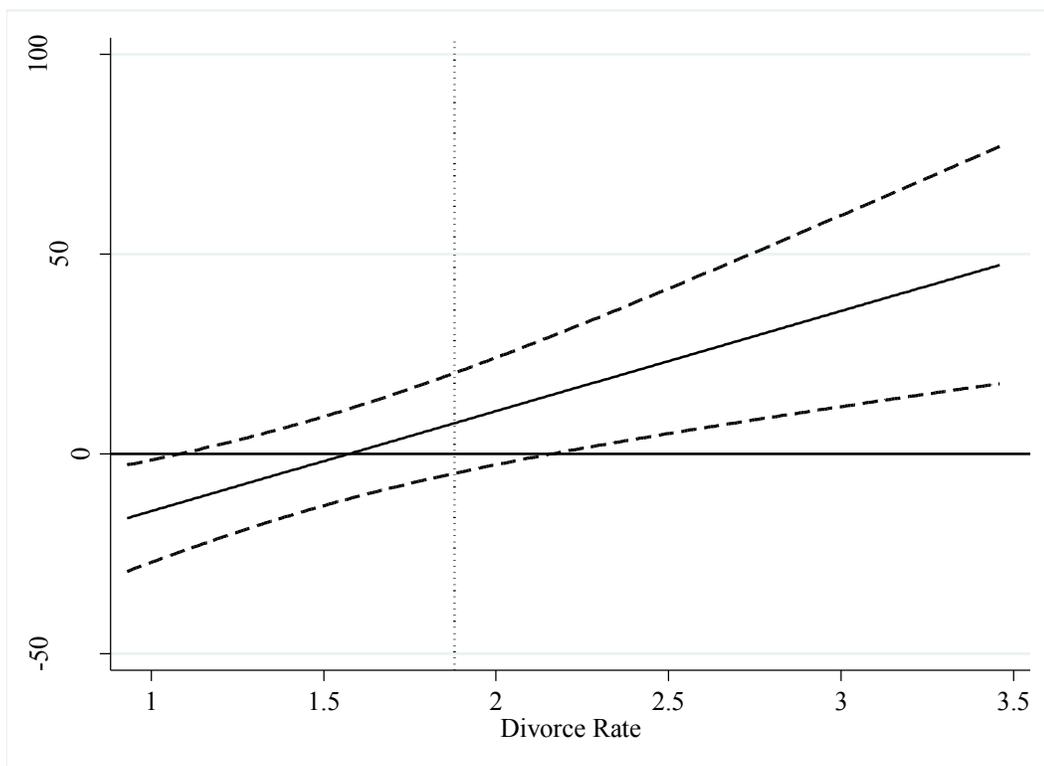
Table A6: Korean Suicide

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Suicide							
GDP	-61.625**	-48.397*	-54.252**	-35.049	-37.442	-54.620**	-29.765
	(7.797)	(16.672)	(8.395)	(19.785)	(18.244)	(8.523)	(17.864)
Elderly	-212.409	-22.096	-111.896	162.346	195.536	-125.081	264.002
	(221.080)	(324.915)	(219.303)	(341.079)	(412.436)	(208.156)	(384.164)
Inequality	0.002	0.150	-0.288	-0.123	0.080	-0.282	-0.150
	(0.405)	(0.475)	(0.432)	(0.478)	(0.537)	(0.467)	(0.528)
Divorce		2.297		2.947	7.103		5.871
		(2.757)		(3.008)	(6.746)		(6.512)
Public Health			-1.113*	-1.271		-1.313	-1.592
			(0.517)	(0.650)		(1.153)	(1.703)
GDP*Divorce					-5.717		3.518
					(8.994)		(9.667)
GDP*Public Health						0.270	0.482
						(1.725)	(2.854)
Year	3.741	2.537	3.468**	1.786	1.870	3.466**	1.427
	(0.687)	(1.558)	(0.718)	(1.743)	(1.556)	(0.755)	(1.631)
Constant	-7401.894	-5007.354	-6853.131**	-3535.477	-3715.034	-6849.158	-2827.533
	(1347.689)	(3067.246)	(1409.534)	(3434.632)	(3063.086)	(1486.012)	(3211.243)
Adj. R^2	0.793	0.789	0.837	0.853	0.790	0.837	0.852
Obs	22	22	22	22	22	22	22

