4-22-2010

The Effect of Economic Conditions, Gender Equality, and Women's Empowerment on Cross-National Trends in Rape

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B.A., Criminal Justice and Psychology, University of Illinois—Springfield, 2007

A Thesis Submitted to The Graduate School at the University of Missouri – St. Louis in partial fulfillment of the requirements for the degree
Master of Arts in Criminology and Criminal Justice

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Tables and Graphs

Tables

Graphs

Abstract

The purpose of the study is to examine changes in rape over time in the United States and Europe. Little previous research examines changes in rape trends over time, or compares rape trends across nations. I propose that economic conditions, gender equality, and empowerment of women can explain the changes in rape over time in the United States and Europe. To test this research question, a GLS cross-sectional time-series analysis was conducted of rape rates in the United States and thirteen European nations from 1990 to 2003. Results show that consumer confidence, unemployment, gender development, human development, and gender empowerment indices have significant relationships with rape. The effects of consumer confidence, unemployment, gender development, and human development on rape trends are somewhat sensitive to the inclusion of specific nations in the model. Nonetheless, the results suggest that cross-national research on rape trends is a promising area for future research.

Introduction

Can rape trends be examined at the cross-national level of analysis? Is it possible to get a reliable set of data to investigate differences between rape trends in the United States and Europe? These questions are not addressed by current literature in the field of criminology. To answer the questions, the starting point would be to examine rape trends at the national level for multiple nations.

Are the trends of rape in the United States and Europe similar? The rape trends for the United States and Europe are not the same.[1] The United States, Denmark Greece, Ireland, and Portugal have trends in rape that decline over the period. However, Austria, Denmark, Finland, Italy, the Netherlands, Portugal, Spain, Sweden and the United Kingdom all have rape trends that increase over the time period observed.

This is an interesting occurrence since during the 1990's the United States and Europe both had a decline in crime (Rosenfeld and Messner, 2009; Van Dijk, van Kestern, and Smit, 2007). The rape trends do not appear to follow the trends in other crime types for these nations from 1990 to 2003. What can explain why some nations observe a decline and others an increase in rape? Assuming that it is possible to explore cross-national rape trends, could the same variables explain the changes over time in rape for the nations that had an increase and those who had a decrease from 1990 to 2003 in rape victimization?

Methodological difficulties and lack of data have hindered researchers' ability to examine cross-national rape trends in the past. Difficulties such as definitional differences, national differences, mixed results on variables with only a single nation

[1] The rape trends of the United States and 13 European nations from 1990 to 2003 are graphed individually in Appendix A.

being examined all contribute to the lack of investigation. Data has largely been missing for this venture to be undertaken. Surveys like the International Crime Victimization Survey, often have large amounts of missing data for rape victimization over multiple nations. In addition, response rates typically are lower for rape victimization questions. The measurement of rape victimization is very complicated because it is a delicate subject. These difficulties can be overcome, and in the following thesis I take on the challenge of examining cross-national rape trends.

Despite the different trends in rape victimization cross-nationally it is possible to conduct an in depth exploration of rape trends cross-nationally. This is made possible by carefully selecting nations based on similarities in definitions of rape, controlling for differences in rape if possible, and testing the effect that any national differences may have on rape. The data can be pieced together from multiple sources, and the statistical procedure needed to analyze cross-sectional time series has become more popular in criminology in recent years.

In the first portion of the thesis, a discussion of the effect of economic conditions, gender equality, and women's empowerment on changes in rape over time in the United States and Europe begins with the exploration of previous literature on rape trends in the United States and Europe. The discussion expands to encompass theories of the effect of gender equality on rape. Two feminist theories are discussed, backlash and ameliorative theory. After a discussion of the mixed results supporting both theories, I propose two variables that might explain the paradoxical support for both theories found in literature. Research on the effect of economic conditions on crime and rape is explored. Finally, I propose that societies are a continuum of patriarchy and empowerment.

The next portion of the paper is the methodology section that includes an outline of the processes used to answer the research question: How do economic conditions, gender equality, and women's empowerment affect changes in rape trends over time in the United States and Europe? The sample and how the sample is gathered are discussed. Multiple sources of data are utilized because of the use of multiple nations. The sources, methodologies, and definitions for variables are provided in the data and methods section. The analysis section provides the results for the diagnostic tests that are conducted to test the model. After the discussion of the diagnostic tests, the generalized least squared cross-sectional time-series model is discussed. Following the analysis section, the multiple sensitivity tests used to further test the model are examined. Finally, the methodology section concludes with discussion of how missing data is handled.

The results section provides the findings for the generalized least squares cross-sectional time-series analysis with fixed effects for nation and time, and nation specific trends. The results of the GLS cross-sectional time-series analyses are included. The results section concludes with a discussion of the sensitivity test. The final sensitivity test is discussed nation by nation, as it excluded each nation one by one.

The discussion section includes a summary and explanation of results. The results section begins with a survey of the results. Results provided an answer to the research question, and the discussion expands on how empowerment affects gender equality and economic strain. Sensitivity tests provide a more complete understanding of the results in the original model. Implications for theory and further research are discussed.

Literature Review

Cross-National Rape Trends[2]

There exists little previous literature on cross-national rape trends. To date, three studies attempt to explain differences in international rape trends (Austin and Kim, 2000; McConahay and McConahay, 1977; Sanday, 1981). The first research on cross-national rape trends focused on cross-cultural anthropological differences in rape (McConahay and McConahay, 1977; Sanday, 1981). A more recent study discussed cross-national differences in rape for Western society (Austin and Kim, 2000).

McConahay and McConahay (1977) were the first researchers to begin theorizing about differing cultural explanations of rape. Using techniques discussed by Whiting and Child (1953), their work explored whether there is a correlation between sexual permissiveness and/or sex-role rigidity with violence across cultures. Two judges independently ranked sexual permissiveness in their sample of 17 nations, and another set of judges ranked the cultures' sex roles. They found that sex-role rigidity was highly correlated with violence across cultures. The effect of sex-role rigidity did not change even when specific forms of violence, such as rape, were excluded from the category of violence.

McConahay and McConahay (1977) did not directly test the effect of sex-role rigidity on rape, rather if sex-role rigidity would have an effect on violence with or without rape included. Sanday (1981) built upon McConahay and McConahay's (1977) study in searching for a cultural explanation of rape.[3] Sanday (1981) hypothesized differences in rape rates across cultures would be due to fundamental cultural differences.

[2] The word trend(s) indicates year to year changes in rape rates.
[3] Sanday (1981) examined cross-cultural rape trends using 186 of Murdock and White's (1969) cross-cultural sample of tribal societies. The data covered the time period from 1750 B.C. to the late 1960's.

She argued that a culture with higher rates of rape would differ from a nation with lower rates of rape in the level of male dominance in the culture. To test this hypothesis, Sanday (1981) used correlations of rape and ratings of male dominance for each culture. Two independent coders rated a culture's level of male dominance.[4] Cultures with higher levels of male dominance also had higher levels of rape, compared to cultures with lower levels of male dominance (Sanday, 1981). Sanday (1981) concluded that the fundamental differences in rape rates across cultures were most likely due to the level of male dominance in the cultures.

However, Sanday's (1981) study relied on bivariate analysis and could not control for other, related factors. Austin and Kim (2000) brought the study of cross-national rape trends to the developed Western nations. The authors tested the effect of gender equality on cross-national rape trends.[5] Austin and Kim (2000) improve on Sanday's (1981) study by operationalizing male dominance using the parliamentary seats held by women, percent of female administrators and managers, female education, and female labor force participation. Included as well in their analysis are measures of Gross Domestic Product (GDP), urban population, and the number of youth. They found positive relationships between rape, murder, and gender equality. The percentage of female administrators and managers, female education attainment, and the female labor force participation all had significant positive relationships with rape rates.

The previous literature exploring cross-national rape trends focuses on gender variables; gender role rigidity, male dominance, and gender equality. Results are

[4] On average, 88% of the ratings of male dominance were similar. When the coders disagreed on the ratings, the authors would discuss it with the coders and reach on consensus.

[5] Austin and Kim (2000) use the International Criminal Police Organization statistics for 1991 and 1992 for official reports of rape and murder.

indicative of gender equality having an important, yet unclear, role in understanding cross-national rape trends. Even today, the role that gender equality will play remains unclear because of the mixed results on the effect of gender equality on rape that support the two competing feminist theories of rape (Baron and Straus, 1984; Baron and Straus, 1989; Russell, 1975; Schwendinger and Schwendinger, 1983; Whaley, 2001; Whaley and Messner, 2002).

Gender Equality

The theories most often used to discuss rape victimization are feminist theories (Austin and Kim, 2000; Baron and Straus, 1984, 1989; Dobash and Dobash, 1992; Hunnicutt, 2009; Mooney, 1992; Russell, 1975; Straus, 1994; Whaley and Messner, 2002). Feminist scholars agree that violence against women research should be centered on gender social arrangements and power (Dobash & Dobash, Wilson, and Daly 1992, Mooney, 1992; Daly and Wilson, 1992; Yllo, 1993). There is discord among feminists as to what gender social arrangements, in terms of equality, create an environment that is conducive to female victimization. The theories I use to explain female rape victimization cross-nationally and conceptualize gender social arrangements are the "backlash theory" (Russell, 1981) and ameliorative theory (Whaley and Messner, 2002).

Backlash theory postulates that gender equality increases rape victimization of women (Baron and Straus, 1984; Russell, 1975; Williams and Holmes, 1981). Russell (1975) suggested that when gender disparities decrease because of rising levels of equality between the sexes, men are more likely to react to these changes in an attempt to assert dominance. The action often used is rape as a form of social control. Russell (1975) stated, "more threatened egos may mean more rapes" (p.14). As gender equality

increases, rape increases because females challenge men's masculinity and overall status in society (Baron and Straus, 1984). Men react to this challenge using rape as social control to put women back in their place.

Societal structure helps explain the positive effect of equality on rape. Messerschmidt (1993) suggested that as equality between the sexes increases, the importance of defining masculinity and perceived threats to men's collective interest is heightened. A patriarchal social structure creates conditions conducive to certain forms of crime, for instance rape (Messerschmidt, 1993, p.152). A patriarchal social structure would be a societal structure that creates male dominance (Hunnicutt, 2009). The achievement of hegemonic masculinity by men becomes increasingly important when structural changes (gender equality) create threats to men's status (Whaley, 2001).

The opposing theory to backlash theory is the ameliorative theory (Whaley and Messner, 2001). The ameliorative approach hypothesizes that gender equality decreases victimization of women (Straus, 1994; Whaley and Messner, 2002). When women have equal access to compete alongside men in the public sphere, mutual respect is created, which reduces the patriarchal nature of society (Messerschmidt, 1986). Over time the equal opportunities in the public sphere reduce the acceptability of rape (Martin, Vieraitis, and Britto, 2006).

Ellis and Beattie (1983) offer two propositions that explain the way in which equality lessens rape over time. The first is that deep-rooted social traditions of male domination in the sociopolitical and economic activities in society are the main cause of rape (Davis, 1975, Kemmer, 1977; Metzger, 1976). Due to the exclusion of women from the sociopolitical and economic activities in society, women are seen as unequal

(Herschberger, 1970; Metzger, 1976). Second, rape is the male behavioral response to social inequality (Ellis and Beattie, 1983). If women are allowed to participate in sociopolitical and economic activities of society, then they are perceived equal over time, and rape should decrease because social inequality is not present to create male behavioral response of rape.

The theories oppose each other both on the role of equality and patriarchy. It would seem that research on gender equality's effect on rape would settle the issues between the theories. There are just as many studies finding gender equality is positively correlated or increases with rape[6], as there are studies that gender equality is negatively correlated or decreases with rape.[7] The paradoxical nature of the theories is troubling. It is not possible for equality to both increase and decrease rape.

There are a few explanations for the differences in findings supporting the theories. The first possibility is that the studies supporting backlash approach are using different methods than those supporting the ameliorative approach. Yet, it seems as though the measurement of and definitions of rape across the studies are similar. Most studies use variables such as the gender pay gap, the enrollment rate for females in educational programs, parliamentary seats obtained by females, and women in the workforce (Bailey, 1999; Ellis& Beattie, 1983; Eschholz and Vieraitis, 2004; Straus and Baron, 1989; Whaley, 2001).

Another explanation is that there may be something missing from the theories, and that the theories are not as opposing as it would appear. The missing variable may

[6] For examples of support for Backlash theory see: Ellis & Beattie, 1983; Eschholz and Vieraitis, 2004; Linsky, Bachman, and Straus, 1995.
[7] For examples of support for the Ameliorative approach see: Bailey, 1999; Straus, 1994; Whaley, 2001.

change over time and cause the differences observed in the two theories. Previous research on the effect of gender equality and patriarchy on female homicide victimization obtained mixed results (Pridemore and Freilich, 2005). The paradoxical findings even for an outcome that is more accurately measured than rape requires some attention to the possibility a variable is missing. Pridemore and Freilich (2005) call for research to try and find the missing variable that could explain the contradictory findings of the effect of equality on female victimization. It may even be the fact that equality cannot explain rape, and that is why the findings are inconsistent across studies. However, before any of these statements can be made with confidence more research is needed outside of the effect of gender equality on rape trends.

Economic Conditions

The variable that may be missing from the theory may not be a variable commonly used by feminist scholars. One possibility that has been mentioned on occasion in research on rape is economic conditions (Baron and Straus, 1989; Raphael and Winter-Ember, 2001).

One of the first studies to examine the effect on economic conditions on changes in rape was the *Four Theories of Rape* (Baron and Straus, 1989). Baron and Straus (1989) hypothesized economic conditions are possible explanations for differences in rape rates at the state level. The Gini Index of Income Equality, social disorganization, and unemployment had a relationship with rape rates within states when tested using an ordinary least squares regression. Baron and Straus (1989) believed the relationship was likely due to a feeling of powerlessness among men, fostered by high unemployment rates within the community.

Raphael and Winter-Ebmer (2001) studied unemployment and its effect on various property crimes and violent crimes. When controlling for state specific trends, Raphael and Winter-Ember (2001) found a small significant relationship between violent crime and unemployment. However, when using a two-staged ordinary least squares model the relationship between violent crime and unemployment becomes clearer. Including state specific, linear and quadratic trends, the effect of unemployment on violent crime becomes significant. The effect of unemployment on rape becomes significant across all three specifications of the models (no state trend, state trends with linear trends, and state trends with linear and quadratic trends). This means even when difference between states is not controlled for or misspecification of the model is not controlled for, unemployment remains significantly related to rape across the United States.

The question becomes what explains the relationship between economic conditions and rape? I propose that the causal mechanism is Anomie and Strain as proposed by Merton (1938). Anomie, originally defined by Durkheim (1951), is a state of normlessness in modern society. Merton (1938) expanded on Durkheim (1951) to create the criminological theories of anomie and strain. Merton (1938) defined anomie as malintegration of valued cultural goals and the means used to achieve the goals, or the "cultural ends" (Merton, 1938, p.164). Anomie exists in modern society when the goals of society are stressed, but there is a disjunction between the means to achieve these goals and the ability of society to regulate the means to achieve goals. The goal that Merton (1938) stressed was economic success. In the United States, economic success is stressed

above all other goals. It is through this stress of the goal of economic success, and the lack of the means to achieve the goal, that anomie exists in society.

Strain theory is the micro-explanation of the macro theory of anomie. Individuals strive to achieve economic success despite a gap between goals and the ability to achieve the goals through legitimate means (Merton, 1938). Unable to legitimately achieve the goal of economic success, some might use other means, such as crime, to achieve economic success.

I propose the other means used to achieve economic success and lessen the threat of competition may be socially controlling the competition. Schwendinger and Schwendinger state "it is time to recognize that rape is distributed in our social structure in predictable ways and that sexual assault as well as other violent crime is influenced by political, economic, and ideological conditions" (1983, p.221). It may be because of economic strain, the disjuncture between goals and means to achieve economic success, that men rape women.

As backlash theory proposed, social control is the main purpose of rape (Russell, 1975). Men are threatened by women when women have higher levels of equality because women are better able to compete in the workforce and for other resources (Bailey, 1999). These resources and jobs become scarce during times of economic downturn. This creates competition between men and women and threatens men's status as well as their ability to achieve the economic goal of wealth. If women are just as likely to obtain jobs, funding for education, and other resources, they are a direct threat to men and achieving higher status through economic gain. The means to achieve the goal of economic success are threatened and diminished by competition between genders for

the same resources. Meanwhile, the goal of economic success is not changed; it is still fixed as the main source of measuring success. Men's ability to achieve the goal is diminished. As Merton's (1938) strain theory proposes, the disjunction between the goal and the actual ability to achieve goals leads to strain. Men who experience economic strain in societies with higher levels of equality may react to the economic strain through rape.

Marxist feminists describe how this strain can result in violence and theorize that capitalism and patriarchy are mutually reinforcing systems of domination (Jagger, 1983). The combination of patriarchy and capitalism creates the idea that men should be the "breadwinner" (Ehrenreich, 1976). It is not surprising that male perpetrators of violence against women tend to be of a lower socioeconomic status (Straus and Smith, 1990). In times of economic downturn, it is likely that more men are going to become disadvantaged and their status threatened by women. When men are unable to be the "bread winner", they may resort to an alternative way of socially controlling women.

Patriarchy versus Empowerment of Women

Changes in gender equality and economic strain may not be enough to explain changes in rape over time and cross-nationally. If equality is correlated with rape (Russell, 1975), and inequality is correlated with rape (Whaley and Messner, 2002), and both can help explain rape over time (Chaftez, 1990), then it is impossible to test the theory because no matter the result it is supported. What if the existing tests of theories of rape are leaving out a variable? There may still be one area that must be addressed: the effect of a patriarchal society versus a society that empowers women. Patriarchy is present in feminist theories, especially the theories used to explain rape.

Patriarchy plays a role in understanding why rape occurs. A patriarchal society is a society that establishes men in the dominant roles and subordinates women (Russell, 1975). It is through patriarchy that rape becomes acceptable. Whether it is because men are reacting to increasing threats to their social status in a society that is becoming less patriarchal or the subordination of women that makes it more acceptable to use rape as a form of social control, patriarchy has an effect on rape.

