

SOCIAL IMPACTS OF LEGALIZATION OF DRUGS AND PROSTITUTION

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- (2) No portion of this research project has been submitted in support of any application for any other degree or qualification of this or any other university, or other institutes of learning.
- (3) Equal contribution has been made by each group member in completing the research project.
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TABLE OF CONTENTS

		PAGE
Copyright Page		i
Declaration		ii
Acknowledgement		iii
Table of Content		iv
List of Tables		v
List of Figures.....		vi
List of Abbreviations.....		vii
List of Appendices.....		viii
Abstract.....		ix
Chapter 1	Research Overview	
1.1	Research Background	1
	1.1.1 Does Legalization Bring Impact to the Country?	3
	1.1.2 When Legalization Started?	5
1.2	Problem Statement	6
1.3	Research Objective	11
1.4	Research Question	11
1.5	Hypothesis	12
	1.5.1 Abortion	12
	1.5.2 HIV	12
	1.5.3 Fertility	12

1.6	Significance of Study	13
1.7	Chapter Layout	14
1.8	Conclusion	14
Chapter 2	Literature Review	
2.0	Why and Why Not Legalize Drugs and Prostitution? ...	15
2.1	Decreased in Abortion Rate?	15
2.2	Reduce HIV/AIDS?	16
2.3	Reduce Fertility Rate?	18
2.4	Reduce Crime Rate?	19
2.5	Improve Public Health?	21
2.6	Hypothesis Development	23
Chapter 3	Methodology	
3.0	Introduction	24
3.1	Breaking down the model	
	3.1.1 The Model	24
3.2	How does the model work?	
	3.2.1 Fertility	26
	3.2.2 HIV	28
	3.2.3 Abortion	30
3.3	How do we collect and process data?	
	3.3.1 Data Collection Method	31
	3.3.2 Data Sources	31
	3.3.3 Data Collection Method and Data Processing...	32

3.4	Constructing the Basic Models	
	3.4.1 Pooled OLS	34
	3.4.2 Fixed Effect Model	35
	3.4.3 Random Effect Model	36
3.5	How Preferred Model Is Chosen?	
	3.5.1 Likelihood Ratio Test	37
	3.5.2 Breusch and Pagan Lagrange Multiplier Test	38
	3.5.3 Hausman Test	38
3.6	Conclusion	39
Chapter 4	Data Analysis	
4.0	Unit Root Test	40
4.1	Basic Model	41
4.2	Preferred Model	45
4.3	Does Legalization of Prostitution increase or decrease the Fertility rate and HIV prevalence?	46
4.4	Does Drug legalization Contribute effect to Fertility Rate and HIV prevalence?	49
4.5	Conclusion	51
Chapter 5	Conclusion	
5.0	Introduction	57
5.1	Discussion on Major Findings	57
5.2	Policy Implication	61
5.3	Limitations of the Study	62
	5.3.1 Omitted Variables	63

	5.3.2 Different Proxy for legalization	63
5.4	Recommendations for Future Research	
	5.4.1 Conduct the Determinant Based on Different Perspective	64
	5.4.2 Improve the Sensitivity of Scale	64
5.5	Conclusion	65

List of Table

		Pages
Table 1.1	Legalization status of 37 countries	2
Table 3.1	Summary of variables and data sources	33
Table 4.1	Unit root test	40
Table 4.2	Basic model for abortion	42
Table 4.3	Basic model for fertility	43
Table 4.4	Basic model for HIV	44
Table 4.5	Results for abortion rate after prostitution is legalized through social variable	52
Table 4.6	Test Results for Variable With and Without Interactive Term Regressed Against Fertility	53
Table 4.7	Test Results for Variable With and Without Interactive Term Regressed Against HIV	54
Table 4.8	The Impact on Fertility Rate before and after Legalizing Drug	55
Table 4.9	Test Results for Variable With and Without Interactive Term Regressed Against HIV	56

List of Figure

		Pages
Figure 1.1	Percentage of youth abuse rate on drugs	4
Figure 1.2	Police recorded crime rate in Belgium	5
Figure 1.3	Fertility rate among general population in Portugal and Russia	7
Figure 1.4	Drugs use among general population among generation in Sweden	8
Figure 1.5	The HIV among general population in Bolivia	9
Figure 1.6	Impact of legalization of prostitution	10

LIST OF ABBREVIATIONS

ADF	Augmented Dickey-Fuller Test
CP	Contraceptive Prevalence
DLGDP	Log Real Gross Domestic Product
FAMPLAN	Family Planning
FEM	Fixed Effect Model
FRN	freedom Of Religion
HC	Human Capital
HDI	Human Development Index
LA	Latin America
LEGALDRUG	Legalization of drugs
LEGALPROS	Legalization of Prostitution
LLC	Levin, Lin and Chu test
LM	Lagrange Multiplier
LR	Likelihood Ratio
POLS	Pooled Ordinary Least Square
REM	Random Effect Model

CHAPTER 1: RESEARCH OVERVIEW

1.1 Research Background

Over the years, there are variety of studies have discussed on the issue that whether the government should legalize immoral activities such as drugs and prostitution or not. Based on our research, countries that had legalized drugs and prostitution are mostly western countries. Therefore, many studies investigated this topic focusing on western countries on the social impacts found from legalizing drugs and prostitution. In our research study, we will focus on 37 countries in the region of Latin America and Europe to investigate the social impacts after legalization of drugs and prostitution.

1.1.1 Does legalization bring impact to the country?

According to David & Evans (2013), legalization will not merely bring economic impacts to a country but also social impacts. In our research, we will only discuss on the social impacts after legalization of drugs and prostitution. Some of the journal stated that violent crimes are associated with the illegal market such as drugs (Bowen, 2013). Bowen mentioned that when country legalized drugs, it will reduce the violent crimes through the control of government. However, there are some arguments claiming that legalization of medical drugs will increase the criminal cases. Legalization would not reduce drug related crime such as robbery. For example, drug users will still commit crime in order to pay cost of taking drugs. The table below shows legalization status of 37 countries in the region of Latin America and Europe.

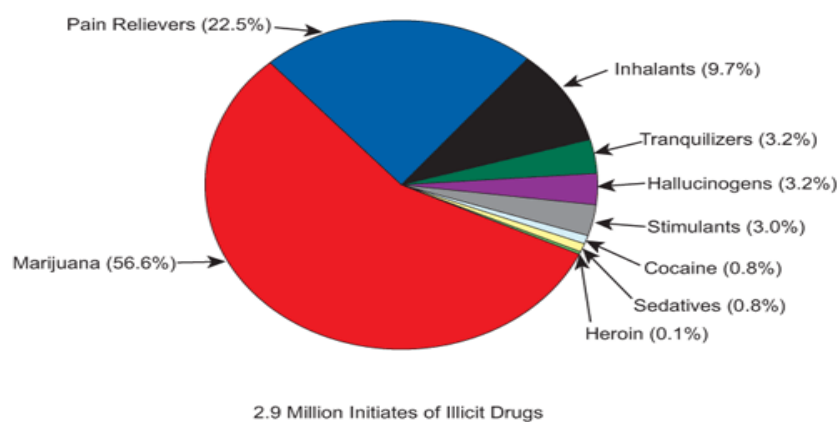
Table 1.1: Legalization status of 37 countries