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

Table A7: Korean Homicide

	Model 8	Model 9	Model 10	Model 11	Model 12	Model 13	Model 14
Suicide							
GDP	-0.687	0.456	1.202	2.063	2.463	-0.523	0.957
	(1.895)	(2.137)	(2.601)	(2.295)	(3.205)	(4.039)	(4.126)
Young Males	30.091	22.641	20.973	13.591	-0.227	39.141	24.425
	(14.505)	(14.923)	(19.287)	(17.499)	(28.270)	(34.467)	(39.263)
Inequality	0.022	0.041	-0.040	-0.013	0.013	-0.023	-0.006
	(0.038)	(0.040)	(0.041)	(0.047)	(0.056)	(0.055)	(0.061)
Divorce		0.196		0.191	1.065		0.419
		(0.156)		(0.138)	(0.860)		(0.637)
Public Health			-0.167**	-0.162*		-0.356	-0.321
			(0.054)	(0.055)		(0.351)	(0.343)
GDP*Divorce					-1.237		-0.346
					(1.141)		(0.843)
GDP*Public Health						0.283	0.256
						(0.571)	(0.514)
Year	0.127	0.042	0.072	-0.004	-0.011	0.128	0.037
	(0.102	(0.125)	(0.146)	(0.132)	(0.147)	(0.172)	(0.172)
Constant	-258.188	-88.638	-143.999	6.793	21.360	-258.774	-76.452
	(205.377)	(250.679)	(294.187)	(265.076)	(296.386)	(348.425)	(348.803)
Adj. R^2	0.447	0.521	0.522	0.870	0.629	0.852	0.842
Obs	22	22	22	22	22	22	22

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

Table A8: Regional Suicide

	Model 15	Model 16	Model 17	Model 18	Model 19	Model 20	Model 21
Suicide							
GDP	0.443	-0.376	0.612	-2.384	-39.365**	-13.057	-35.948**
	(10.750)	(7.877)	(10.843)	(7.334)	(11.481)	(15.490)	(9.328)
Elderly	2.088**	1.583**	2.039**	1.699**	0.647	1.973**	0.834*
	(0.526)	(0.449)	(0.545)	(0.421)	(0.423)	(0.548)	(0.373)
Inequality	-0.053	0.041	-0.037	-0.027	-0.059	-0.052	-0.152
	(0.115)	(0.095)	(0.127)	(0.097)	(0.096)	(0.128)	(0.097)
Divorce		4.342**		5.598**	-15.694**		-14.687**
		(0.940)		(1.048)	(5.566)		(5.230)
Public Health			0.322	-1.547*		-4.060	-0.680
			(0.851)	(0.650)		(3.672)	(1.790)
GDP*Divorce					25.044**		25.242**
					(6.876)		(6.576)
GDP*Public Health						5.336	-1.284
						(4.307)	(2.347)
Year	0.045	-0.273*	0.016	-0.313**	-0.049	0.060	-0.071
	(0.129)	(0.110)	(0.132)	(0.095)	(0.102)	(0.136)	(0.089)
Wald Chi^2	2118.91	4052.89	2264.38	5245.88	7169.12	2254.39	10138.95
Obs	58	58	58	58	58	58	58