Patriarchy is often discussed in theories of rape, but it has been one of the most criticized concepts in the theories (Hunnicutt, 2009). It often does play a central role in theory, but is not operationalized in models. This is most likely caused by the inability to measure the level of patriarchy in society.

Another critique of the use of patriarchy in theories of violence against women is that the term patriarchy has taken to mean an unchanging and timeless structure that does not take into account the complex gender relations that exist (Beechy, 1979; Connell, 1990; Hunncuitt, 2009). Therefore, a theory of patriarchy needs to account for change across time and space. How can this be explained in the rigid understanding of patriarchal societies? As Hunnicutt (2009) suggests, perhaps the change in feminist theory that is the needed is the 'degrees of patriarchy" (p.559) or what I have described as a continuum of patriarchy.

Borrowing from post modernist theory, Hunnicutt (2009) argues patriarchal societies are not fixed and change over time and space. Bauman (2000) argues that patriarchal structures are much like the postmodernist idea of society. Society is forever changing and is fluid (Carrington, 1994). Therefore, patriarchal societies and structures are constantly evolving (Bauman, 2000). The evolution of society with increasing

equality between the genders creates a society that empowers women. The empowerment of women is slower to evolve than equality. However, as empowerment of women increases a society becomes less patriarchal. The missing cultural factor discussed in previous literature could be empowerment.

The "degrees of patriarchy" is the equivalent to the continuum of patriarchy and empowerment in societies. The evolution of society reflects the continuum of patriarchy and empowerment. The continuum explains variations in the use of rape and other forms of violence against women perpetrated by men. Some nations have relatively low rates of rape victimization, high levels of gender equality, and a downturn in the economy. I argue that that it is because these nations have higher levels of empowerment of women these nations have lower rates of rape. Empowerment moderates the relationship between economic strain and rape. Empowerment also may have more power in explaining the effect of gender equality on rape.

Empowerment is the decision-making power women have in society (Gender Empowerment Measure, 2007). It is the political and social aspect of society. If a society has high levels of empowerment, it may be that women are better able to affect society. Women would have seats in the government and have a voice in society because of economic power fostered through positions they hold within society and professional positions when levels of empowerment are increased. Women's empowerment would also give women a voice to mobilize against rape through official channels creating laws and making sure those laws are enforced. Voice is also gained socially through the networks women create in their day-to-day life. Empowerment creates the ability for

women to not be victims of social control, but also have the power to socially control men.

In nations with high levels of gender equality and economic strain (a downturn in the economy), where nations fall on the continuum of empowerment and patriarchy could explain the changes of rape over time. If a nation were closer to the empowerment side of the continuum, empowerment would moderate the relationship of strain and rape. Empowerment would lessen the effect of economic strain on rape in this instance. In addition, empowerment would moderate the effect of gender equality on rape. Therefore, the ability of gender equality to increase rape would diminish.

However, it is important to understand that empowerment and gender equality are two different constructs. I argue empowerment is slower to develop than equality. Empowerment is a perception held by individuals in society. Equality is created through laws. Laws such as the equal opportunity act and civil rights acts, create conditions that make equality come about. Just because a group is equal does not mean that these groups are empowered. Empowerment comes either with the ability to control other groups socially or through control groups through enforcement of the law.

Research Question

The purpose of this thesis is to investigate what effect gender equality, women's empowerment, and economic conditions have on changes in rape over time cross-nationally. This is an exploratory investigation of the revision of feminist theory of rape proposed in the literature review. It is important to start with testing whether there is an effect of economic conditions, gender equality, and women's empowerment on changes in rape over time. With little previous research on cross-national rape trends, it is

difficult to fully understand the differences in rape rates across nations. To begin better understanding rape trends, a study of cross-national rape trends and variables that may possibly affect rape is necessary.

Exploring cross-national rape trends is a contribution to the literature on rape trends because it allows for a better understanding of rape. By stepping back from looking at the effect of gender equality on a national study, I am able to get a broader picture of rape trends. Why is this important? Crime trends in the United States have long been studied to try to understand why there was a substantial decline observed during the 1990's (for discussion see Zimring, 2007). Researchers believed that the crime decline was only observed in the United States. European crime trends were similar to the United States crime trends, throughout the 1990's (van Dijk, van Kesteren and Smit, 2007). van Dijik et al (2007) concluded that the crime decline was universal and not just unique to the United States. If researchers had not stepped back to look at the entire picture, they would not have found that the crime decline occurred across multiple nations. Similarities in crime trends cross-nationally make it possible to narrow down possible causes of the decline. For a variable to explain declines in violent crime that occurred across nations, it must be able to explain across all the nations. Any variable that could not explain cross-national declines probably was not a major contributing factor in the crime decline.

As discussed in the introduction, the nations do not have similar rape trends. The sample of nations used have very different trends, some observed an increase in rape while other nations observed a decrease in rape. Taking a lesson from previous research on violent crime, it still is important to examine the differences in rape trends. Could the

same variables explain the increases and the decreases in rape cross-nationally? This question is important to answer, and is one of the contributions of this thesis.

Another contribution to the body of literature on rape victimization provided by this thesis is an operationalization of patriarchy. Feminist theories often use patriarchy to explain the role of gender equality in rape, but it is often not operationalized (Hunnicutt, 2009). However, it is possible to measure women's empowerment at the national level. Using the Gender Empowerment Measure (discussed further in the methodology) to operationalize the concept of patriarchy allows for a more complete test of feminist theory.

Data and Methods

Sample

Fourteen nations are included in the sample to test the effect that economic conditions, gender equality, and women's empowerment have on changes over time in rape in the United States and Europe. The European nations with the most available data are included in the sample. Nations with more than three missing years in a row, for any variable, are excluded. The sample is made up of the United States, Austria, Denmark, Germany, Finland, Greece, Hungary, Ireland, Italy, the Netherlands Poland, Portugal, Spain, Sweden and the United Kingdom.[8]

[8] The European nations included are not a representative sample of Europe, but they are a representative sample of the European Union. The nations are not a representative sample of Europe because the satellite nations of the former USSR are not included. Poland is the only nation included, and is not representative of most of the former communist nations. Eastern Europe is underrepresented because of lack of available data. However, the nations are representative of the European Union, who has yet to allow many of the former Eastern bloc nations into the Union. The European Union is becoming an important political force in the world, and therefore it is argued that it can serve as an adequate comparison to the United States (McCormick, 2007).

Outcome Variable

The outcome variable in the model is rape rates for each nation. Rape rates are the number of rapes reported to police per 100,000 total population. The rape rates from 1990 to 2003 are obtained from two sources: the European Sourcebook of Crime and Criminal Justice Statistics (ESCCJS) and the Uniform Crime Report (UCR). The ESCCJS is the source for the data on European rape rates and the UCR is the source of data for rape rates in the United States.

The ESCCJS is a source of data that provides statistics for 36 member nations (ESCCJS, 2006), including those countries that comprise part of this sample. The ESCCJS collects information from each nation through police reports. The rape rates are already calculated by the ESCCJS for all of the nations, except the United Kingdom. The United Kingdom rape rates are not given in one source; instead, the ESCCJS provides rape rates for England, Wales, Scotland, and Northern Ireland.[9]

The standard definition of rape applied by the ESCCJS is:

> sexual intercourse with a person against her/his will (per vagina or other entry). Where possible, the figures include: other than vaginal penetration (e.g. buggery), violent intra-marital intercourse, sexual intercourse without force with a helpless person, sexual intercourse with force with a minor, incestual sexual intercourse with or without force with a minor (ESCJS, 2006, p. 157).

The definitions of rape differ slightly by nation, depending on whether specific forms of sexual violence are included. The sourcebook includes a discussion of any

[9] To obtain the rape rates for the United Kingdom, I converted the rape rates back to the total number of offences. I gathered population data from the ESCCJS, which offers population data by year for each nation. To calculate the total offences, I divided the rates by 100,000 then multiplied that number by the total population for each year (rape rates/100,000*total population=total number of rape offences). The next step is to add together the three nations' total rape offences for each individual year. The population for each nation must also be added together for each year. Finally, the rape rates for the United Kingdom can be calculated using the sum total rape offences for each nation divided by the total population for each nation times 100,000 (total rape offences/total population *100,000).

deviations in the definition of rape for each nation. Tables in Appendix C provide the different categories included in the definitions of rape for each nation. Briefly, Finland and the Netherlands excluded incestual rape with or without force from the definition of rape. Germany does not differentiate between sex with a minor and incest rape. Greece does not include intra-marital intercourse without the use of force. The United Kingdom measures differ for each nation; Scotland excludes other than vaginal penetration, sexual intercourse with a helpless person, and sexual intercourse with a minor without force and, Northern Ireland excludes intra-marital rape, other than vaginal penetration, and sexual intercourse with a helpless person.

United States rape rates are obtained from the UCR. Since 1930, the Federal Bureau of Investigations has compiled the UCR yearly (Federal Bureau of Investigations (b), 2009). Approximately 17,000 law enforcement agencies report monthly crime statistics to the FBI. Annually, the FBI compiles the Crime in the United States Report that provides annual crime statistics for the United States for both violent and property crimes.

The Federal Bureau of Investigations provides rape rates in the form of the number of rape offenses per 100,000 in the population.[10] These can be obtained from the Federal Bureau of Investigation website (Federal Bureau of Investigations, 2009a). For the purpose of this paper, I obtained the rape rates for each year from the Crime in the

[10] A common limitation cited with the use of UCR rape data is that many rape victims do not report their victimization to police. I compared the UCR rape rates from 1990 to 2003 from the National Crime Victimization Survey (NCVS). The NCVS uses self-report data to measure rape. It has been argued that self-report data is better at capturing rape victimization (Rennison and Rand, 2007). The correlation between rape rates reported in the UCR to those in the NCVS from 1990 to 2003 is 0.96. The correlation is strong and positive. This means that as rape rates in the UCR increased those in the NCVS increased. The strong correlation suggests that the UCR and the NCVS are both able to capture around the same rates of rape from 1990 to 2003 and similar trends.

United States reports from 1990 to 2003 (Federal Bureau of Investigations, 2009a).[11] The definition of forcible rape used by the UCR is "the carnal knowledge of a female forcibly and against her will" (Federal Bureau of Investigations, 2009b, p.19). Carnal knowledge is defined as "the act of a man having sexual bodily connections with a woman; force as forcible regard-sexual intercourse" (Federal Bureau of Investigations, 2009b, p.19). "Against her will" is defined as:

> Instances in which the victim is incapable of giving consent because of her temporary or permanent mental or physical incapacity (or because of her youth). The ability of the victim to give consent must be a professional determination by the law enforcement agency. The age of the victim, of course, plays a critical role in this determination (Federal Bureau of Investigations, 2009b, p.19).

The effect of the definitional difference between nations on the model is difficult to ascertain. The ESCCJS does not offer separate statistics for each of the type of sexual violence included in the definition nor does the United States. It could be that the definitional differences affect the overall model. Multiple steps are taken to limit the effect of the differences in definitions between the United States and European nations, as well as within the European nations. The first method is to limit the sample to nations with the most similar definitions of rape. After a careful study of the ESCCJS and UCR methodological notes on the definitions of rape utilized, I carefully selected nations with the closest definitions of rape. The next steps are statistical methods to help limit and understand the differences in definitions of rape have on the overall model. First, I include nation and time fixed effects, and nations specific trends. By including these

[11]The UCR use police counts of crimes submitted to the FBI as the source for the incident rates. Not all police agencies report to the FBI crime counts, nor do all agencies accurately report crime to the FBI. Moreover, the UCR excludes any state that does not conform to the definition of rape. For instance, Illinois rape counts are excluded from the UCR each year because Illinois includes male rape victims in the definition of rape, whereas the UCR does not count rape for men (Federal Bureau of Investigations, 2009b).

trends, I can begin to understand the effect that the differences in definition have on the model. I also use systematic exclusion of each nation from the model. By excluding each nation from the model, one at a time, I can understand each nation's effect on the overall model. If a nation's definition of rape were different enough to affect the significance level of any of the variables, the exclusion of that nation would tease out the effect.

Economic Conditions

Economic conditions are measured using consumer confidence (CC), gross domestic product per capita in constant US dollars (GDP), and unemployment. There are multiple sources for each data set because multiple nations are under investigation. Economic conditions are used to measure the theoretical concept strain. When economic conditions are poor, GDP and CC are low, and unemployment is high, economic strain may be present.

Consumer confidence has been used in previous literature to test the effect of economic conditions on various crime types (Rosenfeld and Fornango, 2007; Rosenfeld and Messner, 2009). The previous literature found support for an effect of consumer confidence on various crime types. Specifically, in cross-national comparisons of burglary, consumer confidence and lagged consumer confidence were found to have an effect on cross-national trends in burglary. The other measures of economic conditions (unemployment and GDP) were found to not have an effect on the cross-national trends of burglary. It may be that the subjective measure of economic conditions has more effect on crime because it is a perception of people. Official measures have to be obtained from sources other than the person, and at times are difficult to understand.

People may rely more on their own perceptions of their economic status than on official objective measures. I include consumer confidence as a subjective measure of economic conditions.

Consumer confidence is acquired from two different sources: Survey of Consumers (US) and Eurostat (European nations). Consumer confidence estimates perceptions of the population's financial and general economic standings for the next year (Survey of Consumers, 2009). While the two surveys, Survey of Consumers and Eurostat, are not identical in the method used to measure consumer confidence, they are similar enough to allow for comparisons (Curtin, 2007). Moreover, the efficacy in the surveys in predicting economic variables has been supported by multiple tests. However, there are differences between nations that are not explained by sampling, wording of questions or index construction (Curtin, 2007). The methodologies for both are further discussed below.

The Index of Consumer Sentiment (ICS) is derived from the Survey of Consumers. The Survey of Consumers is a rotating panel sample that is conducted every month by the University of Michigan. The sample consists of approximately 500 telephone interviews of adults. Random digital dialing is used to collect a sample each month. However, this does leave out individuals who do not own a landline telephone. The survey covers three core areas of consumer sentiment: personal finances, business conditions and buying conditions. The questionnaire includes 26 questions, with sub questions based on the respondents' answers to the questions.[12]

[12] In order to create the Index of Consumer Sentiment, five questions are used (see appendix E for the questions). The relative score of each question is summed and then divided by the base period created in 1966, which is 6.7558. The next step is to add 2 to the total of the answers received from dividing the

The European equivalent (see Appendix E for complete information on both the ICS and CCI) of the Index of Consumer Sentiment is the Consumer Confidence Indicator (CCI). The CCI is similar to the ICS in that it attempts to measure individuals' perceptions of the current economic conditions in their respective nation. The CCI is a monthly survey of households in various European Union nations. European Union member nations are sampled each month using a stratified sample. Around 32,800 respondents per nation are asked to participate in the survey each month. Much like the ICS, the CCI questions respondents about their financial status now and where they believe their financial status will be in 12 months (Eurostat, 2009).

To make the data from the US and the European nations more comparable, the annualized version of the data is calculated, and then standardized. Since the data are collected monthly, the annualized version is calculated. This is done by averaging the 12 months together (January from December). Moreover, because the Consumer Confidence Indicator and the Consumer Sentiment Index do not have similar scales, I standardize through converting the measures to Z scores.

The next measure used to quantify economic conditions is unemployment. Unemployment has been used in previous research to test the effect of strain (poor economic conditions) on various crime types. Cantor and Land (1985) used unemployment to evaluate the effect of economic strain on crime in the United States. Results were promising for the utility of unemployment in measuring strain.

To be sure all forms of possible strain are included in the model, I also include unemployment as a measurement of economic conditions. Unemployment rates come

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relative scores by the base period. The two is added to correct for a change in the survey in 1950. The answer received is the index of consumer sentiment (University of Michigan, 2009).

from three sources, the United States Bureau of Labor Statistics (2009), Eurostat (2009), and LABORSTA (2009). The Bureau of Labor Statistics collects the number of individuals in the labor force who are unemployed every month in the US. The information is collected by interviewing a sample of 6,000 households in the United States every month. Interviews are conducted in person and over the telephone. The unemployed are defined as individuals over the age of 16 who are unemployed and have actively been seeking work for the prior 4 weeks before being interviewed (Bureau of Labor Statistics, 2009). The measurement utilized for this study is the percent of the population unemployed.

The European equivalent information is derived from Eurostat (2009) and LABORSTA (2009).[13] The methodology of the unemployment statistics in Europe is similar to that of the United States. The main differences are in the age range in that the European measurement includes individuals age 15 to 74, whereas the US includes individuals 16 and older. To reach an annual unemployment rate for both the European nations and the United States, the yearly average is calculated. The yearly averages of unemployment rates for the nations are used in the model.

The final measure, GDP is included in the model because of questions raised about the efficacy of using unemployment as a measure of economic conditions, and strain. Arvanites' and Defina (2006) discussed the issues of using unemployment as a measure of economic conditions. Unemployment measures only people who are actively seeking work. Often individuals stop looking for work actively, and are not included in

[13] Two sources were used to obtain data for the unemployment rate to allow for complete data for each nation. Due to the model used, discussed below, complete data is important. By obtaining more complete data for unemployment rates in Europe, I am able to prevent having to utilize regression based imputation over multiple years.

the unemployment measure (Arvanites' and Defina, 2006). In addition, unemployment does have slight differences between the nations, specifically the age levels. To examine the effect of the differences, I include GDP as a measure of cross-national economic conditions.

GDP is an indicator of the standard of living in a given nation. For each nation the amount of goods and services produced in a given time period are calculated. The data are collected from the Organization for Economic Co-Operation and Development (OECD) (2009). The OECD collects data for all nations that are a part of the cooperation. All of the 15 nations are a part of the cooperation and the OECD had complete data for GDP for each nation. The OECD provides the already calculated GDP per Capita in constant US dollars.

Measuring Gender Equality

In addition to the economic variables, I also include a measure of gender equality not previously used in research. The Gender-Related Development Index (GDI) measures the level of equality between men and women (2007). Gender equality is a measure of the level of equality between women and men across different nations. A higher score on the gender equality index means the nations has higher levels of gender equality.