Country	Prostitution		Drugs	
	Legalize	Not Legalize	Legalize	Not Legalize
Albania		✓		✓
Austria	✓			✓
Belize		✓		✓
Bolivia	✓			✓
Brazil	✓			✓
Bulgaria		✓		✓
Chile	✓			✓
Columbia	✓			✓
Costa Rica	✓			✓
Denmark	✓			✓
Dominican Republic	✓			✓
Ecuador	✓			✓
El Salvador	✓			✓
Finland		✓		✓
Germany	✓			✓
Greece	✓			✓
Guatemala	✓			✓
Honduras	✓		✓	
Ireland	✓			✓
Italy	✓			✓
Jamaica		✓		✓
Mexico	✓			✓
Netherlands	✓			✓
Nicaragua	✓			✓
Norway		✓		✓
Panama	✓			✓
Paraguay	✓			✓
Portugal	✓			✓
Peru	✓			✓
Russia		✓		✓
Spain		✓		✓
Switzerland	✓			✓
Trinidad and Tobago		✓		✓
Turkey	✓			✓
Uruguay	✓		✓	
United Kingdom		✓		✓
Venezuela	✓			✓

Conversely, there is a statement saying that legalization of drugs and prostitution would improve the development in the sex industry. Government in Netherlands supported the associations of sex business and organizations to protect the interests of clients and to educate people about the uses of prostitution services. The examples for these associations are “Association of Operators of Relaxation Business” and “Man/Woman and Prostitution Foundation”. The legalization of prostitution will only increase the demand for female bodies and more exotic women are found to serve in brothel market. A report from Dutch National Rapporteur on trafficking has stated that the amount of prostitution will increase in the future since legalization has transformed prostitution from illegal to legal “sex work”, more and more foreign and local females will serve in this market (Bureau, 2002).

Legalization of drugs will send a wrong message to the public especially to younger generations. They will start to consume drugs due to peer influence or as a sign of growing. A study on the initial level of legalized marijuana shows that there will be negative impacts on youth and an increase the use of marijuana among youth (David & Evans, 2013). Figure 1.1 shows the percentage of drugs abuse rate among youth. Marijuana has the highest percentage of 56.6% among others drug species. We can conclude that most of the teenagers are addicted with the use of marijuana.

Figure 1.1: Percentage of youth abuse rate on drugs

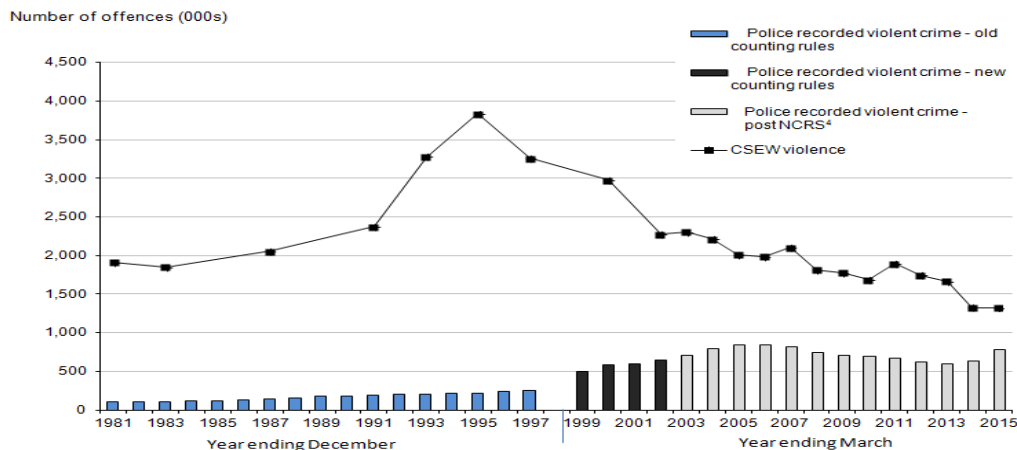


Source: Addiction of Illicit Drugs among teens – Teen substance abuse statistics, charts and graphs.

After drugs and prostitution being legalized, lots of studies shows that it will bring positive impact to the society in terms of abortion, fertility, crime rate, HIV, prevalence of rape and human trafficking issues. According to the research, there are evidences to prove that the legalization of prostitution will protect the sex worker and minimize the number of human trafficking as well as reduce the violent. The legislation will bring a significant positive impact to the society. While there are still some arguments claiming that some people are still holding strong morality thinking where they think that it is immoral as well as more crime will be happened. The people who have strong morality thinking believe that legalized drugs and prostitution will increase the violent crime as people can approach to drugs easily and trigger peoples' violent action, this in turn make sex workers to become the victims.

However, after legalized prostitution, sex workers are said to be protected by the law and human rights. Crime rate can be controlled and reduced. Figure 1.2 shows the Police recorded on crime in Belgium. Belgium has legalized cannabis in years 2003, we can observe that the crime rate does not increase after legalization and the violent crime rate is decrease as shown in Figure 1.2. The Professor of Finance from North-eastern State University stated that the legalized prostitution in United States will decrease the rape rate by 25% where a reduction of 25,000 cases per year (Cundiff, 2004). However, there are some arguments from others researcher stated that rape rate is not able to eliminate because sex work is considered as rape. Therefore, it will bring negative impact to the society in different prospective when the drugs and prostitution are being legalized.

Figure 1.2: Police recorded crime rate in Belgium



Source: Overview of violent crime and sexual offences – Office for National Statistic

1.1.2 When legalization started?

Since the mid-1980s, there are numerous debates on how to address the legislation of drug and prostitution legally. Many European countries have legalized or decriminalized drugs and prostitution in these recent years. According to Global Commission on HIV and the law, there are 13 countries that do not provide information about the sex work, 80 countries that has a lower level of legal protection on the prostitution industry and 116 countries have penal laws against the prostitution (Global Commission 2012). There are increasing numbers of country that legalized drugs and prostitution. For example, California legalized the usage of marijuana and cannabis with the passage of Proposition 64. This increases the usage and productivity of drugs in the countries. Maine's Marijuana was Legalization on 8 November, 2016 and it was approved after the election. The Canadian government accepted the request of their residents especially for the new generation. This seems to be the first step to minimize the negative social impact in the society. On the other hand, after New Zealand and Germany legalized prostitution, the violent crime rate decreases dramatically. Therefore, many studies are

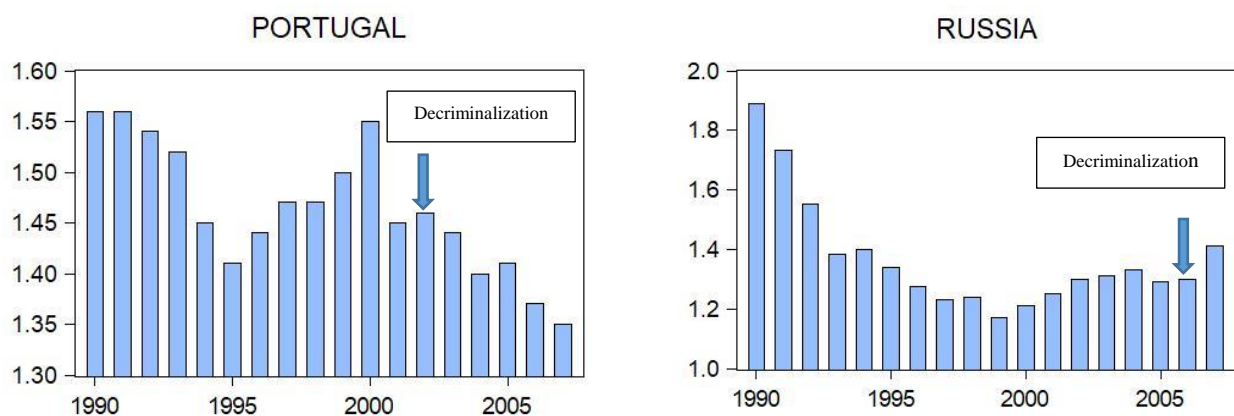
examined based on the positive impacts for those countries that legalized drugs and prostitution on what impact will the legislation brings to the society.