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

Figure A12:
Marginal Effects of GDP on Suicide at Varying Levels of Divorce
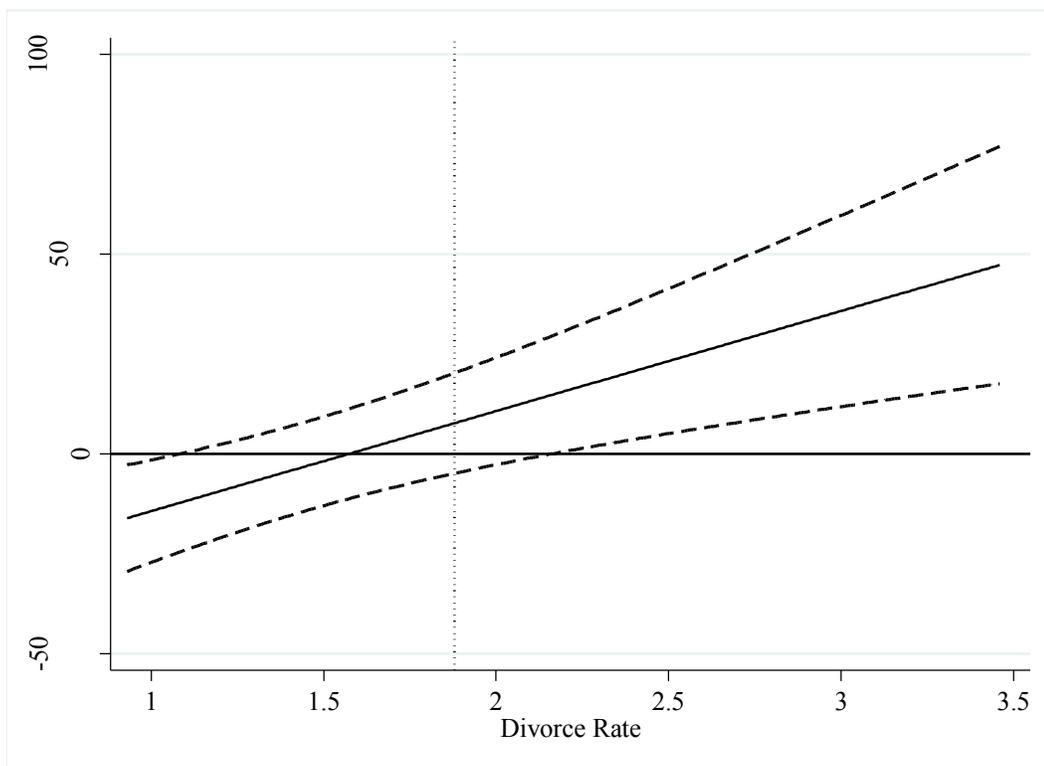**Regional Data**

Figure A13:
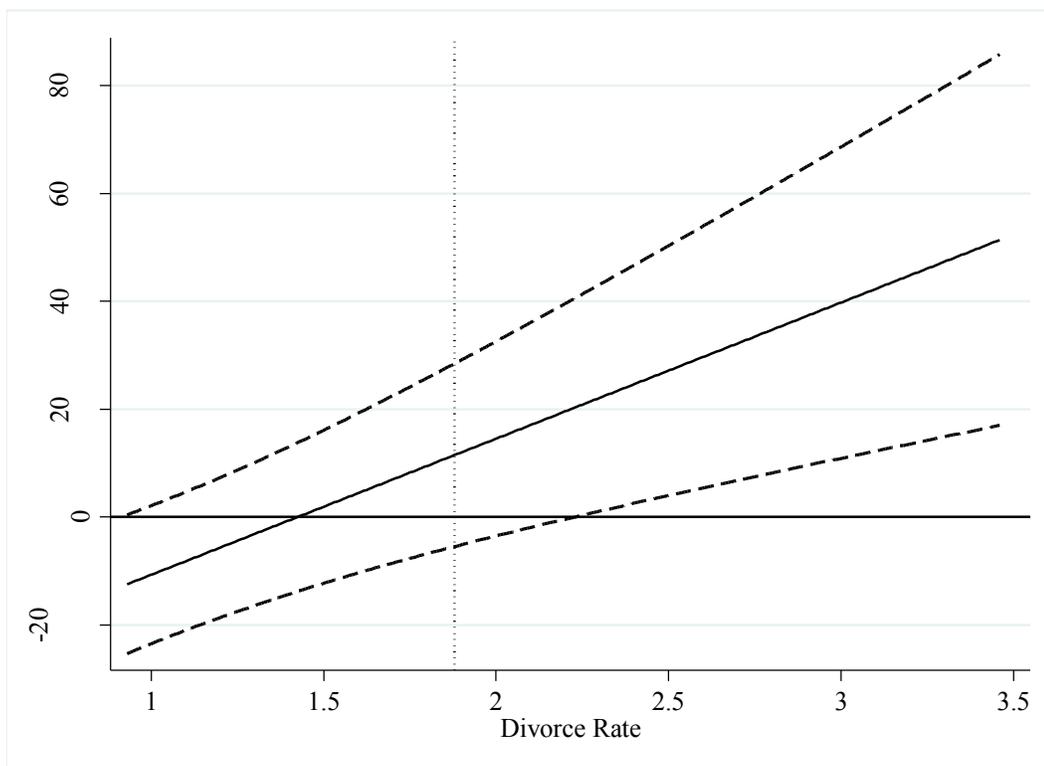**Marginal Effects of GDP on Suicide at Varying Levels of Divorce**
Regional Data (Full Model)