Three dimensions are included as ratios of females to males: life expectancy at birth for males versus females, knowledge measured using adult literacy and the school enrollment ratio for males and females, and the standard of living for males and females. More information on the calculation of the GDI is available in Appendix F along with the

goalposts that are included in the calculation.[14] To obtain GDI measures for each nation, the Human Development Reports from 1996-2006 are used. There is a three-year delay in the reporting of the GDI. Therefore, 1993 GDI measures for each nation are reported in the 1996 Human Development Report.

Measuring Women's Empowerment

The final predictor variable included is the Gender Empowerment Measure (GEM, 2007). GEM measures women's decision-making power in society in the political and economical realms. This measure is used to measure the continuum of patriarchy and empowerment. By measuring the empowerment of women in society, it is possible to estimate the position of a nation on the continuum of patriarchy and empowerment. A higher score on the GEM means that women are more empowered in that nation.

Three dimensions are included in measuring the GEM. Political participation and decision making power in the political realm is measured by using the percentage of men and women that hold seats in the legislature/parliamentary. Economic participation and the power to make economic decisions are measured using two indicators. The first indicator, the political participation, is the share of positions in the legislature, senior officials and management positions for men and women. The second is the percentage of men and women who hold professional and technical positions. The final dimension is the estimated earned income for males versus females in US dollars. More information on the calculation of GEM is provided in the Appendix F along with the goalposts that

[14] Goalposts are the ideal level that the country should reach for each of the variables included in the calculation. The goalposts are established by the United Nations as standards for ideal levels for each variable for each nation. .

are included in the calculation. To obtain GEM measures for each nation the Human Development Reports from 1996-2006 are used. There is a three-year delay in the reporting of the GEM. Therefore, 1993 GEM measures for each nation are reported in the 1996 Human Development Report (2007).

Control Variables

Five variables are included as control variables. All of the control variables were collected from the Census Bureau for the United States (1990-2003), Eurostat (2009), United Nations Human Development Report (United Nations (a), 1993-2006), and United Nations Demographic Yearbook (United Nations (b), 1990-2003).

Previous literature has established that the population most at risk for rape victimization ranges between age 15 to 24 (Tjaden and Thoennes, 2006). In addition to the at risk population, the age crime curve states that as individuals age, they age out of crime. Younger individuals are more likely to be involved in criminal activity than older individuals (Gottfredson and Hirschi, 1990). To control for both the at risk population for victimization and perpetration, I include the percent of the population aged 15 to 24. These data are gathered from the Census Bureau for the United States and Eurostat for the European nations.

I also include the percentage of individuals age 50 or older. Nations that have large numbers of individuals age 50 and older may have lower rates of rape victimization due to the small number of rape victimizations that occur for people age 50 and older (Tjaden and Thoennes, 2006) Individuals age 50 and older are also less likely to be perpetrators (Gottfredson and Hirschi, 1990). It is necessary to control for this age group as well so that nations with larger populations of individuals ages 50 and older do not

skew the results. The data for this measurement are gathered from the Census Bureau, for the United States; and Eurostat, for Europe.

Another control included is the sex ratio for each nation. The sex ratio, the number of males per 100 females, is included to control for sex differences. Nations with larger populations of men compared to females may bias the results since there are more motivated offenders. These data are gathered from the Census Bureau for the United States (United States Census Bureau,1990-2003), and Eurostat for the European nation (2009).

The Human Development Index (HDI) measures the developmental level of nations (United Nations, 2006).[15] The HDI measures differences in the level of development in a nation. The index includes measurements of life expectancy, educational attainment and income to create a composite score that is the HDI. Appendix F provides an explanation of how the HDI is calculated. It is important to control for different developmental levels between the nations because nations that are less developed may have higher rape rates over time. The HDI is obtained from the UN Human Development reports from 1996-2006.

The final measurement included is the crude marriage rate, which is the number of marriages each year per 100,000 total population. These data are collected from the United Nations Demographic Yearbook for the United States and Eurostat for European nations. The crude marriage rate is included to control for the findings in previous literature that married women are less likely to be rape victims compared to single

[15] The HDI and the GDI are similar but not the same and do have some overlap in measures. The GDI captures specifically gender equality differences. Moreover, there is an overlap in the measurement of GDP in this and the GDP used to quantify an objective measure of cross-national economic conditions.

women (Tjaden and Thoennes, 2006). Nations may have different levels of married women that could cause differences in the rape rates over time.

Analysis

To examine the effect that economic conditions and women's status have on rape trends in the United States and Europe, I use a pooled time series analysis. The pooled cross-sectional time series analysis is the best fit because the data used are cross-sectional data collected from multiple sources. The standard error created from pooling the cross-sectional data to create a pseudo longitudinal data set requires special treatment to control for the standard errors (Sayrs, 1989).

With the inclusion of multiple nations, it allows for more degrees of freedom to allow for nation and time fixed effects in the model. This is done by creating dummy variables for each nation and time period, with one nation and time period as reference categories. Including fixed effects of nations and time periods controls for between-nations differences that are not explained by the variables in the model, as well as changes over time that could not be explained by the model. In addition to including fixed effects for time and nation, an interaction of time and nation is included. The interaction allows for a nation-specific trend. This alleviates the differences between nations that cannot be explained by variables in the model. One of these differences could be definitional differences of rape that inflate or deflate rape rates in various nations. Linear and quadratic trends are included to help control for any variables that were not included in the model that could also explain cross-national rape trends.

Diagnostic tests

The model is first tested for stationarity using the Dickey-Fuller test. In order to do this, each nation is selected one by one, via dummy variables, and that nation's rape rates are tested using the Dickey-Fuller test. The Dickey-Fuller test results are not stationary for most nations. The results are available in Appendix D. After first differencing rape, the Dickey-Fuller test is conducted again.[16] The second Dickey-Fuller test on the first differenced rape rates for each nation resulted in most nation rape rates becoming stationary, except for the United States, Sweden, and the United Kingdom .

The Cook-Weisberg test for heteroskedasticity was also conducted. An ordinary least squares regression model was run using rape as the outcome and all of the other variables as either independent or control variables. The Cook-Weisberg test failed to reject the null hypothesis, therefore, heteroskedisticy is an issue [$\chi^2(1)=11.42$, $p=0.00$]. Due to the presence of heteroskedasticity, a generalized least squares estimation assuming heteroskedaticity, with nation and time fixed effects and nation specific trends, is utilized to estimate the model (Sayrs, 1989).

The final diagnostic test conducted was the Prais-Winsten test for autocorrelation, using the Prais-Winsten command in STATA. The Prais-Winsten command provides two tests for autocorrelation: the Prais-Winsten statistic, rho; and the Durbin-Watson statistic**.** Both the Prais-Winsten and the Durbin-Watson statistic showed that autocorrelation is not influencing the overall model (rho=0.040, Durbin-Watson-1.832). The GLS model does not need to control for autocorrelation within or between the panels.

[16] First differencing is done by taking year2-year1. For instance, the rape data for the United States would be first differenced by taking the rape rates from 1991 minus 1990, and so on.

Sensitivity Tests

Sensitivity tests are conducted to aid in understanding the effects of economics and gender on rape in the United States and Europe. The sensitivity tests are used to explore the model in depth. The first sensitivity test is the exclusion of the fixed effects and nation specific trend to attempt to see the effect these have on the overall model. The second sensitivity test explores the effect of nonsignificant variables. Including extraneous variables could lessen the significance level of the significant variables and lower the model fit. To investigate this, non-significant variables in the model are excluded. The third sensitivity test explores the effect each nation has on the model. Some nations may be outliers that are biasing the results of the overall model. Economic conditions, gender equality and women's empowerment may explain rape in some nations and not others. To test this, a systematic exclusion of each nation from the model one by one is utilized to see if any nation is driving any results that may be found. When the nations are systematically excluded, if the variables from the original analysis remain significant, then it is likely not due to definitional differences or national differences not controlled for in the model.

Missing Data

Missing data is an issue with time series models. The variables rape, unemployment, HDI, GDI, and GEM all have missing data points in varying years (see table 1).[17] With the type of model that is used for analysis, it is important that missing data are limited. The Generalized Least Squares time-series model typically uses a case

[17] If data were missing from any of the overlapping years and appeared in one of the other publications, then the publication in which the rape rate appears first is used. For instance, if data was missing from 1996 in the first publication, but was present in the second, the second publications rape rates are utilized.

wise deletion of missing data. This means that for each year there is a missing data point, the model will delete that year from the overall sample. The total N of the model would be 104, after first differencing to control for stationarity. That is a relatively low sample for time series estimation. Regression-based imputation or multiple imputations using a regression equation is utilized to impute the missing data points.[18] In appendix D, the descriptive statistics before and after multiple imputation are made available.[19] Regression based imputation was first introduced by Rubin (1987) as a way to impute missing data. Multiple imputation is an equation that predicts missing data using other variables in the data set. Predicted distributions are used as substitutions for the missing data points (Allison, 2001). This is done several times, 20 in this study, creating multiple data sets with different missing variables imputed for each dataset. The data sets are analyzed using "Rubin's Rules" which averages the multiple imputations to create a single coefficient (Rubin, 1987). The method is attractive because not only does it create unbiased coefficients, it also takes into account the errors around the imputations. The standard error is the average of the standard errors of each imputation (Schafer, 1999).

[18] The reason regression based imputation is used, and not interpolation, is due to the nature of the missing data. Regression based imputation does not include as many assumptions as interpolation, as discussed above. In addition, data are missing at the beginning of the series, and over multiple years. Interpolation would further bias the data because it is unable to take into account the missingness at the beginning of the time frame.

[19] STATA 11 has a program included in the software that allows multiple imputations to be conducted. Linear regression based imputation is used for this model. The equation used included GDP, sex ratio, percent 15 to 24, percent 50 and older, and the crude marriage rate as predictors for the imputation. Due to missing data in rape, it was not used as a predictor.

Table 1: Missing data, variable country and year.

Rape[20]	Spain, 1996
	Portugal, 1990-1992
Consumer Confidence	Poland, 1990-1992
HDI	All Nations, 1990-1992, 1996
GDI	All Nations, 1990-1992, 1996
GEM	All Nations, 1990-1992, 1996

Results

As discussed above, the rape trends of the fourteen nations in the sample were not always similar. The United States, Greece, Ireland, Portugal, and Denmark all had a decline in rape from 1990-2003. Austria, Germany, Finland, Italy, the Netherlands, Poland, Spain, Sweden and the United Kingdom all had an increase in rape from 1990 to 2003. Despite these differences, could the same variables explain the cross-national rape trends? To begin to examine this, the mean and standard deviation for each nation's rape rates from 1990-2003 are presented in table 2. By starting with the means and standard deviations of each nation, a clear picture of the data can be obtained before answering the question.

[20] Debates about the utility of imputing missing data for an outcome variable have resulted in mixed answers. With only four missing points out of the 196 total data points, it is within reason to impute the missing data points for the outcome variable, rape. Losing two nations over a few missing data points, in the already limited sample, would further limit the model.

Table 2: Descriptive statistics for each nation for Rape rates from 1990-2003

	Mean	SD
United States	36.61	4.06
Austria	10.86	2.98
Denmark	9.04	0.90
Germany	8.63	1.17
Finland	8.85	1.46
Greece	2.19	0.29
Ireland	10.57	8.18
Italy	2.64	1.28
the Netherlands	9.91	0.82
Poland	9.91	0.82
Portugal	5.91	0.65
Spain	4.64	0.86
Sweden	4.33	1.20
the United Kingdom	21.40	3.44

The United Kingdom and the United States have the highest average rape rate, while Italy has the lowest average of rape. Ireland has the highest standard deviation for all nations. Therefore, there is further need to examine the effect Ireland has on the overall model.

In table 3, the correlations, means and standard deviations for the model (including all nations) and each variable are presented. The variables are first differenced to make them stationary. The correlations between the predictor variables and control variables for rape were nonsignificant. This is not surprising because as discussed earlier, rape rates in the United States were decreasing from 1990 to 2003, however, the European rape rates were increasing.

Table 3: Correlations, means, and standard deviations. (N=168).

	1	2	3	4	5	6	7	8	9	10	11
1. Rape	-										
2. Consumer Confidence	-0.036	-									
3. Unemployment	0.032	0.132	-								
4. GDP	0.014	-0.028	**-0.666**	-							
5. HDI	-0.054	-0.016	-0.012	-0.018	-						
6. GDI	-0.057	0.046	0.027	0.042	**0.256**	-					
7. GEM	-0.105	0.024	0.041	0.039	0.0.34	**0.187**	-				
8. Sex Ratio	0.039	0.008	-0.037	0.064	-0.015	-0.078	0.004	-			
9. Percent 15 to 24	0.066	-0.028	0.084	0.048	0.012	-0.108	-0.017	-0.028	-		
10. Percent 50 plus	0.011	0.039	0.034	-0.018	0.077	-0.078	0.182	-0.038	0.007	-	
11. Crude Marriage	-0.030	0.082	-0.119	0.228	-0.056	-0.014	-0.078	-0.034	0.0304	-0.006	-
Mean	-0.685	0.223	0.019	540.539	0.003	0.004	0.017	0.127	-0.046	0.230	-0.177
SD	1.118	0.831	0.443	446.692	0.157	0.014	0.038	0.123	0.203	0.278	0.242

Note. All variables first differenced. Bold print equals $p<0.05$.

Significant relationships also exist among other variables. Gross Domestic Product per Capita in constant US dollars (GDP) had a significant negative relationship with unemployment. Therefore, as unemployment increased, Gross Domestic Product decreased. The Gender Equality Index and Human Development Index have a significant positive relationship. Therefore, as GDI increased, HDI also increases. The Gender Empowerment Measure GEM) and Gender-Related Development Index (GDI) have a significant positive relationship. As GEM increases, GDI also increases.

Table 4 presents results from the GLS model with time and nation fixed effects and a nation specific trend. As expected, economic conditions, gender equality, and women's empowerment all have an effect on changes in rape rates over time in the United States and Europe (see table 4 for results of GLS model). In addition, the level of nation development, as measured by the human development index, has an effect on rape in the United States and Europe.

The economic conditions that affect rape in the United States and Europe are contemporaneous consumer confidence and unemployment. Contemporaneous consumer confidence has a negative relationship with rape rates ($b=-0.152$, $p=0.002$). Unemployment has a positive relationship with rape in the United States and Europe ($b=0.124$, $p=0.017$).

Table 4: Effect of economic conditions, gender equality and women's empowerment on year-to-year changes of rape rates in the United States and Europe, 1990-2003.

	Coef	*SE*	*Z*
Standardized Consumer Confidence	-0.1523*	0.4892	-3.11
Lagged Consumer Confidence	-0.0151	0.0481	-0.31
Unemployment	0.1239*	0.0519	2.39
GDP per Capita in Constant $US	0.0005	0.0029	1.77
Human Development Index	-10.4050*	4.5037	-2.31
Gender Development Index	21.0897*	4.5047	3.30
Gender Empowerment Index	-4.5136*	0.9664	-4.67
Sex Ratio	-0.7365	0.5916	-1.24
Percent 15 to 24	0.1225	0.4442	0.28
Percent 50+	0.1747	0.1513	1.16
Crude Marriage Rate	-0.4933	0.3250	-1.52

Note. GLS model, nation fixed effects, year effects, nation specific trend. All variables first differenced. N=168 and the Wald χ^2=926.11, p=0.000. Nations = United States, Austria, Denmark, Germany, Finland, Greece, Ireland, Italy, the Netherlands, Poland, Portugal, Spain, Sweden, and the United Kingdom.
*p<0.05

These findings are similar to previous findings for other crime types as well as rape. Rosenfeld and Messner (2009) found significant results for a relationship between consumer confidence and burglary in a cross-national sample of European nations and the United States. However, unlike previous research, in these models the lagged consumer confidence does not have a significant effect on rape trends. Therefore, the model implies that there is an immediate effect present between consumer confidence and rape trends. Consumer confidence as a subjective measure of the economic conditions may have an immediate effect on rape trends because negative perceptions of economic conditions could result in economic strain. Economic strain may create conditions that make rape more likely.

Also consistent with previous literature is the finding for unemployment. Raphael and Winter-Ember (2001) and Baron and Straus (1989) found significant results for the effect of unemployment on rape trends in the United States. The significant positive relationship from the GLS cross-sectional time-series model further supports these

findings and extends the support for an effect of unemployment on rape to the cross-national level. This could also support a possible relationship between economic strain, as measured by high unemployment rates, and an increase in rape.

The gender equality results support the backlash theory. Russell (1979) proposed that there is a positive correlation between gender equality and rape. Gender equality, measured by the GDI, has a positive relationship with rape (b=21.0897, p=0.001). As gender equality increases, rape rates in the United States and Europe increase.

The gender empowerment measure, operationalized by the GEM, has a negative relationship with rape (b=-4.5136, p=0.000). In the United States and Europe, as women's empowerment increases rape rates decrease from 1990 to 2003. While this is not a direct test of the hypothesis that women's empowerment moderates the effect of strain on rape, it does provide promising results to support the need for further research using GEM as a measurement in models testing feminist theory.

Finally, the level of human development has a negative relationship with rape trends in the United States and Europe (b= -0.405, p=0.021). As a nation becomes more developed, the rate of rape decreases. The finding is not surprising because the model includes highly developed nations that have very little variation in development between them.

Sensitivity Analysis

There are observable differences between the sensitivity test that excludes the nation and time fixed effects and the nation specific trends (see table 5). Excluding these effects causes the model to become weaker as measured by the Wald $\chi 2$. The Wald $\chi 2$ decreases but remains significant. This supports the idea that nation and time effects and

trends are an important factor in the model. Lagged consumer confidence, GDP, sex ratio, and percent 50 plus all become significant in the model without the fixed effects or trends included. All of the significant variables increase in magnitude.

Table 5: Sensitivity test excluding nation and time fixed effects and nation specific trend.