1.2 Problem Statement

In this research paper, we mainly focus on the social impact of legalisation of prostitution and drugs in Latin America and Europe. We attempt to find out what is the impact after the legalisation of drugs and prostitution towards the country.

Does legalization of drugs and prostitution helps to reduce or worsen the social impact faced by every country? Figure 1.3 shows that the fertility rate among population in Portugal and Russia from 1990 until 2007. The decriminalization of drugs started from where the arrow falls. For Portugal, there is a decreasing in the fertility rate in that country after the decriminalization of drugs. The increase in drug use will affect the health and thus cause infertility. (Guarnotta, 2004) On the other hand, Russia decriminalized drugs in 2006 and the fertility rate shows an increasing trend after the decriminalization.

Figure 1.3: Fertility rate among general population in Portugal and Russia



Source: The World bank

Some researcher believe that through legalization, it will reduce the illegal drugs selling in the black market. People will purchase drugs from legal parties instead of dealing illegal with the black market and government can have a better control on the usage of drugs. Drugs such as marijuana, cannabis and nicotine will exposed the drug users to infections and disease such as HIV. The number of HIV patients may increase in the country after the legalization of the drugs because drugs can be easily found and consume everywhere, drugs usage in a nation will growth rapidly.

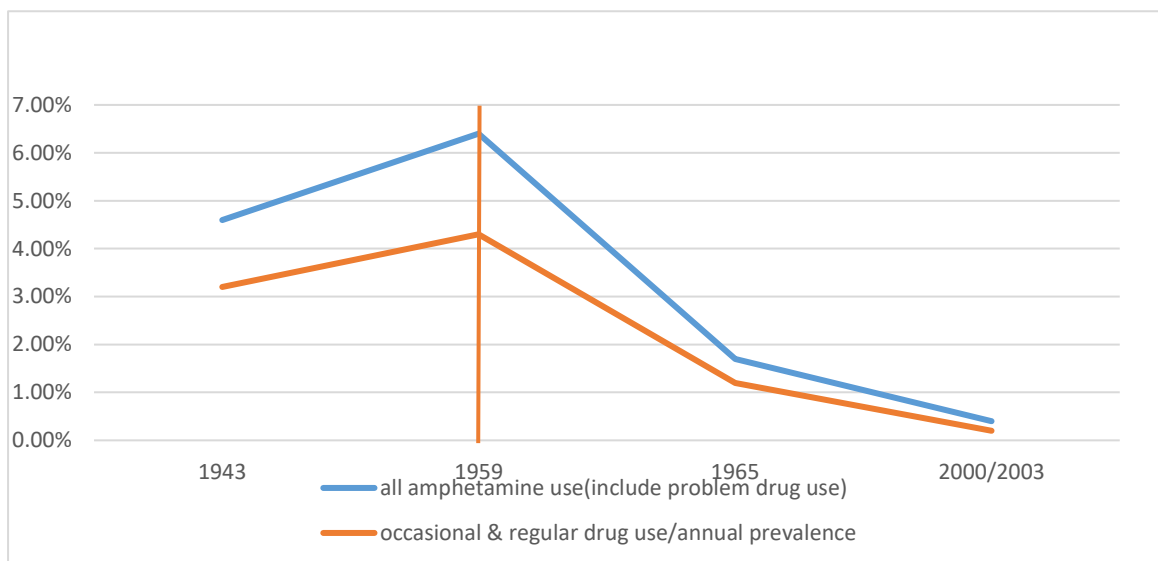
Besides that, there are a lot of failed cases for setting rules and regulations on drugs control. Some economists suggest that it would be better for the government to put more effort on treatment, rehabilitation and education as better policies implementation. In the European region, Sweden ranks the second highest government spending on education and rehabilitation on drug control. However in 1990s, Sweden started to reduce spending on education and rehabilitation and in turn leads to an increase of unemployment and a decline in the country's GDP.

Furthermore, legalization of drugs will not only bring negative impact but positive effect as well. Legalization can be diversified into two categories which are controlled legalization and full legalization. Controlled legalization means that there will have an age limitation, restriction on the amount of drugs purchased and requirement when people want get the drug supplied. This kind of legalization can prevent kids from approaching to drugs through law and regulation (Grant, 2004). Other than that, full legalization of drugs will create a safer environment for the drug user and protect the drug users' rights because the full legalization treat drug user in par with non-drugs user, they will have the rights to be respected and protected.

The graph in Figure 1.4 shows the amphetamine use in Sweden. In 1959, Sweden had decriminalized drugs. We can see that the estimated number of drug use goes up to the peak at 6.4% or 313,000 people in 1959, which carried a comparatively huge number to the global standard. The

highest amphetamine use is from Philippines with an annual rate of 6%. The amphetamine users drop drastically to 0.4% in 2000/2003 for the population age of 15-64. This is due to a gradual restriction of the drug policy after 1968. The drug policy implemented by Sweden has contributed to the huge decline of the number of drug users (Billy, 2012).

Figure 1.4: Drug use among general population in Sweden



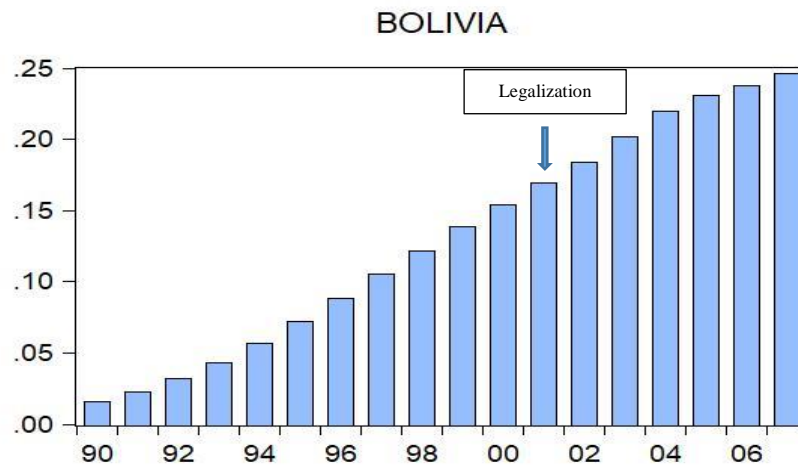
Source: (The Background of the Drug Problem – Use of and Conceptions about Narcotic Drugs in Swedish Medicine, 1939-1965), Stockholm 1994; and UNODC, Annual Reports Questionnaire Data.

From the figure 1.4, the HIV among general population in Bolivia increase after the legalization of prostitution. The possible reason will be there is no strict law and regulation, sex workers might expose to dangerous and terrible working conditions. Therefore, prostitutes will be more likely to face violence crime and increase HIV infection from their jobs.

However, there are some arguments said that legalizing prostitution will reduce the social impacts of a country. Legalization of prostitution allowed the government to control this sector through licensing of business,

registration of prostitute, medical check-up, taxation and regular inspections (Weitzer, 2012).