Table A9: Regional Homicide

	Model 22	Model 23	Model 24	Model 25	Model 26	Model 27	Model 28
Homicide							
GDP	-0.705	-1.618	-1.022	-1.964	-0.871	-3.290	-2.361
	(2.460)	(3.058)	(2.722)	(3.223)	(5.175)	(5.402)	(7.473)
Young Males	0.142	0.128	0.132	0.104	0.133	0.135	0.114
	(0.155)	(0.160)	(0.168)	(0.173)	(0.168)	(0.165)	(0.178)
Inequality	-0.010	-0.029	-0.014	-0.029	-0.026	-0.022	-0.031
	(0.022)	(0.031)	(0.029)	(0.033)	(0.030)	(0.033)	(0.035)
Divorce		-0.345		-0.387	0.011		0.177
		(0.355)		(0.385)	(2.072)		(2.109)
Public Health			-0.036	0.048		-0.667	-0.341
			(0.195)	(0.198)		(1.287)	(1.331)
GDP*Divorce					-0.406		-0.649
					(2.547)		(2.637)
GDP*Public Health						0.710	0.435
						(1.409)	(1.436)
Year	0.013	0.056	0.018	0.052	0.056	0.027	0.058
	(0.043)	(0.053)	(0.055)	(0.058)	(0.063)	(0.056)	(0.067)
Wald Chi^2	594.96	822.49	677.94	805.80	804.42	677.26	775.05
Obs	58	58	58	58	58	58	58

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

Table A10: Cross-National Suicide

	Model 29	Model 30	Model 31	Model 32	Model 33	Model 34	Model 35
Suicide							
GDP	-26.594*	-26.537**	-34.764*	-31.745**	5.118	34.914	33.681
	(11.745)	(8.941)	(14.303)	(10.939)	(17.678)	(24.797)	(20.017)
Elderly	1.379**	1.070**	1.164*	0.936*	0.907**	1.200**	0.885*
	(0.433)	(0.334)	(0.484)	(0.372)	(0.332)	(0.439)	(0.345)
Inequality	-0.057	0.049	-0.025	0.069	0.046	-0.071	0.030
	(0.217)	(0.166)	(0.219)	(0.168)	(0.160)	(0.199)	(0.149)
Divorce		5.430**		5.366**	16.467**		10.004
		(0.926)		(0.932)	(5.452)		(5.562)
Public Health			1.303	0.831		17.258**	12.889**
			(1.302)	(0.998)		(4.983)	(4.049)
GDP*Divorce					-13.910*		-6.249
					(6.778)		(6.888)
GDP*Public Health						-18.702**	-13.974**
						(5.675)	(4.679)
Constant	21.950	10.915	24.166	12.457	-11.940	-30.801	-38.000*
	(14.480)	(11.183)	(14.649)	(11.373)	(15.516)	(21.313)	(16.766)
Adj. R^2	0.238	0.558	0.238	0.555	0.588	0.375	0.654
Obs	50	50	50	50	50	50	50