	Coef	SE	Z
Consumer Confidence	-0.138*	0.039	-3.50
Consumer Confidence (-1)	-0.131*	0.040	-3.23
Unemployment	0.132*	0.032	4.07
GDP	0.001*	0.000	3.66
HDI	-14.659*	2.691	-5.45
GDI	18.332*	4.385	4.18
GEM	-3.767*	0.948	-3.97
Sex Ratio	0.378	0.338	1.12
Percent 15 to 24	0.317*	0.130	2.44
Percent 50 plus	0.190	0.119	1.60
Crude Marriage	-0.141	0.104	-1.35
N	168		
Wald $\chi 2$	90.440		

Note. Generalized least squares model testing the effect of economic conditions and gender on rape trends in the United States and Europe. *$p<0.05$

The second sensitivity analysis, the exclusion of nonsignificant variables, did create differences in the model. In table 6, the results of this test are presented. There are changes in the model in terms of magnitude and significance. For instance, consumer confidence, HDI and GDI all lose significance when the nonsignificant variables are excluded. This is indicative of a relationship that is mediated by some other factor. This means that some other variable, when not controlled for, causes the significance and magnitude of the variables to change.

Table 6: Second sensitivity test excluding nonsignficant variables.

	Coef	SE	Z
Consumer Confidence	-0.087	0.06	-1.49
Unemployment	0.142*	0.03	4.89
HDI	2.381	2.95	0.81
GDI	1.696	4.98	0.34
GEM	-2.458*	0.83	-2.97
N	182		
Wald $\chi 2$	6681.73*		

Note. GLS model, nation fixed effects, year effects, nation specific trend. All variables first differenced*$p<0.05$

The final sensitivity test excluded each nation from the model one by one to examine the overall effect each nation had on the model. Results for the sensitivity test are provided in tables 7 and 8. There are some differences when nations are excluded. When Austria and Italy are excluded from the model, consumer confidence in the contemporary form loses significance. Excluding Ireland, the Netherlands and Poland causes unemployment to lose significance. Equality loses significance when the Netherlands and Ireland are excluded from the model. Despite these slight changes, the overall results are still strong. The fact that the variables still remain significant across a majority of the nations is strong support for the variables' ability to explain cross-national rape trends. However, gender empowerment remains significant no matter what nation is included in the model. This means that gender empowerment's ability to explain rape cross-nationally is quite robust. The use of gender empowerment to examine cross-national rape trends is promising for future research.

Table 7: Sensitivity test 3, the systematic exclusion of each nation from the model.

	US	Austria	Denmark	Germany	Finland	Greece	Ireland
Consumer	**-3.14**	-0.08	**-4.18**	**-3.98**	**-3.17**	**-2.34**	**-4.61**
Confid	**(0.05)**	(0.06)	**(0.03)**	**(0.025)**	**(0.05)**	**(0.06)**	**(0.04)**
Consumer	-0.30	-0.21	**-2.20**	-1.71	-1.31	-0.51	0.48
Confid (-1)	(0.04)	(0.06)	**(0.04)**	(0.03)	(0.05)	(0.06)	(0.04)
Unemployment	**2.41**	**2.30**	**3.21**	**5.10**	**3.32**	**2.39**	1.73
	(0.06)	**(0.06)**	**(0.04)**	**(0.04)**	**(0.05)**	**(0.07)**	(0.04)
GDP	**2.91**	**2.82**	**3.36**	**5.81**	1.53	**3.11**	-0.55
	(0.00)	**(0.00)**	**(0.00)**	**(0.00)**	(0.00)	**(0.00)**	(0.00)
HDI	1.30	1.16	-1.58	-1.20	-2.10	-1.64	-1.97
	(4.66)	(3.92)	(4.35)	(4.65)	(4.40)	(4.01)	(2.57)
GDI	**3.90**	**2.21**	**5.32**	**4.54**	**3.42**	**2.92**	1.60
	(6.79)	**(7.21)**	**(4.28)**	**(4.11)**	**(6.63)**	**(6.54)**	(4.15)
GEM	**-5.32**	**-2.96**	**-5.00**	**-2.64**	**-4.87**	**-3.21**	**-2.59**
	(0.99)	**(1.17)**	**(0.91)**	**(1.01)**	**(0.97)**	**(1.20)**	**(0.50)**
Sex Ratio	-0.32	-1.93	-1.00	-0.43	1.28	-0.24	-1.10
	(0.67)	(0.76)	(0.62)	(0.65)	(0.61)	(0.87)	(0.44)
Age15 to 24	1.49	**2.99**	1.91	1.87	0.03	**3.76**	0.00
	(0.42)	**(0.37)**	(0.39)	(9.44)	(0.49)	**(0.34)**	(0.16)
Age50+	1.25	0.43	1.44	0.92	0.98	0.06	-0.44
	(0.17)	(0.18)	(0.15)	(0.16)	(0.15)	(0.19)	(0.13)
Crude	-1.98	0.04	-1.69	-3.50	**-2.04**	**-4.30**	-1.29
Marriage	(0.19)	(0.36)	(0.24)	(0.17)	**(0.28)**	**(0.30)**	(0.05)
N	156	156	156	156	156	156	156
Wald χ^2	**4379.27**	**17798.94**	**2495.83**	**11289.19**	**1345.27**	**6036.71**	**3000884.80**

Note: Column titles of nations are the nations excluded. Therefore, United State is the results for the exclusion of the United States from the model.
bold= p<0.05.

Table 8: Sensitivity test 3, the systematic exclusion of each nation from the model

	Italy	Netherlands	Poland	Portugal	Spain	Sweden	UK
Consumer	-0.70	**-2.00**	**-3.17**	**-3.04**	**-3.82**	**-2.59**	**-2.74**
Confid	(0.48)	**(0.05)**	**(0.05)**	**(0.05)**	**(0.0544)**	**(0.06)**	**(0.05)**
Lagged	-0.96	-0.45	0.03	-0.90	-0.88	-1.04	-0.13
Consumer	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.06)	(0.05)
Confid (-1)							
Unemployment	**3.45**	-0.45	1.14	**2.11**	**4.24**	**2.87**	0.82
	(0.05)	(0.05)	(0.09)	**(0.05)**	**(0.06)**	**(0.06)**	(0.09)
GDP	**4.39**	**3.25**	**1.95**	1.91	**3.37**	**2.40**	1.52
	(0.00)	**(0.06)**	**(0.00)**	(0.00)	**(0.00)**	**(0.00)**	(0.00)
HDI	-1.80	1.65	-1.14	**-2.23**	-1.66	-1.83	-1.35
	(3.50)	(0.00)	(6.00)	**(4.51)**	(3.97)	(4.64)	(5.70)
GDI	**2.26**	1.11	**2.97**	**3.30**	**3.30**	**2.89**	**2.92**
	(5.00)	(7.38)	**(6.60)**	**(6.28)**	**(6.72)**	**(7.16)**	**(6.61)**
GEM	**-2.23**	**-4.16**	**-4.38**	**-4.54**	**-5.39**	**-4.94**	**-4.31**
	(1.74)	**(1.02)**	**(1.04)**	**(0.096)**	**(0.94)**	**(1.08)**	**(1.06)**
Sex Ratio	-1.84	-1.63	-0.65	-1.12	-0.47	-1.33	-0.65
	(0.69)	(0.76)	(0.82)	(0.59)	(0.63)	(0.73)	(0.81)
Age15 to 24	**4.38**	**3.78**	0.41	0.21	**3.87**	1.05	0.04
	(0.37)	**(0.30)**	(0.44)	(0.44)	**(0.35)**	(0.42)	(0.41)
Age50+	0.89	0.88	1.42	1.32	0.57	-1.04	1.08
	(0.15)	(0.16)	(0.17)	(0.15)	(0.16)	(0.39)	(0.18)
Crude	-2.92	**-3.08**	**-1.95**	-1.40	-1.71	**-2.28**	0.06
Marriage	(0.25)	**(0.15)**	**(0.17)**	(0.33)	(0.33)	**(0.16)**	(0.16)
N	156	156	156	156	156	156	156
Wald χ^2	**18615.18**	**2714.27**	**333822.00**	**1046.77**	**8430.70**	**22652.26**	**8621.58**

Note: Column titles of nations are the nations excluded. Therefore, Italy is the results for the exclusion of Italy from the model. ***bold= p<0.05***

The differences in the significance level could be explained by nation specific causes, or simply by the fact that the sample size decreases when a nation is excluded from the model. The decrease in sample size could cause variables to lose significance. Further research is needed to understand why the variables change when some nations are excluded.

Discussion

The research question posed earlier in the paper is what effect do economic conditions, gender equality, and women's empowerment have on cross-national rape trends over time? A GLS cross-sectional time-series analysis with fixed effects for time and nation, as well as a nation specific trend, suggested that, despite different trends amongst the nations included in the sample, changes in rape over time can partly be explained by changes in economic conditions, gender equality, and women's empowerment of women in the United States and Europe.

Economic conditions have an effect on rape trends across nations. As economic conditions deteriorate, rape increases in both the United States and Europe. I attribute the relationship to strain. When economic conditions within a nation are deteriorating, people begin to have difficulties achieving economic success. This difficulty results in strain, as Merton (1938) discussed. Interestingly, the relationship between economic conditions and rape does not change for subjective or objective measures of economic conditions. Unemployment, an objective measure of the economy, and consumer confidence, a subjective measure of the economy, both had significant results. Consumer confidence and rape have a negative relationship. Therefore, the negative relationship between consumer confidence and rape suggest that in times of high consumer

confidence levels rape appears to decrease. Moreover, unemployment and rape had a significant positive relationship. The positive relationship between unemployment and rape suggests that in times of high rates of unemployment rape appears to increase as well.

This is consistent with previous literature on the effect of economic conditions and crime, as well as economic conditions and the effect they have on rape. In recent years, economic conditions, including unemployment and consumer confidence, have been used to explain the crime decline in the United States (Zimring, 2007) as well as in Europe (Rosenfeld and Messner, 2009). Researchers often do not focus on the effect of economic conditions on rape. While most research has examined the pay gap between men and women as an operationalization of gender inequality (Baron and Straus, 1984; Whaley and Messner, 2002), this is not a specific test of economic conditions. The work by Baron and Straus (1989) is one of the first pieces to explore the relationship between the economy and rape. My results are congruent with what Baron and Straus (1989) and Raphael and Winter-Ember (2001) found; unemployment has a positive relationship with rape in the United States and Europe.

Consumer confidence also had a significant negative relationship with rape. This is consistent with the research that examines the effect of consumer confidence with other crime types (Rosenfeld and Messner, 2009). One of the conclusions drawn from the results of this thesis is that strain, lower levels of consumer confidence, could be an explanation of rape rates across time.

With the increasing equality between men and women, it puts men and women in direct competition for the same positions. The competition between men and women

could be seen to impede on men's ability to achieve economic success If men and women are truly in competition for scarce resources, such as jobs, in times of anomie, then equality should have a positive relationship with rape across nations over time. The GLS cross-series time-series model with fixed effects for nation and time, and nation specific trends supported this assertion. Equality, measured by the gender development index (GDI) has a positive relationship with rape. This is consistent with backlash theory that proposes equality results in higher rates of rape because men use rape as a form of social control (Russell, 1975). Social control is used to keep women in their place because, as equality increases between the sexes, men's masculinity and statuses are challenged by females (Baron and Straus, 1984). A direct test of the proposed relationship will be conducted in future studies.

Perhaps the challenge to men's status becomes even more evident during times of anomie and economic strain. As discussed earlier, the competition for scarce resources, jobs and competition within careers increases during times of economic strain. Unemployment increases and the economic wellbeing of families is questionable during times of downturns in the economy. Unemployment is able to capture the increase in competition for fewer jobs in the market. More unemployed people results in more people applying for the same jobs. Since people are being laid off and fired more often, as measured by increases in unemployment, there are fewer jobs available in the job market. This creates conditions where there are more people applying for the same scarce jobs and a lack of social control (Cantor and Land, 1985).

If women are equally able to obtain these jobs and promotions within careers, they threaten the overall status of men, in a society that is more patriarchal. Therefore, in

nations with higher rates of equality between the sexes, and higher levels of empowerment of women, rape rates should be less. The results are consistent with this statement. Equality is positively related to rape, while empowerment has a negative relationship with rape. Moreover, economic conditions have a negative relationship with rape. Therefore, when economic conditions are poor (anomie and economic strain are present), gender equality is high, and empowerment is low rape increases.

From these results, it appears empowerment may be an important variable in understanding the effect of equality on changes in rape over time in the United States and Europe. Empowerment, used to measure the decision making power of women in society, has a relationship with rape. This relationship does not appear during the original correlation matrix including all of the nations. Nor does it appear in nation-by-nation correlation matrixes (Appendix B). However, before this conclusion is fully supported, more research is needed to understand the part empowerment plays in the relationship between equality and rape.

One way to further examine the significant relationships of economic conditions, equality, and empowerment is to conduct multiple sensitivity tests. Three sensitivity tests were conducted to understand the relationships. The first sensitivity test excluded the nation and time fixed effects and nation specific trends to see how these effects worked in the model. It becomes apparent that the fixed effects and nation specific trends were needed in the model. Without the fixed effects and nation specific trend, most variables are significant. Therefore, there are nation specific and time specific effects and trends that have to be controlled for using these methods.

The second sensitivity test excluded all nonsignificant variables from the model to examine their effect on the overall model. Excluding variables from the model did create different results. Without specific variables in the model, consumer confidence, HDI and GDI all lost significance. Consumer confidence, HDI, and GDI all have relationships with other variables in the model that help make them significant.

The final sensitivity test and the most important because it can establish the effect of the different definitions of rape for each nation, is the systematic exclusion of each nation from the model. Some changes occurred, but further research is needed to fully understand why the models differ slightly by nation. Despite the changes, most of the significant measures including consumer confidence, unemployment, GDI, HDI and GEM all remain relatively stable across all nations. Most important is the robustness of GEM. The GEM remains statistically significant across all nations. This is an important powerful finding that will require more research in the future.

Limitations

There are limitations to the study, as there are in any study. One of the most substantial limitations is the definitional differences of rape across nations. The definitions of rape for each nation have been provided above in the discussion of the methodologies of the ESCCJS and UCR (see Appendix C for complete definitions for European nations). However, I have attempted to address this potential limitation in two ways. The first method is to include fixed effects for time and nation and nation-specific trends. These effects and trend help control for national differences that may occur. In addition, by systematically excluding each nation in the final sensitivity test, I was able to test what effect each nation has on the overall model. It appeared that slight changes

occurred in the model from nation to nation, but at this point it is difficult to state that these changes were caused by definitional differences in rape across nations.

Another limitation of the study is the sample size. Only 14 nations, 13 European nations, are included in the sample. Europe is much larger and variation between the nations is large. The sample does not adequately capture all of Europe because the Eastern block nations are excluded from the sample. In addition, the United States does not adequately capture the difference within the United States. Essentially, the United States is made up of 51 different penal systems. The measures used to capture rape rates reflect this. As discussed in the methodology, the Uniform Crime Report (UCR) excludes states because of refusal to match the UCR definition.

Addition to the sample being small, the range of years used to measure changes in rape over time is small. The time from 1990 to 2003 may capture a different trend than a different grouping of years. This is much like the crime decline in the United States, and coincidentally the years used are the same as the years a crime decline in the United States occurs. If crime in the United States were only studied from 1990 to 2003, it would appear the United States had a steady decline in crime. However, if crime were studied from 1970 to 2006 a very different story would be found. Therefore, the years used may not capture the larger story of the effect of economic conditions, gender equality, and empowerment of women on changes in rape over time.

The final limitation is the use of police data. Police data only capture reports made to the police. There are many instances where rape victimization is not reported to the police (Baumer, Felson, and Messner, 2003). The model is therefore testing the police reported rape victimization and the effects that economic conditions, gender

equality and empowerment have on them. Victimization data for international samples is difficult to obtain, and often is not reliable, with small sample sizes, and missing data for multiple nations and multiple years.

Implications

The study is one of the first of its kind to examine cross-national rape rates and the effect economic conditions, gender equality, and women's empowerment have on changes in rape over time. Other studies have examined cross-national rape rates and equality, but none before has examined economic conditions and empowerment. The results support the theory that economic conditions have effects on rape rates over time. While the relationship depends on the measure of economic conditions and the nations included in the model, the results are still promising and suggest the need for future research.

I suggested earlier that the mixed results on the effect of gender equality on changes in rape might be caused by the exclusion of empowerment from the models. Empowerment, different from equality, may be the key to understanding why equality has different effects on rape. Gender empowerment and gender equality are two different measures. Empowerment is decision making power, while equality is created by the law. Empowerment is more of a perception people hold; it is how people perceive each other. Power is created when people perceive a person having power. It is not a tangible thing. However, equality can be created and enforced through the laws. Equality is still a perception and people can be equal and discriminated against, but laws can be created to stop that discrimination. However, empowerment cannot be created via law. It is slower to develop and is a mindset.

The overall model supported this. To empower women, they must be given more decision power within society. The more decision making power women have, the less likely rape will occur in society. Even if the revision of feminist theory earlier is not correct, the effect of women's empowerment is still important. The ability to measure patriarchy via GEM is an addition to feminist theory that should continue to be tested. It may be a key to understanding the mixed results because the quantification of gender equality does vary across studies and the measurement may be a key to understanding the different effects found for gender equality.

These findings are a precursor to testing the revision of feminist theory I discussed. The results support the theory that economic conditions, gender equality, and women's empowerment have an effect on rape trends. However, there is still work to be done. The theory itself must be tested to see if the moderating effects of women's empowerment on strain and rape exist. Despite the need for more research, the results of this thesis support the idea that gender empowerment may be the key to understanding changes in rape over time in the United States and Europe.