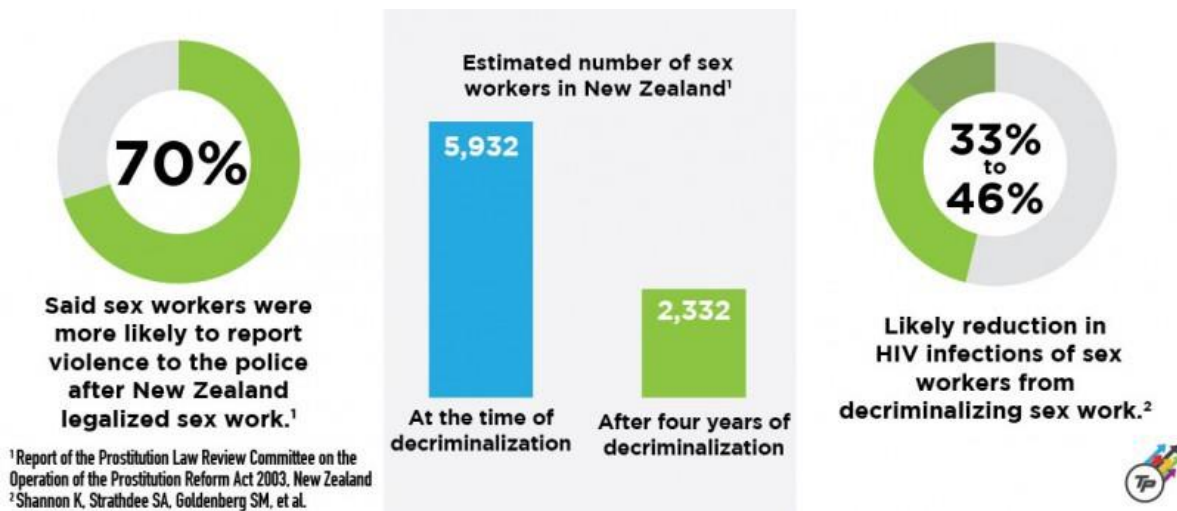
Figure 1.5: The HIV among general population in Bolivia



Source: UNAIDS

Legalization allow brothel to request their clients to use condom when they having sex. This helps in reducing the chances of having HIV diseases in this sector. Prostitutes is protected by the law and regulation, they will choose to report the crime when they are out of the shadows that created by prohibition (Church, 2001; Lowman and Fraser, 1995; Plumridge and Gillian, 2001). If the clients insulted the sex workers, she can seek for help from the police department (Whittaker and Hart, 1996). According to the report of the prostitution law review committee on the operation of the prostitution reform act 2003, 70% of the prostitutes report to the police about the violent cases after the legalization. As a conclusion, fewer prostitutes will be the violent victims after the legalization. The number of prostitute has a significant decrease in New Zealand, from 5932 drop to 2332 after four years of decriminalization.

Figure 1.6: Impact of legalization of prostitution



Source: Report of the Prostitution Law Review Committee on the Operation of the Prostitution Reform Act 2003, New Zealand.

1.3 Research Objective

Against this backdrop, this study intends to investigate the social impacts of legalization of drugs and prostitution in Europe and Latin America from 1990 to 2007.

In particular, this study has those specific goals in succession:

- i. To determine the relationship between abortion and human capital, gross domestic product, family planning and contraceptive prevalence.
- ii. To determine the relationship between fertility and human capital, gross domestic product, family planning and contraceptive prevalence.
- iii. To determine the relationship between HIV and human capital, gross domestic product and contraceptive prevalence.
- iv. To determine the interactive relationship of legalization of prostitution and drugs with abortion, fertility and HIV.

1.4 Research Question

Corresponding to the objectives, there are three main questions this study would address:

- i. What are the impacts of human capital, gross domestic product, family planning and contraceptive prevalence have on abortion, HIV and fertility?
- ii. What are the impacts found on abortion, fertility and HIV after legalization of drugs and prostitution?

1.5 Hypothesis

Below are the hypotheses for our topic:

1.5.1 Abortion

H₀: There is no impact between Abortion and Legalization of drugs and prostitution.

H₁: There is an impact between Abortion and Legalization of drugs and prostitution.

1.5.2 HIV

H₀: There is no impact between HIV and Legalization of drugs and prostitution.

H₁: There is an impact between HIV and Legalization of drugs and prostitution.

1.5.3 Fertility

H₀: There is no impact between Fertility and Legalization of drugs and prostitution.

H₁: There is an impact between Fertility and Legalization of drugs and prostitution.

1.6 Significance of Study

This research project focus on two main issues, which is the impact of legalization towards the country and how it interact with the social impacts by taking the data from 37 countries in Latin America and Europe for the period range within 1990 and 2007.

In previous studies, most of the researcher focuses on the impact of legalization on crime or violence and economic prospective. Our study is contributed to the social impact like abortion, fertility and HIV where previous researcher didn't put much attention on. Most of the researchers conducted their study on developed country such as US and Australia. For our research study, we are concentrating data from Europe and Latin America. The reason is that these countries in the same region are having a similar culture and there is more legalized country compared to other group of countries. Moreover, we will be adding some control variables into our model in order to provide a more reliable result. We can obtain more specific information regarding to the effect of legalization on different variables. By setting the legalization of prostitution and drugs as the interactive term, we are able to obtain the individual effect for each variable after the legalization.

Lastly, this research can provide better guideline for government on how legalization would affect the society in terms of the fertility rate, HIV and abortion rate. Thus, the finding of this research are aim to help the policy makers to understand and concern about the social impact while making a policy implementation's decision.

1.7 Chapter Layout

Chapter one will introduce the topic and provide an overview of the framework and followed by chapter two which will discuss about the review and theoretical model from past studies. Other than that, chapter three will outline the data collected and the methodology used in this research. The coming chapter will discuss on the test conducted and a detailed interpretation of the results will be provided. The final chapter will summarize and draw a conclusion for the research project.

1.8 Conclusion

A brief introduction regarding to our studies had introduced in this chapter. We discussed on the social impacts brings after the legislation of drugs and prostitution in those Europe countries we studied. For the problem statement, objectives, research question, hypothesis testing and significance of study, we will provide a clear picture about the research by identifying the objectives and how to conduct the study.

CHAPTER 2: LITERATURE REVIEW

2.0 Why and Why Not Legalize Drugs and Prostitution?

The legalization of various medical drugs into the society has introduced many social concerns. Notwithstanding a century of prohibition, the legalization of marijuana, cannabis, Anabolic Steroids, nicotine, alcohol and exactas has bring both negative and positive social impacts to the nations. From the aspect of prostitution sector, the exchange of sex services for earning a living has been a long history, many countries are still banning the practice while others tolerate or even permitted the practice in designated locations or only under certain circumstances. The policy of legalizing prostitution has been implemented in numerous of countries. The legislation in this sector has brought different kinds of arguments.