*$p < .05$, **$p < .01$

Figure A14:
Marginal Effects of GDP on Suicide at Varying Levels of Divorce
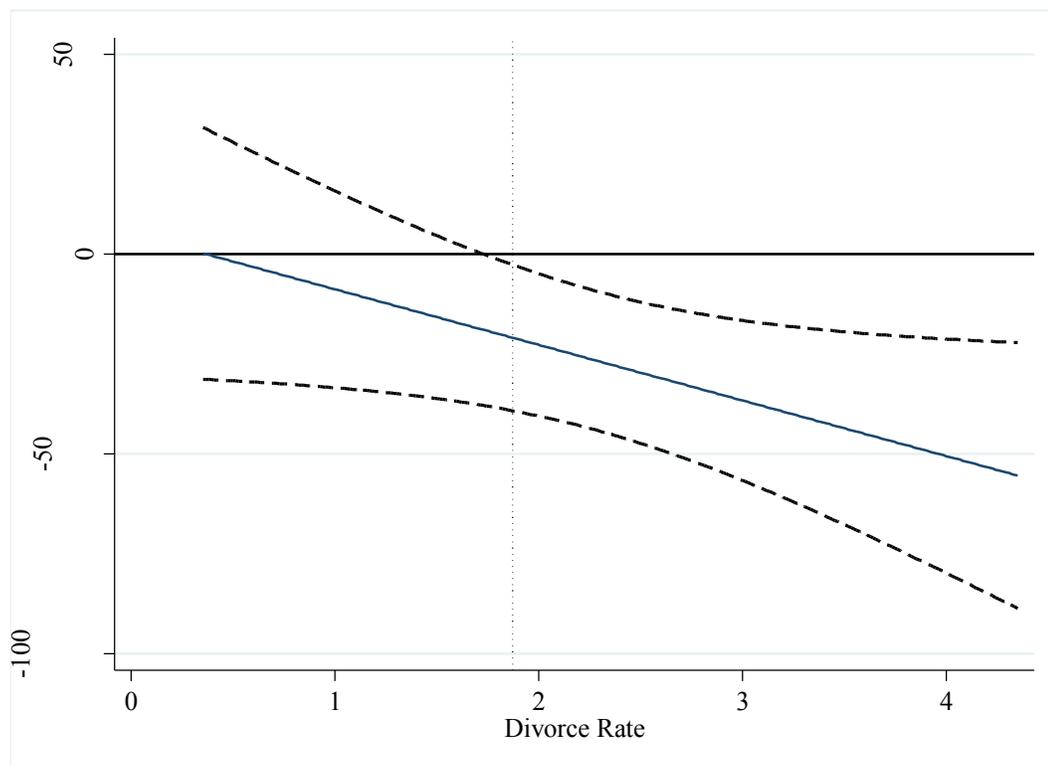**Cross-National Data**

Figure A15:
Marginal Effects of GDP on Suicide at Varying Levels of Public Health Spending
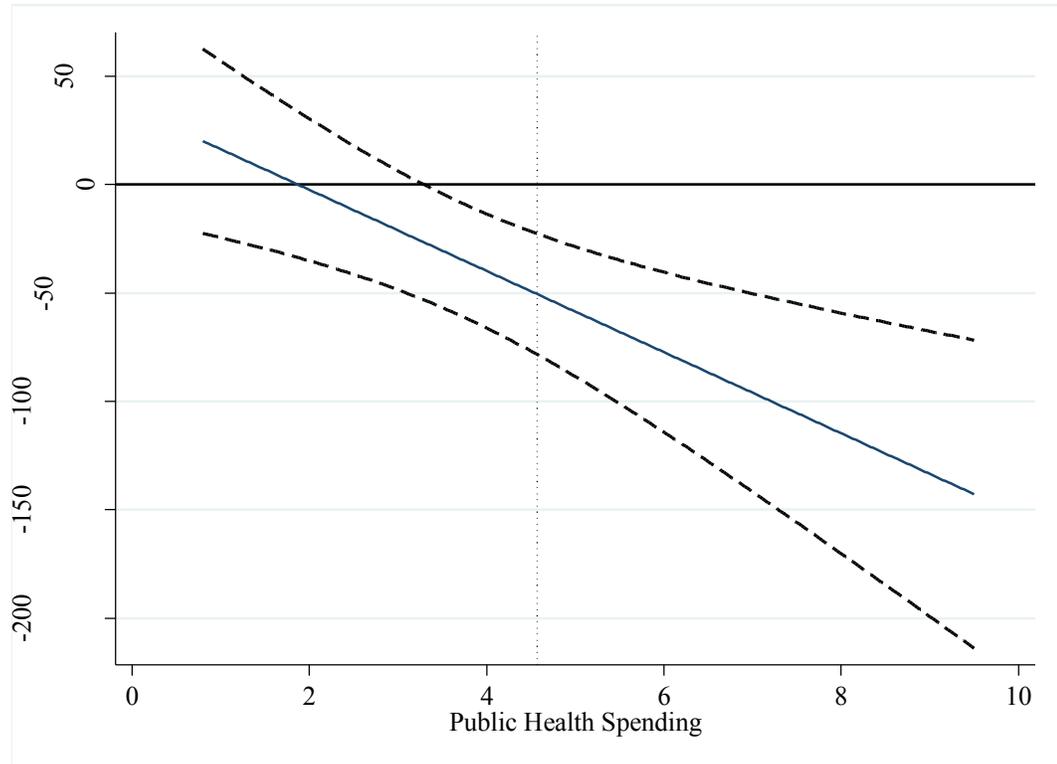**Cross-National Data**