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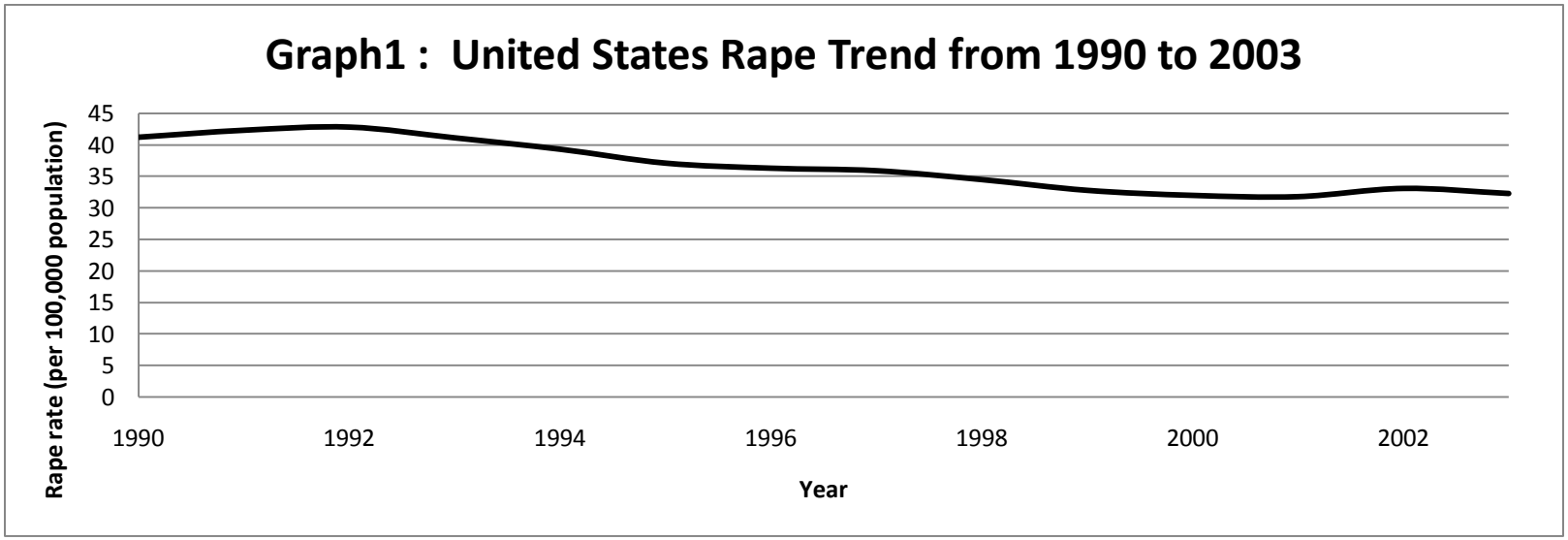
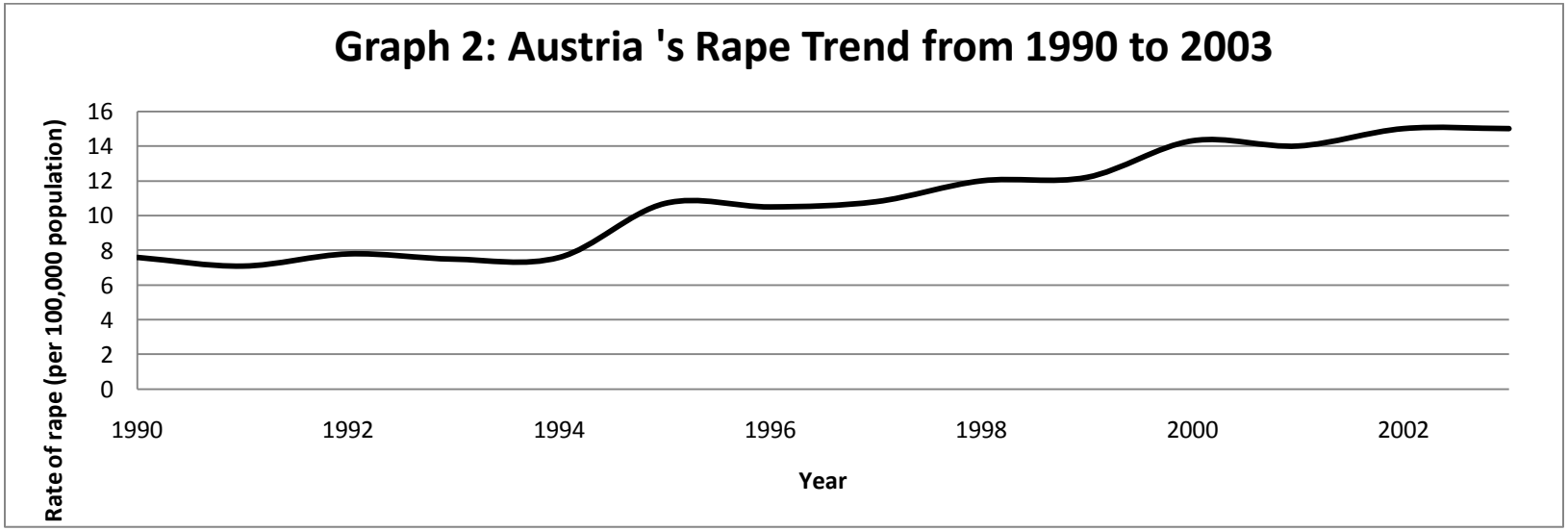
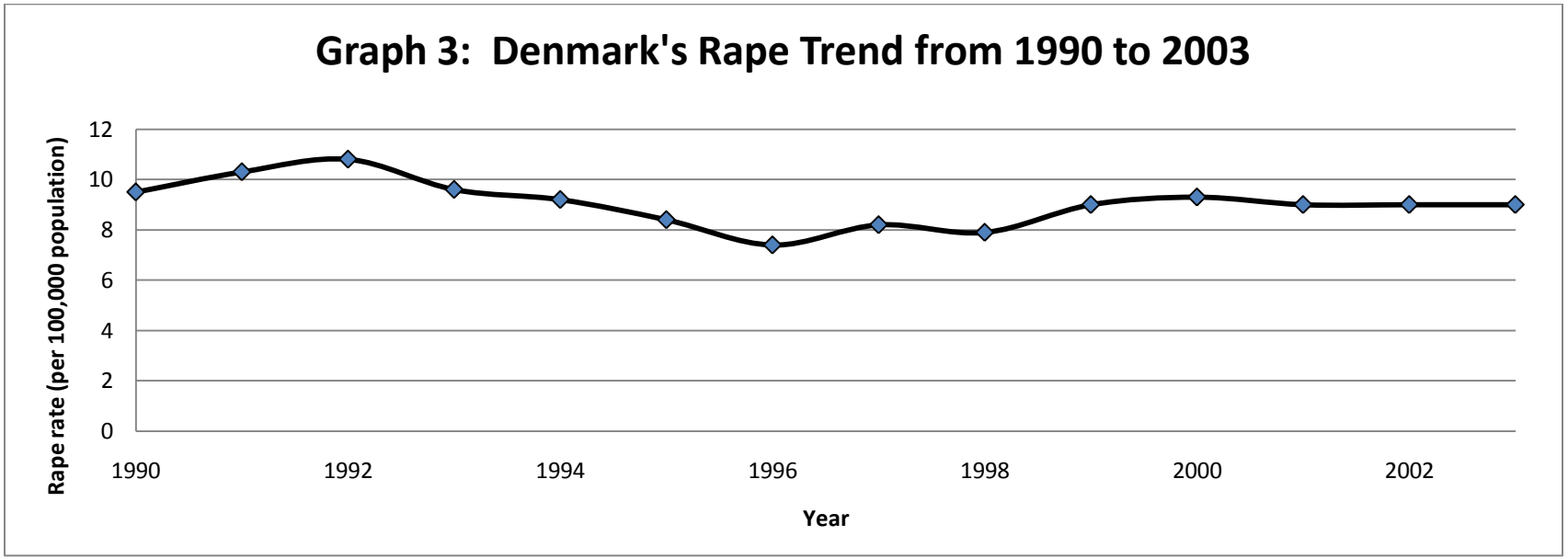
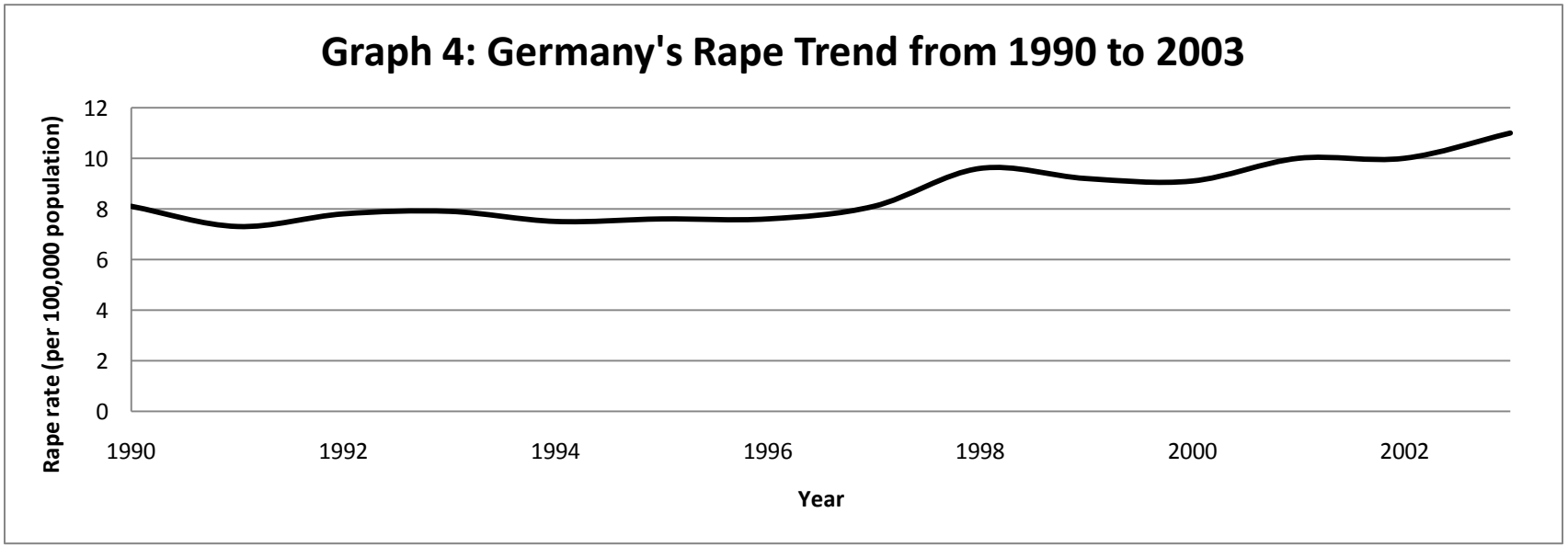
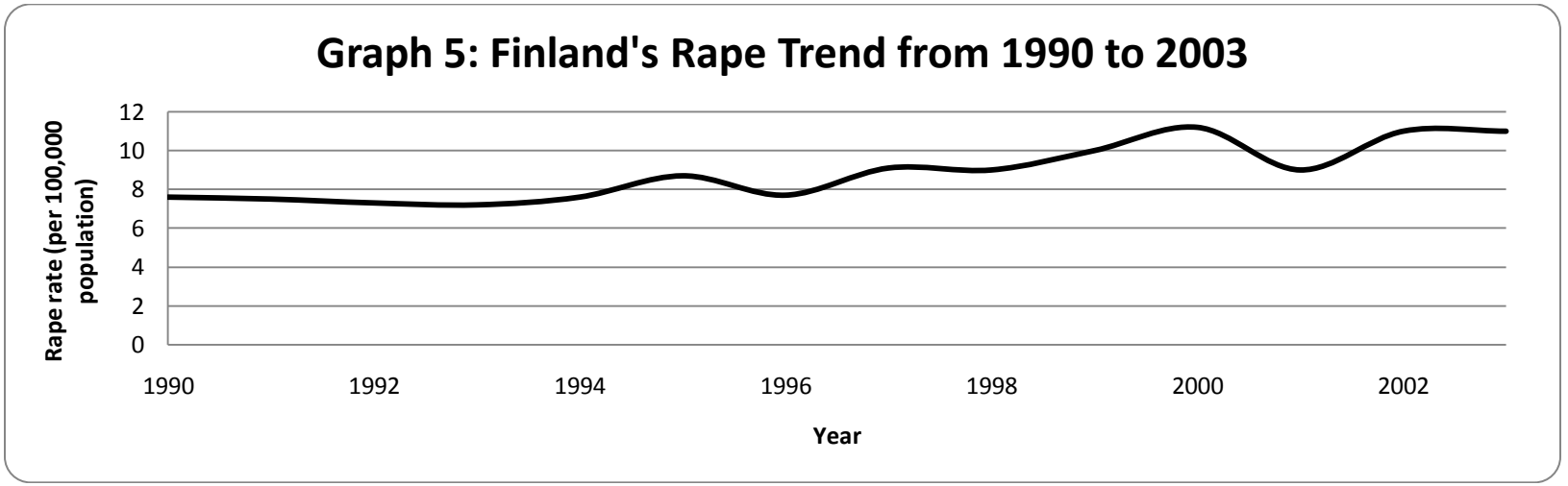
Appendix A

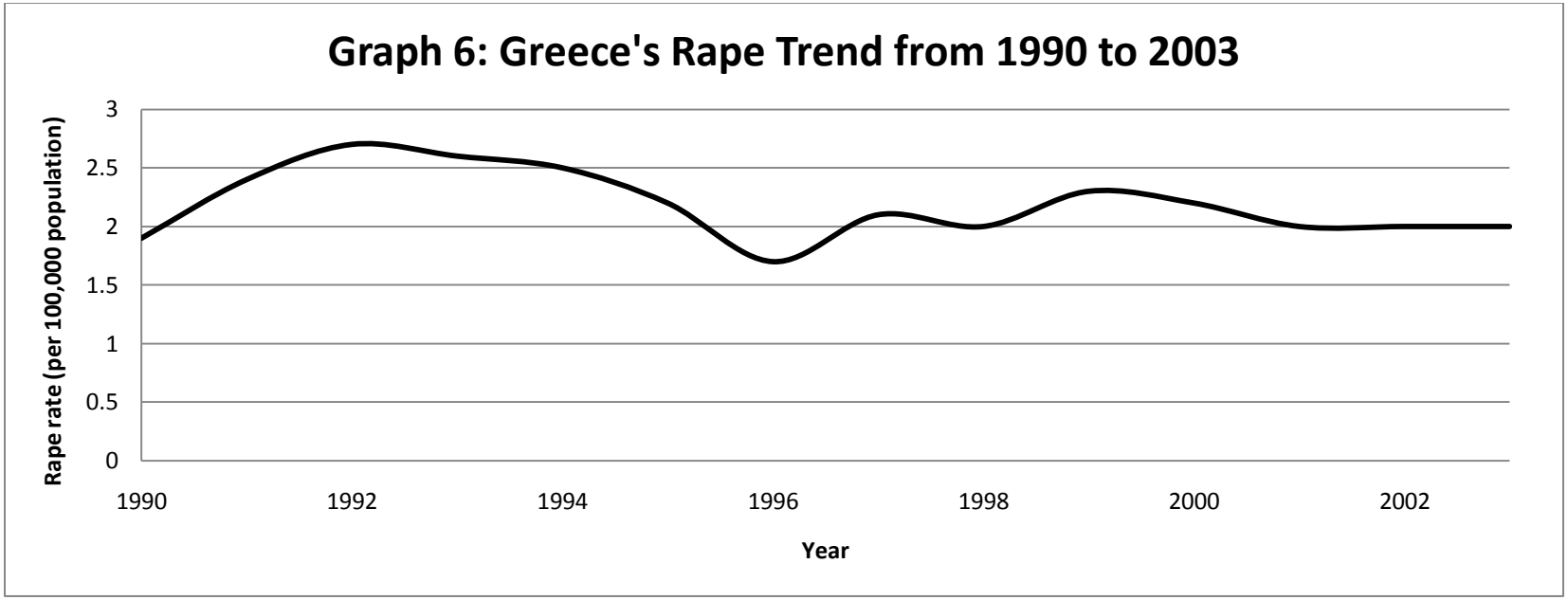

Graph1 : United States Rape Trend from 1990 to 2003
Rape rate (per 100,000 population)
45
40
35
30
25
20
15
10
5
0
1990
1992
1994
1996
1998
2000
2002
Year

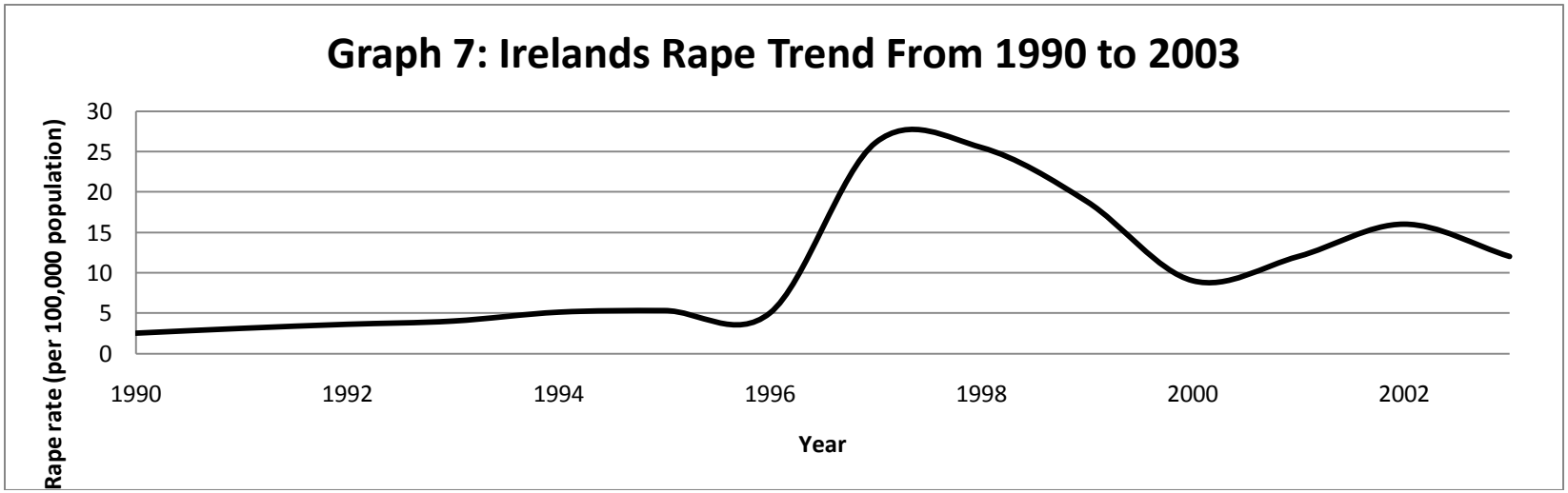

Graph 2: Austria 's Rape Trend from 1990 to 2003
Rate of rape (per 100,000 population)
16
14
12
10
8
6
4
2
0
1990
1992
1994
1996
1998
2000
2002
Year