2.1 Decreased in Abortion Rate?

Prostitution should be legalized as some researcher claims that there will be a decrease in the abortion rate. Based on news from the world report of U.S. News, a nation that legalized prostitution-Netherlands carried a lowest rate of abortion and the least teen pregnancy as well. The existence of this divergence is mostly due to various types of credited policies and strategies implemented by the country such as early sex education in schools, promote proper ideology of sexuality through media, and a convenient passageway for contraception. In the Netherlands, abortion will be the last choice. (Kurova, 1998)

Prostitution should not be legalized. According to the U.S abortion history, abortion will be the prostitutes' choice to sustain their job-prostitution. It was found that almost 60,000 sex workers are hired in the

America under an unsafe circumstances where there are minimum contraceptive prevalence and nimity sexual practice which has been estimated for around 30 to 40 times per week which consequently leads to a redundant pregnancy. Based on the U.S. abortion history report, prostitutes will rather choose to abort than giving birth in order to sustain their retain their high paid job with less “work” to be done. (Fact About Abortion: U.S. Abortion History, 2012). Not to mention that the prostitutes are highly feeble to sexual transmitted diseases such as HIV and AIDS, unplanned or undesired pregnancies has always been the mourning tribulation for them which in turn causes more abortion.

2.2 Reduce HIV/AIDS?

Legalized drugs should be practiced since it helps to reduce HIV/AIDS. A group of medical professions are anxious about the propagation of HIV/AIDS and intended to control this situation through the needle-sharing of intravenous drug users. The president of Australian Medical Association (AMA) from Victorian branch, Dr Whiting claims that legalizing of heroin works as a tool to control the propagation of HIV/AIDS (Guen, 1992).

Proponents believe that the legalization of prostitution will reduce the HIV prevalence or other sexual transmitted disease. Variety of journals has stated that legalized prostitution will protect the prostitute from HIV. There was a negative relationship between legalized prostitution and HIV prevalence. According to Goldberg (2014), he argued that legalized prostitution could reduce HIV infection for as much as 50% which it subsequently became a strong initiative for the legalization of prostitution in a country. Researchers at the 20th International AIDS Conference conducted a study on the HIV prevalence among sex workers in Canada, India and Kenya. The result shows that the HIV infection reduced for 33% to 46% when prostitution is legalized in those countries. Individual who intend to enter to the brothel market are required to undergo tests for HIV, syphilis,

gonorrhoea and chlamydia, once the all of the tests are passes, they can start to work. She must continue to get HIV and syphilis tests every month and the other 2 tests weekly.

This regular health check-up gave prostitutes the pledge from any sexual transmitted diseases (Rayborn, 2013). According to the strict health requirement from legal prostitution market in Nevada, prostitutes have to ask for their patron to put on a condom before contacting of their genitals. And it is proved that the rate of HIV and AIDS prevalence in Nevada's legalized prostitutes is zero percent (Rayborn, 2013). Woman could have further control over their body and are able to choose which clientele to embark with, as well as making sure that their clientele themselves is free from any communicable disease (Day, Ward & Perrotta, 1993, See also, Ip, 2005).

Legalization of drugs such as marijuana, cocaine and heroin should not be practiced. The boosting of HIV/AIDS is mostly due to the sharing of unsanitary needles. Researcher claims that legalization of drugs helps to decrease the dirty needles and addiction (Hood, 2015). While other researcher denoted that sexually transmitted disease such as HIV/AIDS are frequently infected by addicts and regular user due to the decline of immunity function and the unsafe sexual practices (Guen, 1992). Some studies have shown that both men and women who regularly smoked crack are more likely to be infected. This has been proven because of the highly addictive nature of the individuals where most of them will commit themselves in crime to generate income such as commercial sex work in order to support their fondness (Desimone, 2001). The research found that the HIV prevalence rate between crake-smoker and non-crack-smoker are highly different where the highest HIV prevalence rate for crack-smokers is around 30% in New York and 23% in Miami. 30% of crack-smokers who exchanged sex for drugs were infected by HIV and only 9% of non-crack-smoker is infected for HIV (Cunningham, 2007).

Adverse researches do not agree with the legislation of prostitution. It claims that women who work longer time in the brothel sector are more likely to be infected with HIV. Various studies over the world stated that

around half of all johns intend or insist not to put on condom as prevention. This circumstance has highlighted that even with the existence of safety policy in brothel, women are not fully protected from harm (Farley, 2009, See also, Karlebach, 2008).

2.3 Reduce Fertility Rate?

Legalization of drugs will only bring negative effect to the fertility rate and hence this policy should not be practiced. Based on previous study, it claims that female drinkers and drugs addicts are more likely to undergo fertility problems as compared to low and moderate drinkers. On the other hand, men who use marijuana and cocaine may undergo the changes of hormones that affect the sperm movement which lead to an infertility. For instance, the performance-enhancing drugs will increase the testosterone levels in the blood cycle which subsequently leads to fewer amounts of hormones produced, and causes a shrink of testicles and lesser sperm. In conclusive, individuals who get addicted or influence of drugs and alcohol are more likely to put themselves in a dangerous circumstances where they will have to bear a higher risks of infertility (Guarnotta, 2004).

There are few arguments on previous studies conducted by researchers. Some studies stated that legalization of prostitution will not affect the fertility rate. However, others studies mention that legalized prostitution may lower the fertility rate. Saha and Bairagi mention that those country that have legalized the prostitution are not necessary facing a situation where there is an increase in the fertility rate. Even when the contraceptive prevalence rate is high, there might be an inconsistency trend in the fertility rate. The increase or decrease in the fertility rate was not merely based on the legalization of prostitution where it also take into account of other factors such as family size, the preferences of the number of child wanted, or parental concern (Saha & Bairagi, 2007).

2.4 Reduce Crime Rate?

Legislation of prostitution has to put into practice. Prostitutes are less likely to become a crime victim after the legalization of prostitution (Long, 2012). According to Bowen (2013), when the prostitution is legalized, there will be a decrease in crime. This is because when prostitution is legalized in the country, those prostitutes will enter freely in this market and they will be protected by law. The violent-crime prevention such as police forces will be intervening in this field in order to protect those prostitutes who are accounting with crime cases. When the crime occur, prostitutes claimed to be legal will have the right to sue the perpetrators through judicial system (Cussen and Block, 2000, See also, Dreyfus, 2013). Prostitute victims can hardly seek for protection from law enforcement before the legislation of prostitution, thus those perpetrators take it for granted to commit crime (Bowen, 2013). The statement that prostitution is bound with crime has been lessening because crimes often occur in the first place due to illegal prostitution (Rayborn, 2013).

Human trafficking in prostitution sector has significantly drop since brothels can recruit among domestic women legally, this make the women trafficking less attractive (Cho, 2013, See also, Abrol, 2014). The safety of brothels and prostitutes are more guaranteed after legalize of prostitution as the business are claim to be legitimate, a formation of union is thus occurred, where the safety for prostitutes are promoted better (Day, Ward & Perrotta, 1993). The Netherlands, a country with everything is authorized with its legalized prostitution baited and facilitates human trafficking from the rest of the world is a myth. The nation's government has come out with the new legislation by the Dutch authorities to diminish the human trafficking (Siegel, 2009).

The legalization of drugs should be exercise. Based on a study executed in the Journal of Economics, there was a decline of 8% to 11% in traffic fatalities after one year of the legalization of medical marijuana with more individual tested positive to marijuana. Besides, the author also sum up

that there were a remarkably decrease in alcohol consumption which leads to a higher rate of traffic fatalities (Scherf, 2015). David suggested that alcohol and marijuana are substitutes (Trilling, 2016). Furthermore, Portland is a fascinating example due to its boundary with Washington. From year 2012 to 2014, the use of marijuana in Portland is strictly forbidden while the sales and use of marijuana are wholly legal in neighbouring country-Washington. From this, the researcher examined no spill over effects in Portland where the sales of marijuana there did not generate a rising crime rates across the border. The research shows that there are no perceptible changes in the trend of crime before and after the legalization of marijuana (Dills, Goffard, & Miron, 2016). Legalization of medical drugs have to put in practice because the prohibition of drugs like marijuana does not decrease Americans to stop using illegal drugs but successfully caused a black market violence and street crime (Ostrowski, 2014).