Figure A16:
Marginal Effects of GDP on Suicide at Varying Levels of Public Health Spending
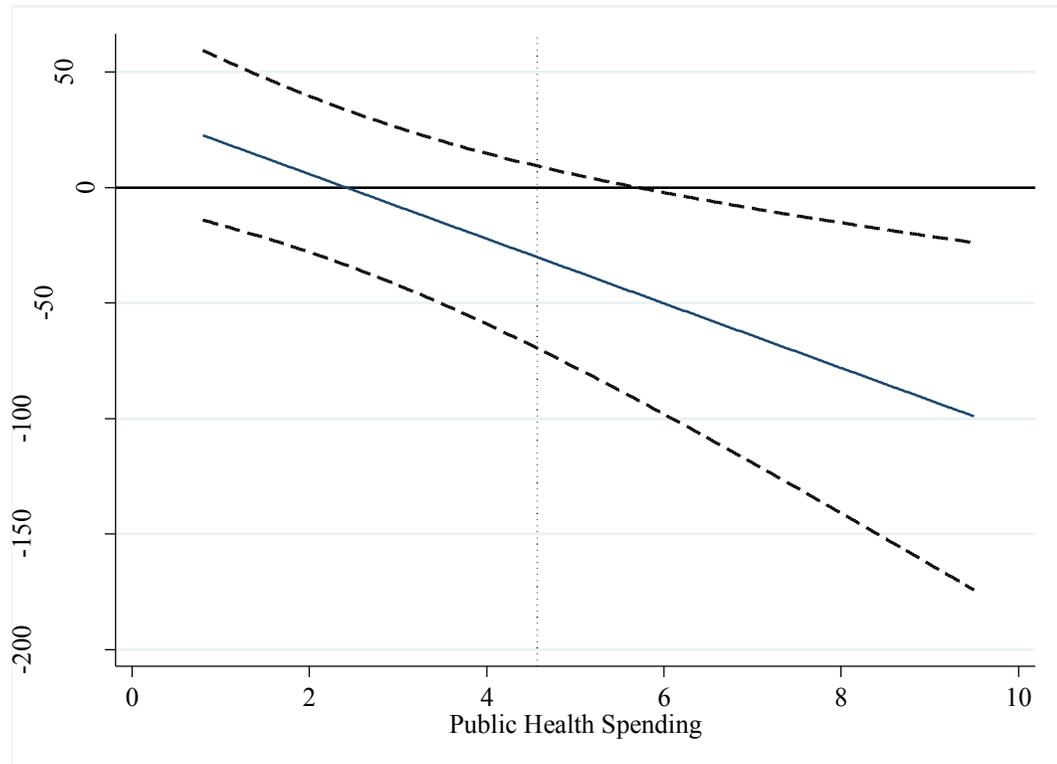**Cross-National Data (Full Model)**