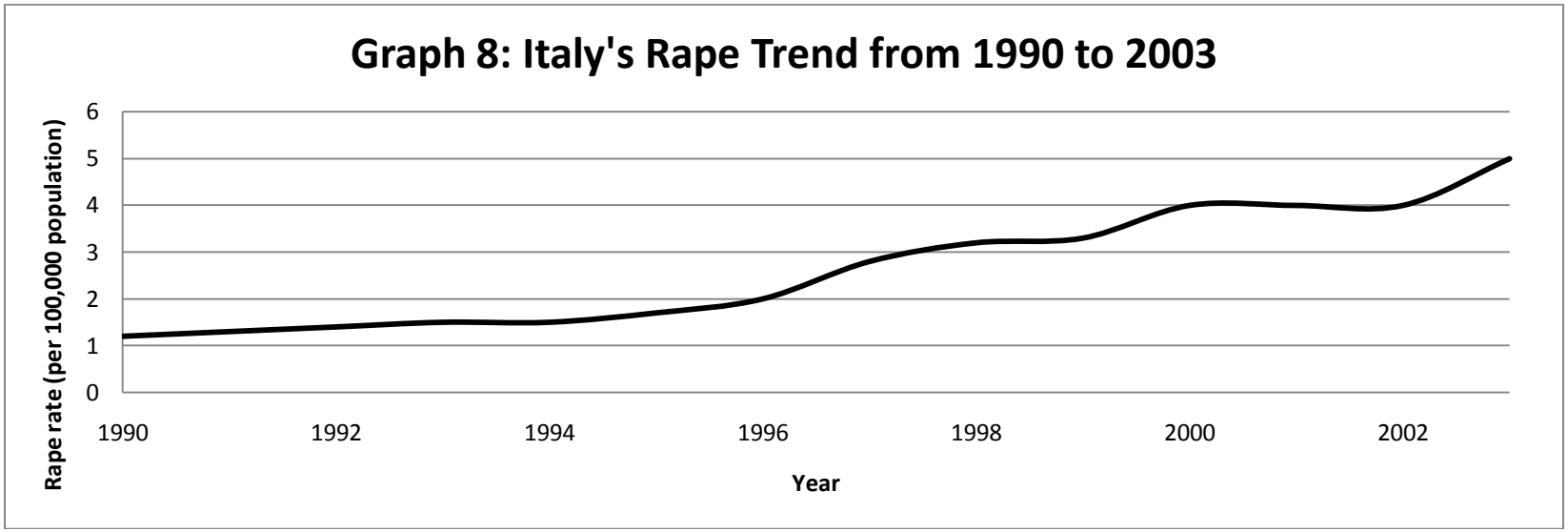

Graph 3: Denmark's Rape Trend from 1990 to 2003
Rape rate (per 100,000 population)
12
10
8
6
4
2
0
1990
1992
1994
1996
1998
2000
2002
Year

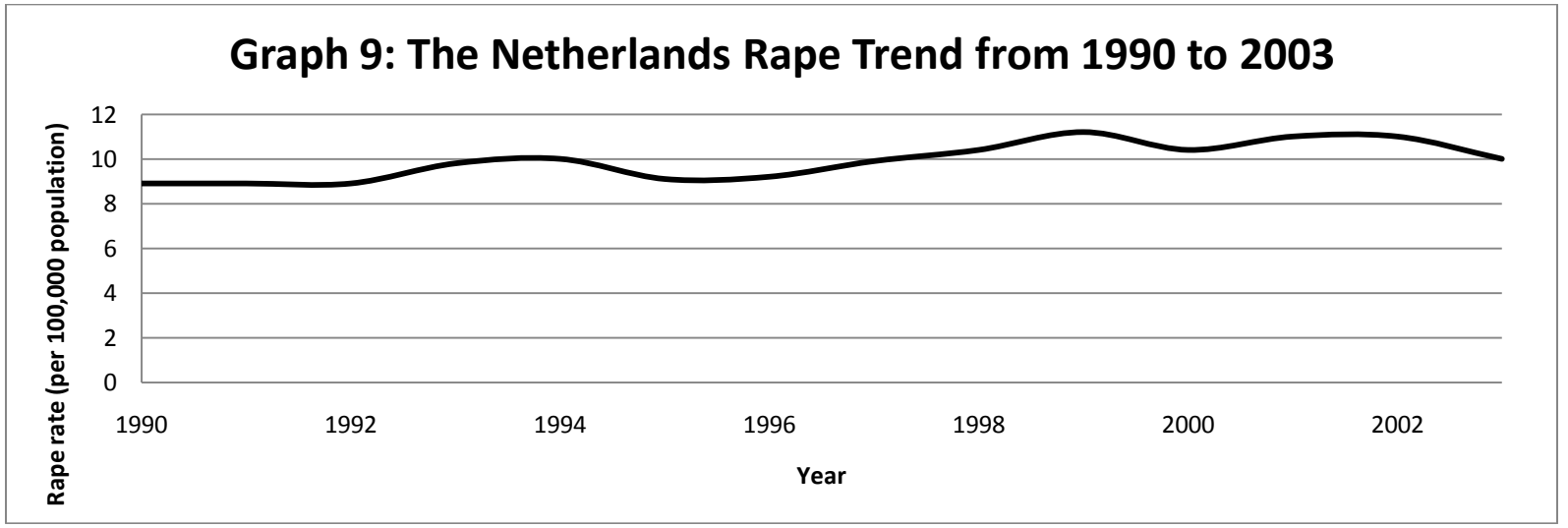

Graph 4: Germany's Rape Trend from 1990 to 2003
Rape rate (per 100,000 population)
12
10
8
6
4
2
0
1990
1992
1994
1996
1998
2000
2002
Year

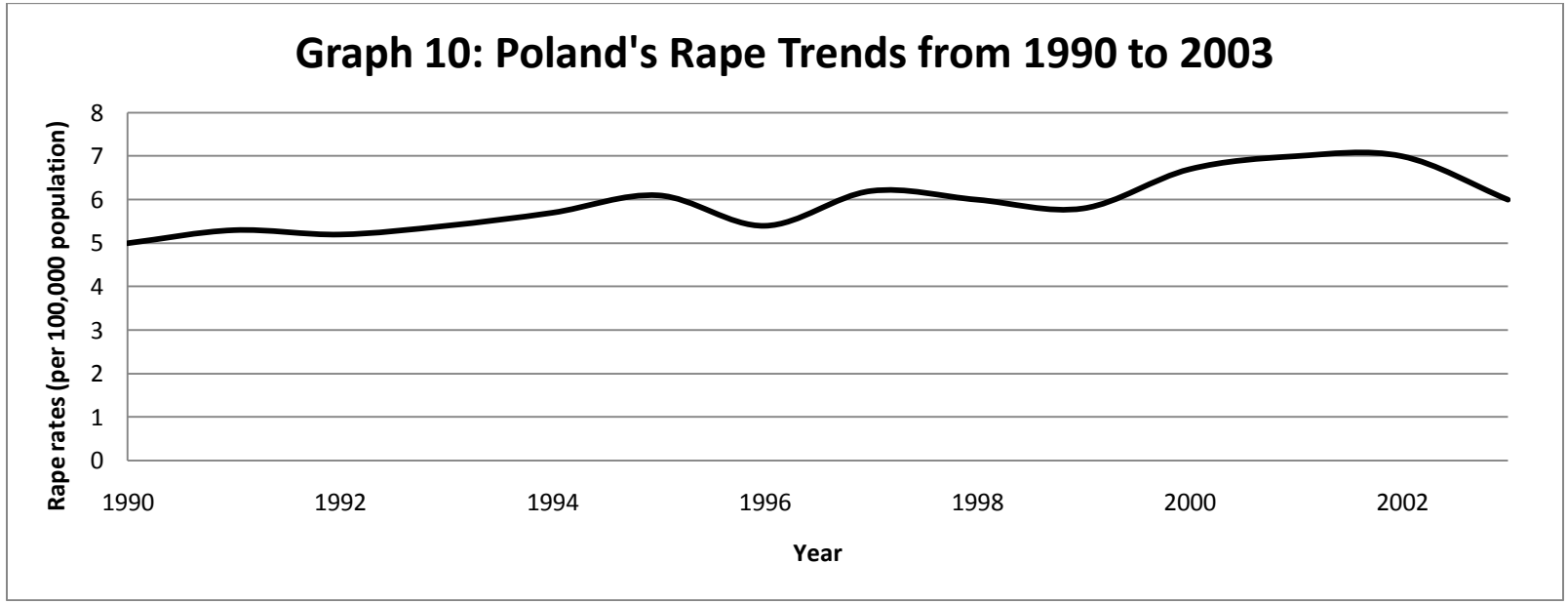

Graph 5: Finland's Rape Trend from 1990 to 2003
Rape rate (per 100,000 population)
12
10
8
6
4
2
0
1990
1992
1994
1996
1998
2000
2002
Year

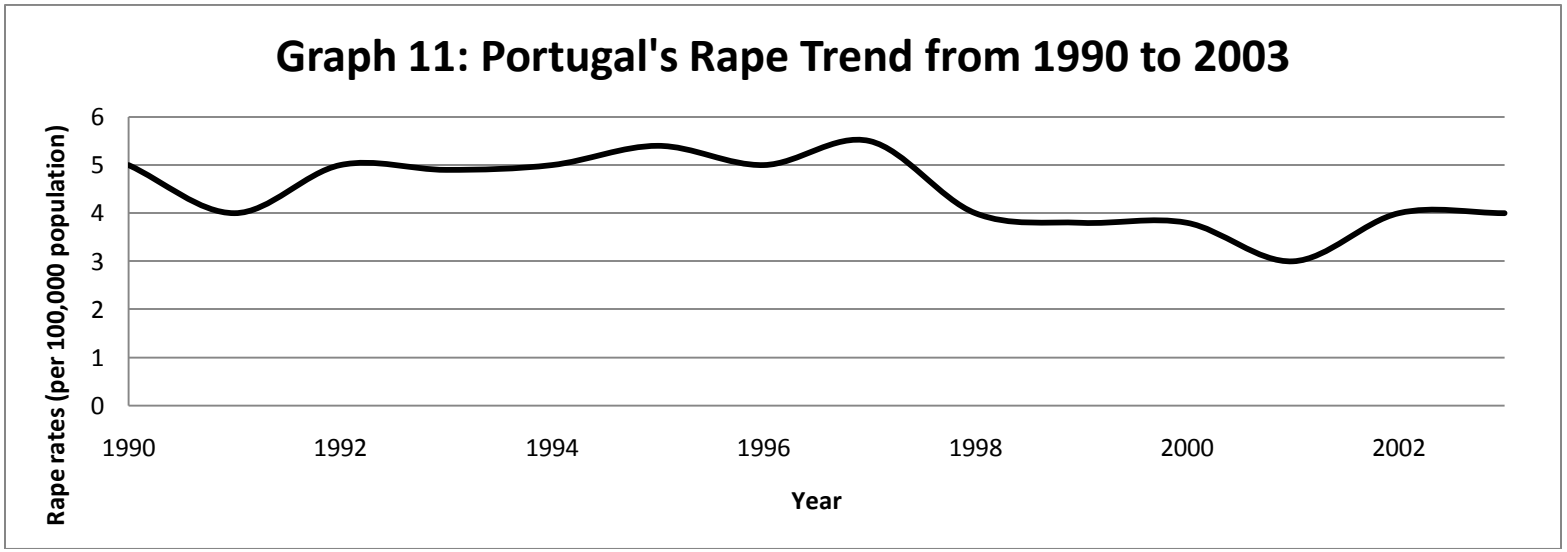

Graph 6: Greece's Rape Trend from 1990 to 2003
Rape rate (per 100,000 population)
3
2.5
2
1.5
1
0.5
0
1990
1992
1994
1996
1998
2000
2002
Year

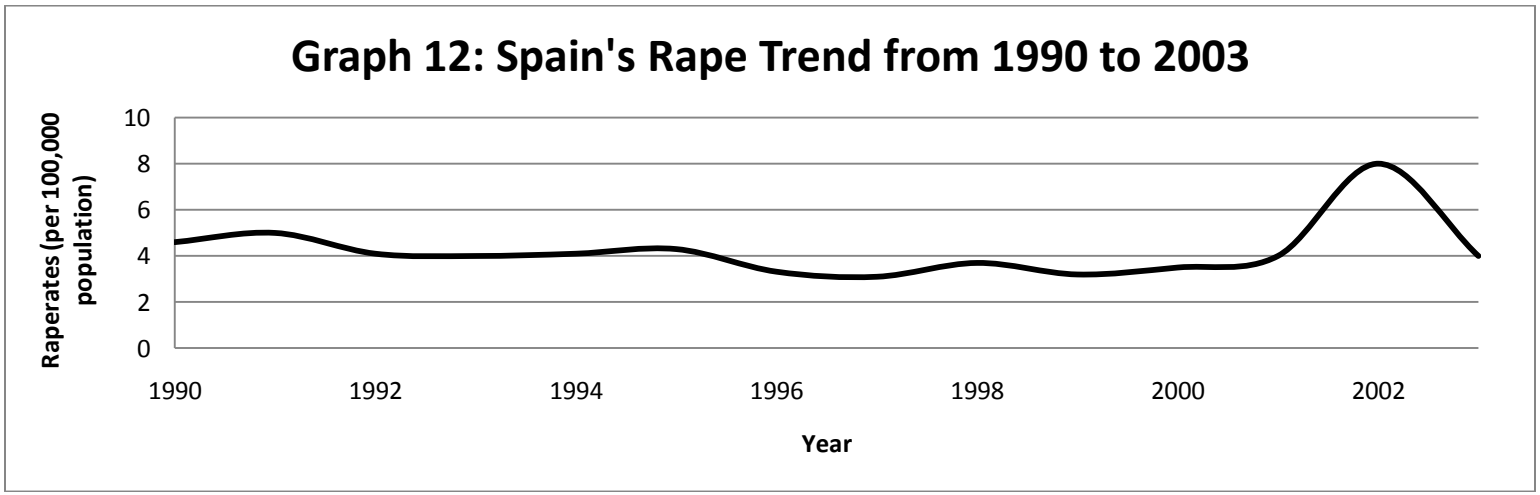

Graph 7: Irelands Rape Trend From 1990 to 2003
Rape rate (per 100,000 population)
30
25
20
15
10
5
0
1990
1992
1994
1996
1998
2000
2002
Year

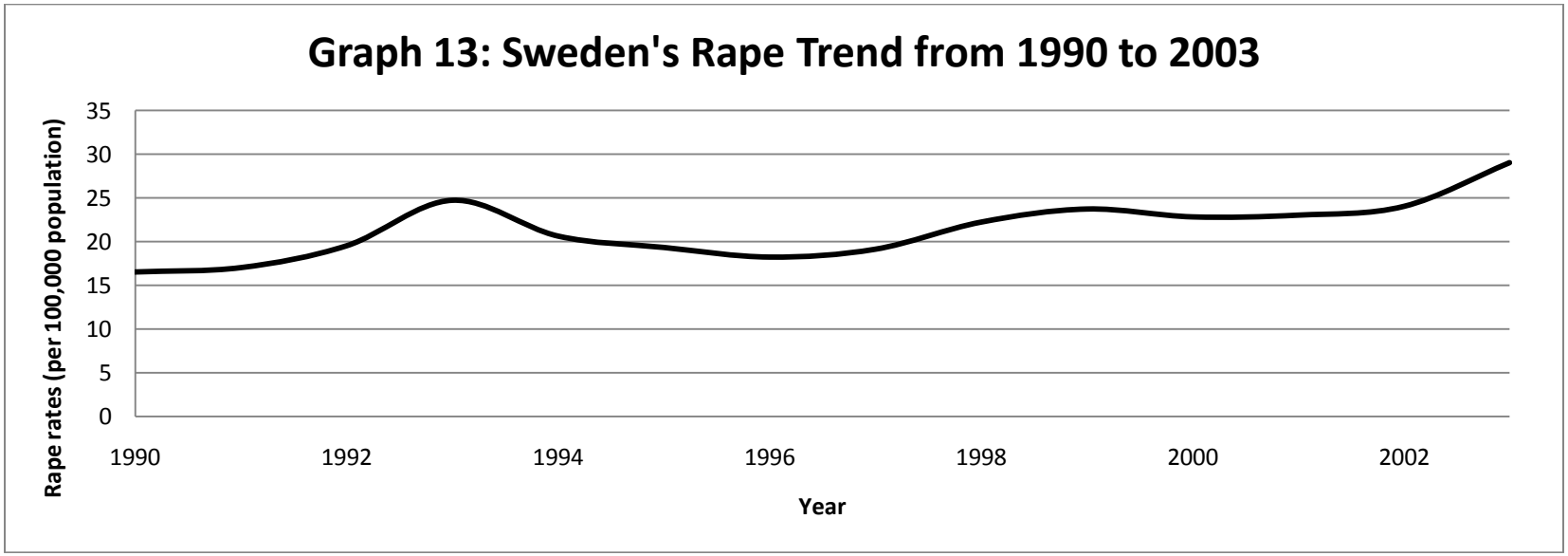

Graph 8: Italy's Rape Trend from 1990 to 2003
Rape rate (per 100,000 population)
6
5
4
3
2
1
0
1990
1992
1994
1996
1998
2000
2002
Year