Legalization of prostitution should not be practice. Studies shows that children prostitution has heighten drastically in Netherlands during the 1990s after prostitution are being legalized. The Amsterdam Children Right organization forecasted an increased in the number of child prostitutes by more than 300% from year 1996 to 2001 (Farley, 2009). Another study reported a larger human trafficking where sex business did this to meet with the demand of prostitutes in legal brothel. Hughes denoted that there will be a regional increase of human trafficking wherever the legalization of prostitution is being practice (Hughes, 2007, See also, Ip, 2005; Raymond, 2003; Bharti, 2013). There are cases that Thai women are being bought back to Victoria and work as a prostitute under contract. Their passports and income are being denuded until the contract ended (Sullivan, 2000). Commonly, human trafficking is reported in a higher degree in countries with legalized prostitution. Legislation of prostitution has caused a flourishing human trafficking in this case (Neumayer, 2012).

A “Sneep Case” still exist under legalized prostitution where sex trafficking are traded under the circumstance of legislation of prostitution. German pander brigade to their neighbour country-Amsterdam, Netherlands and took over majority of the red light district by using affectionate relation

or inexorable violence to compel women for sex trafficking and hand over their earnings (Huisman, 2014). To this extent, around 2/3 of brothel in the Amsterdam's Red Light Street has been closed down due to uncontrolled organized crime. (Raymond, 2003) Another research in Denmark shows that the human traffic prevalence increased dramatically over the decade after the decriminalization of prostitution in year 1999 (Dreher, 2012). A study from Nevada and Australia proved that the legalization of prostitution has brought up a "prostitution culture". This issue resulted in an increased case of sexual harassment.

Prostitutes are claiming to be the most raped group in the world and they claim that it is a "paid rape" to them. Even with paying for the sex service, all those kind of insulting sex acts are unnecessary (Farley, 2009, See also, Bernstein, 1999). However the legalization of prostitution has not decrease the spiracle and wretched terrain accounted by women in the brothel sector. In New Zealand, sexual harassment is still being report after the legalization of prostitution (Brunton, Fitzgerald & Abel, 2007).

The legalization of drugs should not be practice. Drug user robbery victim may choose to commit in in violence crime towards the robbers rather than reporting to the police (Yablon, 2011). Roxane Le Guen stated that the occurrence of road accident will be multiply under the influence of drugs such as heroin (Guen, 1992).

2.5 Improve Public Health?

Legalization of drugs is a good view where legalized drugs like cannabis will in turn decrease the use of heroin. The increasing use of cannabis is less health threatening compared to the side effect from heroin. The reduction of drug related death and blood-borne viruses have improved the public health in 2011 (Hughes & Stevens, 2007). Cannabis is an anti-cancer clinically proved element that will slow down the reproduction of cancer cells (Hood, 2015). The end of prohibition with the harm-reduction

trails of tobacco and alcohol can impede death as well as improve public health (Falconi, 2013). Furthermore, the recorded in Portugal's drugs use denoted that decriminalization of drugs do increase in drugs use but ironically, a reduced of drug related public health problem (Hughes & Stevens, 2007). The consumption of hard core drugs like narcotics went down after the legalization of drugs since user have no need to find nonuser to sell to and able to sustain their habit (Hood, 2015). Drug usage might be sustained or even dropped after legalized of drugs because some people purposely do it to break the law (Gardner, 2002).

The policy of legalization of drugs should not be accepted. Other researchers found that legalization of medical drugs should not be practiced. Colorado made national news related to residents', tourists', and newscasters' overconsumption of edible marijuana products after legalized marijuana (Ghosh, Maffey, Whitley, Erpelding & Wolk, 2016). The rising availability to gain access to marijuana, particularly in edible products may put children's health at risk. Numbers of studies proves that excessive intake of marijuana may increase the level of depression, anxiety and unhealthy drug abuse as well as a long-lasting cognitive dissonance (Dills, Goffard & Miron, 2016). Legalized medical marijuana can caused a greater misuse of marijuana due to its increased availability in term of recreation purposes (Cerdá, 2012).

Increasing marijuana users are drove by the changes in price after legalize of medical marijuana and it is obvious that marijuana initiation among youth is heaps sensitive to the decreasing price (Pacula, 2010). Jeffrey Miron found measure the standardized test achievement in terms of reading aptitude of Washington State's the 8th and 10th graders and found no positive and negative major effects caused by the legalization of marijuana, thereby signifying there is no considerable changes between legalization of marijuana and testing performance (Miron, 2016). Legalization of drugs in fact broadens up the drug related death. A medical research with monkey proved that they will constantly consume cocaine until death given unlimited access (Lawn, 1990). A countable numbers of heroin addicts die in their early age due to an overdose. Some argued that young people committed in overdose legally acquired alcohol and have been proved by present cases when heroin

is legalized (Guen, 1992). Last but not the least, youths' creativity and productivity have potentially loss due to drug addiction. Some argued that only an uncaring society will legalize lethal drugs for the intention of saving costs for prohibition enforcement (Guen, 1992).

2.6 Hypothesis Development

After reviewing variety of the studies, we found that there are no specific results whether legalizing drugs and prostitution will bring positive or negative impact to the society. There are different arguments on the issues or pros on the legalization of both drugs and prostitution from distinct perspective which is abortion rate, HIV/AIDS infection rate, fertility rate, crime rate and public health. Therefore, we will be conducting this study to investigate the social impacts of the legalization of drugs and prostitution in a nation. We had collected the sample data based on two different regions which is Europe and Latin America to find out the positive or negative social impacts after the legalization of drugs and prostitution.

Furthermore, this study will lighten up the social impacts and provide ways to reduce possible negative social impacts when drugs and prostitution are legalized. The social impacts we have been chosen in this study is abortion rate, fertility rate and HIV prevalence rate. We are interested to find out how legalization of drugs and prostitution will bring towards these 3 variables and focusing on 37 countries from Europe and Latin America region. We will take into account of other variables that might affect the dependent variables as well, which are human capital, gross domestic product, family planning and contraceptive prevalence. Moreover, two controlled variables are being added in order to increase the reliability of our research. The two controlled variables are freedom of religion and human development index.

CHAPTER 3: METHODOLOGY

3.0 Introduction

In this chapter, we will use Eviews 9 to conduct all the tests by using the data collected from various sources. In this research, we use panel data to carry out the test because we are interested in finding out the social changes over time and the impacts on the variables after legalisation of the prostitution and drugs. We will conduct a pre-test which is unit root test. After the test, we will choose the best model to meet and answer the research questions stated in chapter 1.