Table A11: Cross-National Homicide

	Model 36	Model 37	Model 38	Model 39	Model 40	Model 41	Model 42
Homicide							
GDP	-16.786	-18.927*	-23.131*	-22.158*	1.270	15.246	14.855
	(8.559)	(7.835)	(10.748)	(9.882)	(17.097)	(20.087)	(20.659)
Young Males	-0.319	-0.361*	-0.273	-0.336	-0.047	-0.005	-0.147
	(0.195)	(0.178)	(0.200)	(0.185)	(0.322)	(0.355)	(0.356)
Inequality	0.581**	0.681**	0.647**	0.712**	0.673**	0.631**	0.676**
	(0.127)	(0.120)	(0.144)	(0.134)	(0.155)	(0.161)	(0.154)
Divorce		2.631**		2.556**	7.820		4.562
		(0.821)		(0.839)	(5.272)		(5.740)
Public Health			0.876	0.454		9.608*	7.633
			(0.897)	(0.836)		(4.037)	(4.179)
GDP*Divorce					-6.709		-2.921
					(6.555)		(7.109)
GDP*Public Health						-9.864*	-7.721
						(4.597)	(4.829)
Constant	5.425	-0.901	3.632	-1.650	-21.745	-32.610	-35.923*
	(11.137)	(10.349)	(11.294)	(10.522)	(15.006)	(17.265)	(17.303)
Adj. R^2	0.423	0.520	0.423	0.512	0.477	0.443	0.500
Obs	50	50	50	50	50	50	50

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

Figure A17:
Marginal Effects of GDP on Homicide at Varying Levels of Public Health Spending
Cross-National Data
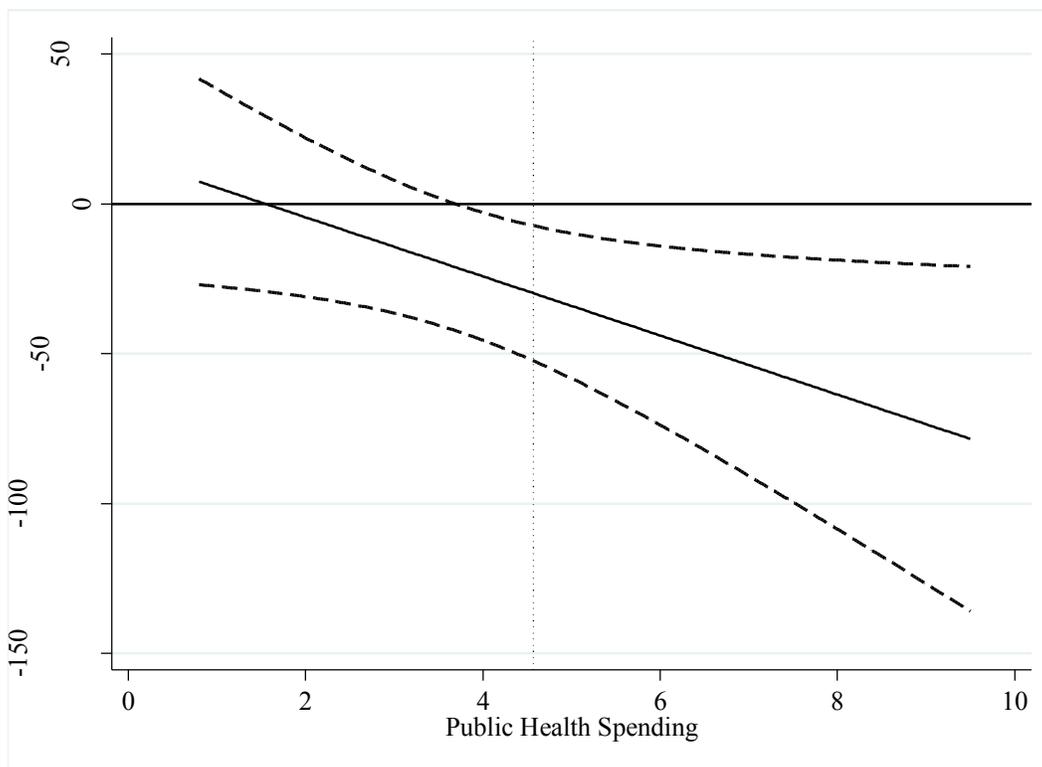
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