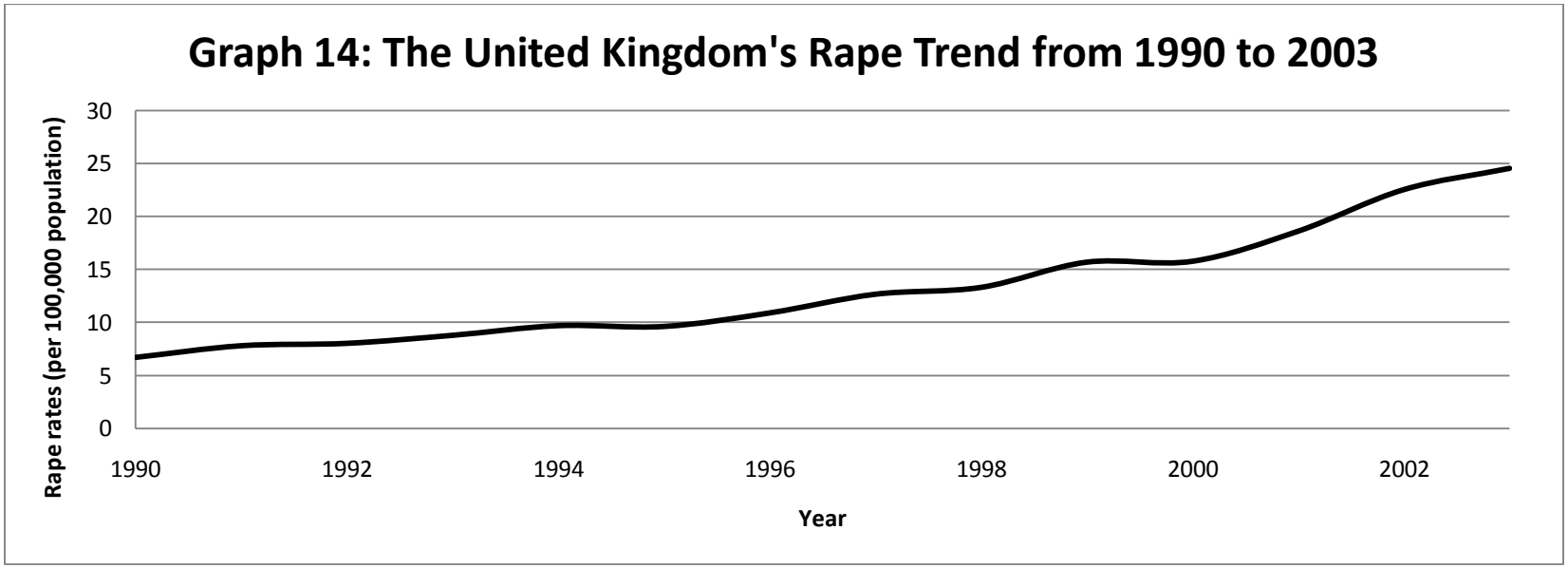

Graph 9: The Netherlands Rape Trend from 1990 to 2003
Rape rate (per 100,000 population)
12
10
8
6
4
2
0
1990
1992
1994
1996
1998
2000
2002
Year


Graph 10: Poland's Rape Trends from 1990 to 2003
Rape rates (per 100,000 population)
8
7
6
5
4
3
2
1
0
1990
1992
1994
1996
1998
2000
2002
Year


Graph 11: Portugal's Rape Trend from 1990 to 2003
Rape rates (per 100,000 population)
0
1
2
3
4
5
6
1990
1992
1994
1996
1998
2000
2002
Year


Graph 12: Spain's Rape Trend from 1990 to 2003
Raperates (per 100,000 population)
0
2
4
6
8
10
1990
1992
1994
1996
1998
2000
2002
Year


Graph 13: Sweden's Rape Trend from 1990 to 2003
Rape rates (per 100,000 population)
35
30
25
20
15
10
5
0
1990
1992
1994
1996
1998
2000
2002
Year


Graph 14: The United Kingdom's Rape Trend from 1990 to 2003
Rape rates (per 100,000 population)
30
25
20
15
10
5
0
1990
1992
1994
1996
1998
2000
2002
Year

Appendix B

Table 9: United States correlation matrix, mean, and standard deviation. (N=13)

	1	2	3	4	5	6	7	8	9	10	11
1. Rape	-										
2. Consumer Confidence	-0.260	-									
3. Unemployment	**0.910**	**-0.734**	-								
4. GDP	**-0.561**	0.359	**-0.742**	-							
5. HDI	0.046	0.066	0.012	-0.257	-						
6. GDI	-0.003	0.054	-0.047	-0.350	**0.763**	-					
7. GEM	-0.194	-0.235	-0.220	0.464	-0.542	-0.524	-				
8. Sex Ratio	0.175	-0.115	-0.020	0.296	0.234	-0.152	-0.073	-			
9. Percent 15 to 24	-0.140	-0.070	-0.076	0.447	-0.120	-0.405	0.068	0.442	-		
10. Percent 50+	0.022	-0.058	0.089	0.106	0.079	-0.144	-0.083	0.171	0.583	-	
11. Crude Divorce	-0.396	0.115	-0.478	0.536	-0.041	-0.018	0.304	0.252	0.263	-0.394	-
Mean	-0.685	0.223	0.019	540.539	0.003	0.004	0.017	0.127	-0.046	0.230	-0.177
SD	1.118	0.831	0.443	446.692	0.016	0.014	0.038	0.123	0.203	0.278	0.242

Note. All variables are first differenced. Bold=$p<0.05$

Table 10: Austria's correlation matrix, mean, and standard deviation. (N=13)

	1	2	3	4	5	6	7	8	9	10	11
1. Rape	-										
2. Consumer Confidence	**-0.5838**	-									
3. Unemployment	-0.3625	0.3974	-								
4. GDP	0.2903	-0.4167	**-0.7662**	-							
5. HDI	0.377	-0.2896	-0.4008	0.2535	-						
6. GDI	-0.2733	0.1778	-0.1413	0.2629	0.1332	-					
7. GEM	-0.2588	-0.0417	0.0954	-0.0667	**-0.7828**	-0.0584	-				
8. Sex Ratio	-0.3046	-0.1995	0.3227	-0.3192	-0.1704	0.2926	0.3681	-			
9. Percent 15 to 24	-0.0183	-0.0729	-0.1499	0.0204	0.2189	-0.2486	-0.1424	-0.3791	-		
10. Percent 50+	0.3279	-0.5149	-0.3603	0.4487	0.1813	-0.0347	0.3086	-0.0851	0.4398	-	
11. Crude Divorce	0.2904	-0.11	0.0062	0.0396	0.2851	0.1499	-0.4377	0.1334	0.0958	-0.1132	-
Mean	0.569	-0.117	0.123	387.546	-0.001	0.005	0.022	0.201	-0.248	0.200	-0.101
SD	1.055	1.408	0.488	306.898	0.017	0.005	0.052	0.128	0.238	0.144	0.226

Note. All variables are first differenced. Bold=$p<0.05$

Table 11: Denmark's correlation matrix, mean, and standard deviation. (N=13)

	1	2	3	4	5	6	7	8	9	10	11
1. Rape	-										
2. Consumer Confidence	-0.1209	-									
3. Unemployment	0.106	**0.6707**	-								
4. GDP	0.1502	-0.5411	**-0.8762**	-							
5. HDI	-0.2903	0.3125	0.0525	-0.1231	-						
6. GDI	0.4688	0.0548	0.4509	-0.22	-0.4005	-					
7. GEM	0.1718	-0.3753	-0.0711	-0.0276	-0.1504	0.2715	-				
8. Sex Ratio	**-0.6222**	0.2991	-0.2297	0.1367	0.2138	**-0.6314**	-0.2627	-			
9. Percent 15 to 24	-0.2063	0.2549	0.0263	-0.2002	0.4705	-0.337	-0.0928	-0.0502	-		
10. Percent 50+	-0.1174	-0.2589	-0.5399	0.3858	0.0661	-0.4476	-0.2114	0.431	-0.257	-	
11. Crude Divorce	-0.0304	-0.3164	-0.4883	**0.6641**	0.0397	-0.0616	-0.0904	0.0717	-0.1059	-0.1335	-
Mean	-0.038	0.246	-0.138	467.500	-0.001	0.005	0.025	0.053	-0.301	0.258	0.028
SD	0.721	1.363	0.885	399.991	0.017	0.008	0.062	0.025	0.103	0.116	0.331

Note. All variables are first differenced. Bold=$p<0.05$

Table 12: Germany's correlation matrix, mean, and standard deviation. (N=13)

	1	2	3	4	5	6	7	8	9	10	11
1. Rape	-										
2. Consumer Confidence	0.0172	-									
3. Unemployment	0.4606	0.5014	-								
4. GDP	-0.3343	-0.7255	**-0.6889**	-							
5. HDI	0.139	-0.5256	0.1588	0.2832	-						
6. GDI	0.193	0.358	0.2816	-0.0186	-0.1848	-					
7. GEM	0.1034	0.1557	-0.0049	-0.0017	-0.1054	0.4711	-				
8. Sex Ratio	-0.3302	0.2275	0.0255	-0.2358	-0.0395	**-0.5625**	0.0159	-			
9. Percent 15 to 24	0.4218	0.085	0.1635	-0.2021	-0.1168	0.5332	0.0272	**-0.76**	-		
10. Percent 50+	-0.0093	-0.6703	-0.4452	0.3024	0.5171	-0.3141	-0.0246	-0.1574	0.164	-	
11. Crude Divorce	0.2321	0.4927	**0.7603**	-0.4152	0.1889	0.4723	-0.1026	-0.3432	0.4234	-0.3614	-
Mean	0.223	-0.149	-0.018	294.516	0.003	0.002	0.016	0.206	-0.196	0.213	-0.143
SD	0.639	1.139	2.126	309.205	0.016	0.007	0.055	0.152	0.304	0.179	0.235

Note. All variables are first differenced. Bold=$p<0.05$

Table 13: Finland's correlation matrix, mean, and standard deviation. (N=13)

	1	2	3	4	5	6	7	8	9	10	11
1. Rape	-										
2. Consumer Confidence	-0.4543	-									
3. Unemployment	-0.2161	0.4942	-								
4. GDP	0.24	-0.5184	**-0.884**	-							
5. HDI	0.3015	0.0504	0.2434	-0.0659	-						
6. GDI	0.4525	-0.1657	0.3009	-0.1159	**0.8079**	-					
7. GEM	0.0421	0.3793	0.0586	0.208	0.6222	0.202	-				
8. Sex Ratio	-0.2397	0.2264	0.7473	-0.7451	0.0666	0.2265	-0.2528	-			
9. Percent 15 to 24	0.1818	-0.2795	-0.7181	**0.7625**	-0.1102	-0.069	0.0497	-0.8849	-		
10. Percent 50+	0.1119	-0.341	-0.7237	0.7272	-0.3124	-0.1363	-0.1831	**-0.6065**	**0.8042**	-	
11. Crude Divorce	0.3896	-0.0296	-0.0255	0.1884	0.1575	-0.1004	0.4852	-0.3351	0.1603	0.0478	-
Mean	0.262	0.240	0.454	361.992	0.003	0.005	0.014	0.110	-0.051	0.486	-0.005
SD	1.110	1.080	2.325	743.732	0.016	0.018	0.061	0.022	0.125	0.294	0.233

Note. All variables are first differenced. Bold=$p<0.05$

Table 14: Greece's correlation matrix, mean, and standard deviation. (N=13)

	1	2	3	4	5	6	7	8	9	10	11
1. Rape	-										
2. Consumer Confidence	0.1529	-									
3. Unemployment	0.324	**0.7782**	-								
4. GDP	0.007	-0.4702	**-0.7504**	-							
5. HDI	-0.1815	0.0811	0.0719	-0.013	-						
6. GDI	0.1795	-0.3057	-0.3635	0.4734	0.4163	-					
7. GEM	-0.3252	0.1377	-0.0299	0.3113	**0.73**	0.4195	-				
8. Sex Ratio	-0.0441	0.2968	**0.5532**	**-0.8754**	-0.0697	-0.2382	-0.2971	-			
9. Percent 15 to 24	0.0832	0.2559	**0.6029**	**-0.6669**	-0.0005	-0.3073	-0.1059	0.4468	-		
10. Percent 50+	0.291	-0.2483	-0.4432	**0.6189**	0.3502	0.3773	0.2635	**-0.6266**	**-0.6715**	-	
11. Crude Divorce	0.3124	0.0836	0.015	0.0377	-0.3182	-0.176	-0.4733	-0.2212	-0.1045	0.2346	-
Mean	0.008	0.039	0.175	245.054	0.003	0.004	0.015	0.084	-0.141	0.182	-0.021
SD	0.290	0.861	0.674	227.482	0.021	0.009	0.058	0.135	0.180	0.141	1.040

Note. All variables are first differenced. Bold=$p<0.05$

Table 15: Ireland's correlation matrix, mean, and standard deviation. (N=13)

	1	2	3	4	5	6	7	8	9	10	11
1. Rape	-										
2. Consumer Confidence	0.1231	-									
3. Unemployment	-0.0472	-0.5223	-								
4. GDP	0.0605	0.307	**-0.7668**	-							
5. HDI	-0.2727	-0.1991	-0.1387	0.1167	-						
6. GDI	0.07	0.482	-0.1997	0.3154	-0.5499	-					
7. GEM	**-0.5442**	0.1821	-0.0202	0.0304	-0.5244	0.577	-				
8. Sex Ratio	0.066	-0.1521	**0.5901**	**-0.7508**	-0.2845	-0.464	-0.1457	-			
9. Percent 15 to 24	0.3137	0.4257	0.0415	-0.4246	-0.4848	-0.046	-0.0448	**0.6324**	-		
10. Percent 50+	0.0062	0.2232	-0.8049	**0.7963**	0.2441	0.0557	-0.0586	**-0.7115**	-0.2988	-	
11. Crude Divorce	-0.3758	-0.0302	-0.2458	0.4619	0.2646	-0.1398	0.2329	-0.3055	-0.4582	0.4484	-
Mean	0.731	-0.079	-0.662	1118.462	0.001	0.006	0.018	0.206	-0.058	0.196	0.000
SD	7.203	0.873	1.204	593.889	0.014	0.023	0.063	0.152	0.156	0.086	0.221

Note. All variables are first differenced. Bold=$p<0.05$

Table 16: Italy's correlation matrix, mean, and standard deviation. (N=13)

	1	2	3	4	5	6	7	8	9	10	11
1. Rape	-										
2. Consumer Confidence	0.1301	-									
3. Unemployment	-0.1505	0.1861	-								
4. GDP	0.0132	0.5189	-0.2791	-							
5. HDI	-0.1523	-0.0883	-0.3064	0.0298	-						
6. GDI	0.1497	0.0002	-0.2915	0.1085	0.4634	-					
7. GEM	-0.2616	-0.5237	0.069	-0.3232	0.2874	0.3476	-				
8. Sex Ratio	0.5154	-0.083	-0.1001	-0.5431	0.3037	0.2187	0.0203	-			
9. Percent 15 to 24	-0.2952	-0.3178	0.0245	-0.4379	0.4837	-0.1866	-0.0094	0.2905	-		
10. Percent 50+	0.0854	0.0076	-0.3631	0.2544	-0.0774	-0.3857	-0.5675	-0.3186	0.1477	-	
11. Crude Divorce	0.2034	0.201	0.0163	0.1909	0.0239	-0.2109	-0.2303	-0.2868	-0.1251	0.3395	-
Mean	0.292	-0.028	-0.038	226.931	0.002	0.004	0.001	-0.033	-0.391	0.367	-0.089
SD	0.335	1.231	0.601	234.236	0.012	0.011	0.097	0.052	0.089	0.100	0.139

Note. All variables are first differenced. Bold=$p<0.05$

Table 17: The Netherland's correlation matrix, mean, and standard deviation. (N=13)

	1	2	3	4	5	6	7	8	9	10	11
1. Rape	-										
2. Consumer Confidence	-0.0223	-									
3. Unemployment	-0.2813	-0.1876	-								
4. GDP	0.2213	0.4968	**-0.7729**	-							
5. HDI	0.2831	0.1303	0.2833	-0.1437	-						
6. GDI	0.017	-0.1624	-0.0378	0.2369	-0.4626	-					
7. GEM	0.3061	-0.2132	0.3995	-0.1868	0.4385	0.3763	-				
8. Sex Ratio	-0.1849	-0.5391	0.1935	-0.5124	-0.1776	0.1858	-0.0521	-			
9. Percent 15 to 24	-0.1733	-0.3436	0.1769	-0.3075	0.1357	-0.3375	-0.2359	0.3176	-		
10. Percent 50+	0.1441	0.3084	**-0.5538**	0.5492	0.173	-0.3983	-0.3036	-0.5177	0.3488	-	
11. Crude Divorce	0.027	0.1397	-0.3882	0.3279	-0.3734	0.4364	-0.1987	0.0191	-0.0526	0.2985	-
Mean	0.085	-0.146	-0.162	417.885	0.001	0.005	0.026	0.027	-0.307	0.340	-0.118
SD	0.643	0.934	0.697	328.025	0.014	0.003	0.046	0.036	0.223	0.178	0.247

Note. All variables are first differenced. Bold=$p<0.05$

Table 18: Poland's correlation matrix, mean, and standard deviation. (N=13)

	1	2	3	4	5	6	7	8	9	10	11
1. Rape	-										
2. Consumer Confidence	0.0294	-									
3. Unemployment	0.5019	-0.2062	-								
4. GDP	-0.37	0.4811	**-0.856**	-							
5. HDI	-0.5184	-0.1409	0.139	-0.0603	-						
6. GDI	-0.0112	0.1323	-0.0069	0.082	0.5221	-					
7. GEM	-0.178	-0.1223	0.3692	-0.399	0.2132	-0.1091	-				
8. Sex Ratio	0.0056	-0.1627	0.0574	-0.0538	0.3359	0.3183	-0.2193	-			
9. Percent 15 to 24	-0.0179	0.0997	-0.0615	0.0635	-0.3487	-0.3735	-0.0549	-0.9303	-		
10. Percent 50+	**-0.6511**	-0.1358	-0.4254	0.4833	0.517	0.0225	-0.325	0.2408	-0.0952	-	
11. Crude Divorce	-0.0405	0.2798	-0.3799	0.4026	-0.4439	-0.4126	-0.089	-0.3499	0.359	-0.0229	-
Mean	0.077	-0.103	1.038	129.990	0.003	0.002	0.022	-0.093	0.231	0.312	-0.122
SD	0.534	0.850	2.257	123.545	0.034	0.017	0.034	0.127	0.156	0.354	0.246