3.1 Breaking Down The Model

3.1.1 The model

In this research, we would like to study about the social impacts of legalization of drugs and legalization of prostitution towards Abortion, Fertility and HIV. We include legalization of drugs and legalization of prostitution as interactive term into our model to see how it affects Abortion, Fertility and HIV through the variables. Hence, we will observe the relationship between the explanatory variables and dependent variables. Equation 3.1 is shown below.

$$y_{it} = \alpha_0 + \beta_1 DHC_{it} + \beta_2 DLOGGDP_{it} + \beta_3 FAMPLAN_{it} + \beta_4 LCP_{it} + \beta_5 FRN_{it} + \beta_6 HDI_{it} \gamma' + X_{it} \times D_j + \mu_{it} \quad (3.1)$$

Where y_{it} denotes dependent variables which comprises of Abortion, Fertility and HIV; i denotes the number of countries; t refers to number of period; α_0 refer to intercept; β_n where n represents 1,2,3,4,5 and 6; DHC_{it} is first difference human capital; $DLOGGDP_{it}$ is first difference log gross domestic product; $FAMPLAN_{it}$ is family planning; LCP_{it} is log contraceptive prevalence; FRN_{it} is freedom of religion; HDI_{it} is human development index ; X_{it} is independent variables which comprises of human capital, gross domestic product, family planning, contraceptive prevalence, freedom of religion and human development index; $\gamma' =$ vector of coefficients; D_j is {legalization of drugs, legalization of prostitution}; $\mu_{it} =$ error term with IID $[0, \sigma^2]$

Based on equation 3.1, we compounded the equation into three different models. The dependant variable for the first equation is abortion with the four independent variables which is human capital, gross domestic product, contraceptive prevalence, family planning and two control variables which is freedom of religion and human development index. The dependant variable for the second equation is fertility with the four independent variables which is human capital, gross domestic product, contraceptive prevalence, family planning and two control variables which is freedom of religion and human development index. The dependant variable for the third equation is HIV with the three independent variables which are human capital, gross domestic product, contraceptive prevalence, family planning and two control variables which is freedom of religion and human development index.

3.2 How Does The Model Work?

3.2.1 Fertility

The equation below shows how legalization of prostitution of drugs changes fertility rate. In this equation, legalization of prostitution and drugs will act as an interactive term which interact with the explanatory variables that in turn influencing fertility. We will discuss about the before and after impacts of the legalization of prostitution and drugs. Equation 3.2 shown below indicates the impacts of legalization of prostitution and drugs towards fertility rate.

$$\frac{dy}{dx} = \beta_n + \gamma' D_j \quad (3.2)$$

Where $\beta_n > 0$; γ' is vector of coefficients; D_j indicates {legalization of drugs, legalization of prostitution}

Increasing usage of contraceptives will induce a low fertility rate (Westoff & Akinrinola, 2001). Legalization will further decrease fertility as prostitutes are being controlled by pimps and brothel owners through contraceptives (Tremayne, 2001). Less educated individuals tend to have higher fertility (Nargund, 2009). When there is legalization, fertility will decrease further because regulations will be made to prevent them from getting pregnant. Apart from that, fertility is found to be lower in developing and developed countries (Nargund, 2009). After legalization, gross domestic product will increase as it contributes to part of the economy leading to a further decrease in fertility (Goldman, 2012).

When people practice family planning voluntarily, fertility rates tends to reduce (Bailey, 2013). However, after legalization of prostitution, there

will be an increase in fertility as women are too embarrassed to buy condoms because they do not want to be perceived as prostitutes (Farmer et al., 2015). Religious people tend to have higher fertility rate because they will never reject god's gift- children (Hayford & Morgan, 2008). When legalization comes in, fertility will decrease as there are tons of procedures that prostitutes and clients need to follow. For women that have positive economic prospects, motherhood will be prevented or delayed leads to a low fertility (Baudin, 2015). After legalization, health index will improve and hence, lead to a higher human development index. Thus, fertility will decrease further.

Higher usage of contraceptive will caused lower fertility rate (Westoff & Akinrinola, 2001). When drugs are being legalized, it will increase the fertility as women who injected drugs are found to be using contraceptives. When drugs are legalized, it would help them to get rid of the addiction through rehab and they can have children easily with no worries (Olsen, Banwell & Madden, 2014). High educated people tend to have lower fertility (Nargund, 2009). Students and less educated individuals are found to be drug addicts, with legalization, fertility will increase with the help of the rehab centres as drug addicts can continue with studies and to have children after being cured from drug addiction (McCaffrey, Pacula, Han & Ellickson, 2010).

Gross domestic product is negatively related with fertility (Nargund, 2009). When drugs are legalized, fertility will decrease further as legalization of drugs will contribute to the country's gross domestic product which will induce higher standard living and people will choose to work for a greater income instead of expanding their family (Miron, 2014). Family planning is negatively related to fertility rate (Bailey, 2012). However, when drugs are being legalized, fertility will increase as people will not worry about their children to become a drug addict or selling drugs illegally because there will be proper procedures for them to approach for drugs. Human development index is negatively related to fertility (Baudin, 2015). Fertility will decrease further when drugs are being legalized. This is because human development

index will increase as people will have a longer life expectancy and also a better quality of life after being cured from drug addiction (Miron, 2014).

3.2.2 HIV

Equation below explains how legalization of prostitution and drugs will bring changes to HIV. We set legalization of prostitution and drugs as interactive term where it interacts with the explanatory variables to influence HIV. We will then discuss about the before and after impacts of legalization of prostitution and drugs on HIV. Equation 3.3 shown below indicates the impacts of legalization of prostitution and drugs on HIV

$$\frac{dy}{dx} = \beta_n + \gamma' D_j \quad (3.3)$$

Where $\beta_n > 0$; γ' is vector of coefficients; D_j indicates {legalization of drugs, legalization of prostitution}

People can get infected with HIV through sexual intercourse and therefore, they are encouraged to use contraceptives to reduce the spread of HIV. When prostitution is legalized, HIV prevalence will decrease further as contraceptives is a must to protect prostitutes (Albert, Warner & Hatcher, 1998). When it comes to human capital, the one with higher level of schooling tend to be more aware about sexual risk and that contributes to low HIV prevalence (Walque, Nakiyingi-Miir, Busingye & Whitworth, 2005). The less educated one tend to be prostituted, so with legalization though it will not affect the high educated one but in a way HIV prevalence will decrease further (McClanahan, McClelland, Abram & Teplin, 1999). Low HIV prevalence is associated with high gross domestic product as high income nation tends to spend more in curbing HIV (Essig, Kang & Sellers, 2015). Legalization will make everything legal in prostitution prospect where in turn their income will be taxed and contributes to the country's gross domestic product (Mathieson, Branam & Noble, 2015). Higher gross

domestic product will increase funding in HIV and further reduction in HIV prevalence (Ávila, Loncar, Amico & De Lay, 2013).

People who follow religious teachings are significantly associated with lower HIV prevalence (Speakman, 2012). However, there is no conflict between religion and prostitutes as they have work in order to earn for a life (Sorajjakool & Benitez, 2015). They will only be protected after prostitution is legalized and it leads to a further decrease in HIV prevalence. Human development index and HIV are negatively related because HIV tends to be more modish in poor countries (Doosti-Irani, Cheraghi & Doosti-Irani, 2015). With legalization, Human development index increases as income and health index will increase as there will be more medical follow-ups (Hammarstrand & Sundsmyr, 2013). Hence, there will be a further reduction in HIV prevalence.

People who use contraceptives will have lesser exposure to HIV (Center et al., 2016). People who inject drugs will tend to get infected with HIV and the contraceptives usage among them will be high because they will not want children as they do not want them to get infected (Tan, Kapiga, Knoshnood & Bruce, 2015). However, there will treatment and rehab for drug addicts after legalization. Hence, there will be a further reduction in HIV as they can have healthy children. The less educated ones are found to be associated with HIV (Walque, Nakiyingi-Miir, Busingye & Whitworth, 2005). Less educated ones also consume drugs and some of them are students. After legalization, human capital will increase as students can continue studies after treatment and rehab (McCaffrey, Pacula, Han & Ellickson, 2010). However, it will not bring much impact in reducing HIV as there is no cure for those who are HIV positive.