Note. All variables are first differenced. Bold=$p<0.05$

Table 19: Portugal's correlation matrix, mean, and standard deviation. (N=13)

	1	2	3	4	5	6	7	8	9	10	11
1. Rape	-										
2. Consumer Confidence	0.0294	-									
3. Unemployment	0.5019	-0.2062	-								
4. GDP	-0.37	0.4811	**-0.856**	-							
5. HDI	-0.5184	-0.1409	0.139	-0.0603	-						
6. GDI	-0.0112	0.1323	-0.0069	0.082	0.5221	-					
7. GEM	-0.178	-0.1223	0.3692	-0.399	0.2132	-0.1091	-				
8. Sex Ratio	0.0056	-0.1627	0.0574	-0.0538	0.3359	0.3183	-0.2193	-			
9. Percent 15 to 24	-0.0179	0.0997	-0.0615	0.0635	-0.3487	-0.3735	-0.0549	**-0.9303**	-		
10. Percent 50+	**-0.6511**	-0.1358	-0.4254	0.4833	0.517	0.0225	-0.325	0.2408	-0.0952	-	
11. Crude Divorce	-0.0405	0.2798	-0.3799	0.4026	-0.4439	-0.4126	-0.089	-0.3499	0.359	-0.0229	-
Mean	-0.077	-0.159	0.123	187.475	0.000	0.003	0.015	0.035	-0.218	0.309	-0.156
SD	0.733	1.088	0.928	213.977	0.014	0.012	0.042	0.057	0.193	0.076	0.233

Note. All variables are first differenced. Bold=$p<0.05$

Table 20: Spain's correlation matrix, mean, and standard deviation. (N=13)

	1	2	3	4	5	6	7	8	9	10	11
1. Rape	-										
2. Consumer Confidence	-0.0638	-									
3. Unemployment	0.0397	-0.2183	-								
4. GDP	0.0561	0.3534	**-0.9436**	-							
5. HDI	0.0834	-0.1409	0.3236	-0.2526	-						
6. GDI	0.0552	0.3795	0.0885	0.031	0.3919	-					
7. GEM	0.0245	0.4686	-0.0678	0.1563	0.4959	0.7677	-				
8. Sex Ratio	-0.2614	-0.1064	0.0969	-0.1715	0.268	0.1061	0.0966	-			
9. Percent 15 to 24	-0.0946	0.005	0.5084	-0.5216	-0.1958	-0.1986	-0.1568	-0.641	-		
10. Percent 50+	0.1563	0.301	-0.3862	0.433	-0.252	0.1207	0.1152	**-0.7574**	0.2426	-	
11. Crude Divorce	0.1561	0.4021	**-0.6328**	**0.7189**	-0.2649	-0.066	0.266	-0.1943	-0.2952	0.2979	-
Mean	-0.046	0.039	-0.146	294.254	0.000	0.004	0.020	0.025	-0.279	0.245	-0.048
SD	1.707	0.853	1.650	205.650	0.013	0.016	0.060	0.088	0.198	0.108	0.175

Note. All variables are first differenced. Bold=$p<0.05$

Table 21: Sweden's correlation matrix, mean, and standard deviation. (N=13)

	1	2	3	4	5	6	7	8	9	10	11
1. Rape	-										
2. Consumer Confidence	0.0391	-									
3. Unemployment	0.3541	0.0237	-								
4. GDP	-0.3783	0.2085	**-0.9359**	-							
5. HDI	-0.0273	-0.0834	-0.0902	0.1868	-						
6. GDI	0.0095	-0.0979	-0.0206	-0.1193	0.1149	-					
7. GEM	0.2996	0.5237	0.1145	-0.0039	-0.3025	-0.4897	-				
8. Sex Ratio	0.3571	-0.1138	-0.096	0.0906	0.0059	0.1109	0.081	-			
9. Percent 15 to 24	0.0901	-0.3127	-0.3708	0.3924	0.1757	-0.0998	-0.1995	**0.8245**	-		
10. Percent 50+	0.0846	0.2364	0.3143	-0.1872	0.2889	-0.5695	0.4869	-0.0012	-0.0616	-	
11. Crude Divorce	-0.1238	0.3598	-0.5343	0.6978	0.4505	0.0735	0.101	0.1144	0.2779	0.0014	-
Mean	0.962	0.024	0.392	415.854	0.000	0.003	0.013	0.036	-0.161	-0.306	-0.028
SD	2.594	1.131	1.489	576.285	0.015	0.007	0.091	0.048	0.144	3.716	0.305

Note. All variables are first differenced. Bold=$p<0.05$

Table 22: United Kingdom's correlation matrix, mean, and standard deviation. (N=13)

	1	2	3	4	5	6	7	8	9	10	11
1. Rape	-										
2. Consumer Confidence	-0.1839	-									
3. Unemployment	-0.0284	-0.1618	-								
4. GDP	0.0291	0.2367	**-0.9152**	-							
5. HDI	-0.1195	0.1291	0.0785	0.0426	-						
6. GDI	-0.1145	-0.1437	0.1395	-0.2325	0.1474	-					
7. GEM	-0.0564	-0.3585	-0.4652	0.4119	0.5019	0.3982	-				
8. Sex Ratio	0.7112	-0.3583	-0.3162	0.3507	-0.016	-0.0442	0.3323	-			
9. Percent 15 to 24	0.6485	-0.3452	-0.369	0.4692	0.056	-0.0135	0.3705	**0.9582**	-		
10. Percent 50+	0.2416	-0.135	**-0.771**	**0.7705**	-0.1633	-0.153	0.4135	0.4771	**0.5511**	-	
11. Crude Divorce	0.1126	0.2266	-0.1697	0.353	0.398	0.2225	0.3916	0.4245	0.4875	0.2588	-
Mean	1.369	0.031	-0.146	478.569	0.001	0.004	0.008	0.076	-0.180	0.164	-0.109
SD	1.170	0.877	0.826	321.887	0.023	0.014	0.030	0.075	0.254	0.148	0.191

Note. All variables are first differenced. Bold=$p<0.05$

Appendix C

Table 23: Individual European nations definitions of rape

Nation	Definition of Rape
Austria	sexual intercourse with a person against her/his will (per vagina or other), including other then vaginal penetration, violent intra-marital intercourse, sexual intercourse without force with a helpless person, sexual intercourse with or without force with a minor, and incestual sexual intercourse with force with a minor
Denmark	sexual intercourse with a person against her/his will (per vagina or other), including other then vaginal penetration, violent intra-marital intercourse, sexual intercourse without force with a helpless person, sexual intercourse with or without force with a minor, and incestual sexual intercourse with force with a minor
Finland	sexual intercourse with a person against her/his will (per vagina or other), including other then vaginal penetration, violent intra-marital intercourse, sexual intercourse without force with a helpless person, and sexual intercourse with or without force with a minor
Germany	sexual intercourse with a person against her/his will (per vagina or other), including other then vaginal penetration, violent intra-marital intercourse, sexual intercourse without force with a helpless person, sexual intercourse with or without force with a minor, and incestual sexual intercourse with force with a minor
Greece	sexual intercourse with a person against her/his will (per vagina or other), including other then vaginal penetration, violent intra-marital intercourse with force, sexual intercourse without force with a helpless person, sexual intercourse with force with a minor, and incestual sexual intercourse with force or without force with a minor
Hungary	sexual intercourse with a person against her/his will (per vagina or other), including other then vaginal penetration, violent intra-marital intercourse, sexual intercourse without force with a helpless person, sexual intercourse with or without force with a minor, and incestual sexual intercourse with force with a minor
Ireland	sexual intercourse with a person against her/his will (per vagina or other), including other then vaginal penetration, violent intra-marital intercourse, sexual intercourse without force with a helpless person, sexual intercourse with or without force with a minor, and incestual sexual intercourse with force with a minor
Italy	sexual intercourse with a person against her/his will (per vagina or other), including other then vaginal penetration, violent intra-marital intercourse, sexual intercourse without force with a helpless person, sexual intercourse with or without force with a minor, and incestual sexual intercourse with force with a minor
Netherlands	sexual intercourse with a person against her/his will (per vagina or other), including other then vaginal penetration, violent intra-marital intercourse, sexual intercourse without force with a helpless person, and sexual intercourse with or without force with a minor

Table 24: Individual European nations definitions of rape continued

Poland	sexual intercourse with a person against her/his will (per vagina or other), including other then vaginal penetration, violent intra-marital intercourse, sexual intercourse without force with a helpless person, sexual intercourse with or without force with a minor, and incestual sexual intercourse with force with a minor
Portugal	sexual intercourse with a person against her/his will (per vagina or other), including other then vaginal penetration, violent intra-marital intercourse, sexual intercourse without force with a helpless person, sexual intercourse with or without force with a minor, and incestual sexual intercourse with force with a minor
Spain	sexual intercourse with a person against her/his will (per vagina or other), including other then vaginal penetration, violent intra-marital intercourse, sexual intercourse without force with a helpless person, sexual intercourse with or without force with a minor, and incestual sexual intercourse with force with a minor
Sweden	sexual intercourse with a person against her/his will (per vagina or other), including other then vaginal penetration, violent intra-marital intercourse, sexual intercourse without force with a helpless person, sexual intercourse with or without force with a minor, and incestual sexual intercourse with force with a minor
UK: England and Wales	sexual intercourse with a person against her/his will (per vagina or other), including other then vaginal penetration, violent intra-marital intercourse, sexual intercourse without force with a helpless person, sexual intercourse with or without force with a minor, and incestual sexual intercourse with force with a minor
UK: Northern Ireland	sexual intercourse with a person against her/his will (per vagina or other), including sexual intercourse without force with a helpless person, sexual intercourse with or without force with a minor, and incestual sexual intercourse with force with a minor
UK: Scotland	sexual intercourse with a person against her/his will (per vagina or other), including violent intra-marital intercourse, sexual intercourse with force with a minor, and incestual sexual intercourse with force with a minor

Appendix D

Table 25: Descriptive statistics before regression based imputation.

	N	Mean	SD	Min	Max
Rape	192	10.74	9.25	1.20	42.80
Consumer Confidence	193	98.97	9.41	76.81	121.88
Unemployment	195	8.58	3.99	1.70	20.00
GDP	196	19152.95	7549.17	2871.37	25289.00
HDI	140	0.91	0.03	0.80	0.95
GDI	140	0.90	0.03	0.80	0.95
GEM	140	0.67	0.11	0.37	0.86
Sex Ratio	196	95.48	1.68	91.60	98.15
Percent 15 to 24	196	13.92	1.81	10.79	17.48
Percent 50 plus	196	31.46	3.96	23.64	42.72
Crude Marriage	196	5.58	1.15	3.57	9.80

Table 26: Descriptive statistics after regression based imputation

	N	Mean	SD	Min	Max
Rape	196	10.60	9.20	1.20	42.80
Consumer Confidence	196	99.06	9.38	76.81	121.88
Unemployment	196	8.60	3.98	1.70	20.00
GDP	196	19152.95	7549.17	2871.37	25289.00
HDI	196	0.92	0.03	0.80	0.96
GDI	196	0.89	0.03	0.80	0.95
GEM	196	0.64	0.12	0.32	0.86
Sex Ratio	196	95.48	1.68	91.60	98.15
Percent 15 to 24	196	13.92	1.81	10.79	17.48
Percent 50 plus	196	31.46	3.96	23.64	42.72
Crude Marriage	196	5.58	1.15	3.57	9.80

Table 27: Results for Dickey-Fuller stationary test, before and after first differencing.

	Z(t) p= Before First Difference	Z(t) p= After First Difference
United States	**0.881**	**0.102**
Austria	**0.926**	0.000
Denmark	**0.558**	0.017
Germany	**0.972**	0.001
Finland	**0.716**	0.000
Greece	**0.273**	0.007
Ireland	**0.398**	**0.398**
Italy	**0.994**	0.052
Netherlands	**0.426**	0.021
Poland	**0.322**	0.004
Portugal	0.026	0.000
Spain	0.029	0.000
Sweden	**0.792**	**0.074**
United Kingdom	**0.999**	**0.105**

Note. Bold equals nonstationary

Appendix E

Consumer Confidence Measures

Index of Consumer Sentiment Questions[21]

Question 1: "We are interested in how people are getting along financially these days. Would you say that you (and your family living there) are better off or worse off financially than you were a year ago?"

Question 2: "Now looking ahead—do you think that a year from now you (and your family living there) will be better off financially, or worse off, or just about the same as now?"

Question 3: "Now turning to business conditions in the country as a whole—do you think that during the next 12 months we'll have good times financially, or bad times, or what?"

Question 4: "Looking ahead, which would you say is more likely—that in the country as a whole we'll have continuous good times during the next 5 years or so, or that we will have periods of widespread unemployment or depression, or what?"

Question 5: "About the big things people buy for their homes—such as furniture, a refrigerator, stove, television, and things like that. Generally speaking, do you think now is a good or bad time for people to buy major household items?"

European Economic Sentiment Indicator [22]

> The Economic Sentiment Indicator (ESI) is a composite indicator made up of five sectoral confidence indicators with different weights: Industrial confidence indicator, Services confidence indicator, Consumer confidence indicator, Construction confidence indicator Retail trade confidence indicator. Confidence indicators are arithmetic means of seasonally adjusted balances of answers to a selection of questions closely related to the reference variable they are supposed to track (e.g. industrial production for the industrial confidence indicator). Surveys are defined within the Joint Harmonised EU Programme of Business and Consumer Surveys. The economic sentiment indicator (ESI) is calculated as an index with mean value of 100 and standard deviation of 10 over a fixed standardised sample period. (Economic Sentiment Indicator)

[21] University of Michigan, 2009. www.sca.isr.umich.edu

[22] Source Eurostat, http://epp.eurostat.ec.europa.eu/tgm/web/table/description.jsp

Appendix F

Calculating the Human Development Index (HDI)

Step 1: Calculating the life expectancy index

Life expectancy dimension Index= life expectancy actual value – life expectancy minimum value / life expectancy maximum value – life expectancy minimum value

Step 2: Calculating the education index

Adult literacy dimension Index= Adult literacy actual value – Adult literacy minimum value / Adult literacy maximum value – Adult literacy minimum value

Enrollment dimension Index= enrollment actual value – enrollment minimum value / enrollment maximum value – enrollment minimum value

Education index = 2/3(adult literacy index) + 1/3 (gross enrolment index)

Step 3: Calculating the GDP index

GDP = log(GDP actual value) – log(GDP minimum value) / log(GDP maximum value) –log(GDP minimum value)

Step 4: Calculating the HDI

HDI=1/3 (life expectancy index) + 1/3 (education index) +1/3(GDP index)

Goalpost for calculating the HDI

Indicator	Maximum Value	Minimum Value
Life expectancy at birth (years)	85	25
Adult literacy rate (%)	100	0
Combined gross enrolment ration (%)	40,000	100
GDP per capita (PPP US$)	40,000	1000

Calculating the Gender-Related Development Index(GDI) and Goalpost for GDI

Step 1: Calculating the equally distributed life expectancy index

Dimension Index= actual value – minimum value / maximum value –minimum value

Step 2: Calculating the equally distributed education index

Female education index= 2/3 (female adult literacy index) + 1/3 (female gross enrolment index)

Male education index= 2/3 (male adult literacy index) + 1/3 (male gross enrolment index)

Equally distributed education index = [(female population share) (female education index^{-1})] + [(male population share) (male education index^{-1})]

Step 3: Calculating the equally distributed income index

Female Income index = log(female actual value) – log(female minimum value) / log(female maximum value) –log(female minimum value)

Male Income index = log(male actual value) – log(male minimum value) / log(male maximum value) – log(male minimum value)

Equally distributed income index= [(female population share) (female income index^{-1})] + [(male population share) (male income index^{-1})]

Step 4: Calculating the GDI

GDI=1/3 (life expectancy index) + 1/3 (education index) +1/3(income index)

Goalpost for GDI

Indicator	Maximum value	Minimum value
Female Life expectancy at birth (years)	87.5	27.5
Male lie expectancy at birth (years)	82.5	22.5
Adult literacy rate (%)	100	0
Combined gross enrolment ratio (%)	100	0
Estimated earned income (PPP US$)	40,000	100

Calculating the Gender Empowerment Measure (GEM)

Step 1: Calculating the Equally Distributed Equivalent Percentage (EDEP) for parliamentary representation

EDEP for parliamentary representation =[(female population share) (female parliamentary share^{-1})] + [(male population share)(male parliamentary share^{-1}))]$^{-1}$

Indexed EDEP for parliamentary representation= EDEP for parliamentary representation/ideal value (50%)

Step 2: Calculating the EDEP for economic participation

EDEP for position as legislator, senior officials and managers=[(female population share)(female percentage share of position as legislators ect^{-1})] + [(male population share)(male percentage share of position as legislators ect^{-1})] $^{-1}$

Indexed EDEP for positions as legislators ect= EDEP for positions as legislators ect / ideal value (50%)

EDEP for professional and technical positions= [(female population share) (female technical positions share^{-1})] + [(male population share)(male technical positions share^{-1})]^{1}

Indexed EDEP for professional and technical positions = EDEP for technical positions/ideal value (50%)

EDEP for economic participation= indexed EDEP for positions as legislators ect + EDEP for technical positions/2

STEP 3: Calculating the EDEP for Income

Calculating female income index=female estimated Earned income (PPP US$) – Minimum value/ maximum value –minimum value

Calculating male income index=male estimated Earned income (PPP US$) – Minimum value/ maximum value –minimum value

EDEP for income = [(female population share)(female income index^{-1})+(male population share(male population income index^{-1})]$^{-1}$

STEP 4: Calculating the GEM

GEM= Indexed EDEP for parliamentary representation+ EDEP for economic participation + EDEP for Income/3

Goalpost for GEM

Indicator	Maximum value	Minimum value
Estimated earned income (PPP US$)	40,000	100