Low income nation will have higher HIV prevalence (Essig, Kang & Sellers, 2015). However, legalizing drugs will increase gross domestic product as the sales of drugs will be counted as part of gross domestic product and government will have more money (Hajizadeh, 2016). With the

extra money, the government will provide more funds to curb HIV and HIV prevalence can be reduced. Lesser freedom of religion will expose lesser to HIV (Speakman, 2012). The impact of legalization towards HIV is no impact. No impact is because religious people will not agree with legalization. Countries with lower human development index tend to have higher HIV prevalence (Doosti-Irani, Cheraghi & Doosti-Irani, 2015). High human development index tend to have higher drug consumption rates (Silva et al., 2014). With legalization of drugs, it would improve human development index and the HIV prevalence will decrease further.

3.2.3 Abortion

Equation 3.2.3 shows how legalization of prostitution and drugs gives impact towards abortion. In here, legalization of prostitution and drugs will act as interactive term where it will interact with the explanatory variables to influence abortion. Based on the equation below, we will discuss about the before and after impacts of legalization of prostitution and drugs towards abortion. Equation 3.4 shown below indicates the impacts of legalization of prostitution and drugs towards abortion rate.

$$\frac{dy}{dx} = \beta_n + \gamma' D_j \quad (3.4)$$

Where $\beta_n > 0$; γ' is vector of coefficients; D_j indicates {legalization of drugs, legalization of prostitution}

High contraceptives usage will lead to a lower abortion rates as unwanted pregnancies can be prevented (Lamina, 2015). When prostitution is legalized, abortion rates will decrease further because there will be a significant increase in contraceptives usage. People with more years of schooling tend to be associated with abortion and vice versa (Rao & Bouvier, 1974). Legalization will decrease the abortion rates as unwanted pregnancies among prostitutes can be prevented. Families will decide not to abort if they are financially stable even though it is an unwanted pregnancy (Lima et al.,

2016). With legalization of prostitution, GDP will increase as it will be considered as part of the tax revenue (Hajizadeh, 2016).

Family planning will reduce unwanted pregnancies and hence, lower abortion rates. However, when legalization comes in, it will increase abortion rates due to peoples' perception. Abortion is forbidden in religion's perspective and therefore, religious people will not opt for abortion (Hedayat, Shooshtarizadeh & Raza, 2006). As there is no conflict found between religion and prostitution, legalization will further decrease the abortion rates. High human development index will bring a low abortion as lives are being saved from premature death are taken into account of life expectancy. Legalizing prostitution will contribute to a higher human development index and in turn a decrease of abortion rates (Fondation Scelles & Charpenel, 2012).

3.3 How Do We Collect And Process Data?

3.3.1 Data collection method

Our study is done based on secondary data that utilized panel data from various resources such as World Bank, World Health Organization, United Nation Development Programme, UNAIDS, Cepal and The QOG Basic Dataset 2017.

3.3.2 Data sources

Our data comprises of yearly data of fertility rate, abortion rate, HIV prevalence, human capital index, GDP per capita, contraceptive prevalence and total demand for family planning. We used freedom of religion in

constitution and human development index as our control variables which may bring impact to the dependant variables that we are studying.

3.3.3 Data collection method and data processing

The time period covered in this dataset is from years 1990 to 2007. We cover a set of total 38 countries in this paper, 18 countries from Europe countries and 21 from Latin America. Initially, we started with the searching of relevant data. The abortion rate is collected from abortion statistic, whereas the data for fertility rate, human capital and gross domestic product are extracted from the World Bank. Other variables' data are extracted from different resources where HIV prevalence's data are collected from UNAIDS, family planning's data from Cepal, contraceptive prevalence from World health organization, freedom of religion's data from The QOG Basic Dataset 2017 and human development index's data from United Nation Development Programme.

We add in log term for contraceptive prevalence and GDP. The reason we log this two variables is to minimize the gap between these two variable and others variable. The data set value for these two variables is too big compare to others variable and if the gap is too big we might get spurious result. Besides, we conduct a unit root test for the purpose of testing whether each of variables is stationary or non-stationary to avoid spurious result. We differentiate human capital index and GDP because the data sets are non-stationary, in order to solve this problem we used the 1st difference method to transform the data into stationary form. Furthermore, we added in 2 dummy variables which enter to the regression model in an additive way but in turn it does work. Finally, we add in the interactive term into the regression model in a multiplying way, subsequently, we are able to observe the impact or difference before and after the legalization of drugs and prostitution.

Table 3.1: Summary of Variables and Data Sources

Variables	Indicator name	Unit measurement	Source of data
Legalization of Drug	LegalDrug	1 and 0	Procon.org
Legalization of Prostitution	LegalPros	1 and 0	Procon.org
Abortion	ABOR	Per 1000 women	Abortion statistics
Fertility	FERT	Birth Per women	World bank
HIV	HIV	Prevalence	UNAIDS
Human Capital	HC	Years of schooling and return to education	World bank
Family Planning	FAMPLAN	Total demand for family planning (%)	Cepal
Contraceptive prevalence	CP	Prevalence	World health organization
Gross domestic Product	DLGDP	Per capita	World bank
Freedom Of Religion	FRN	Rank	The QOG Basic Dataset 2017
Human Development Index	HDI	Percentage (%)	United Nation Development Programme

3.4 Constructing Basic Models

3.4.1 Pooled OLS

We are using panel data in our research where it make it viable to observe the time effect or time-specific effect in the data. In this study, we will run 3 panel data model to find out the best model to fit our data. Firstly, we run our data by using Pooled OLS method. OLS model work best to produce efficient and consistent estimates when there is no individual effects exist. Pooled OLS will estimate all of the observation together as a whole, which ignoring the cross-section and the time series nature of the data. For example, all the country chosen is the same and has the same properties.

There are five assumptions to be fulfilled in OLS model. It will assume that the model is linear and have erogeneity which means that disturbances does not correlated with any of the regressors. Other than that, the model is required to have a constant variance of error term, variability in the same value to be fixed and no multicollinearity. If there is individual effects, heterogeneity problem such as country personality will not be captured in the regressors. This will lead to the violation of assumption and OLS may not be the best fit model. According to our model, after conducted the test, we found out that the Pooled OLS may not be the best model to fit our panel data. This mean that the data are not homogeneous and thus other regression methods like Fixed Effect Model (FEM) or Random Effect Model (REM) may be more suitable for the data. The Pools OLS equation is shown below.

$$y_t = \alpha_0 + \beta' X_t + \mu_t \quad (3.5)$$

Where y_t denotes the dependent variables which comprises of Abortion, Fertility and HIV; t refers to number of period; α_0 is intercept; β' is $n \times 1$ vector of coefficients; X_t is vector of variables which comprise of human

capital, gross domestic product, family planning, contraceptive prevalence;
 μ_t is error term with IID $(0, \sigma^2)$

3.4.2 Fixed effect model

Fixed effect model is a statistical model that used whenever we are interested in analysing the impact of variables that vary over the time. By using this model, we are allow to impose the time independent effects for each variable that are possible correlated with the repressors. The function of FEM model is to control the problem of heterogeneity and make it to be constant over time and correlated with independent variable.

FEM model also known as Fixed Effect Least Squares Dummy Variable (LSDV). The model can reflect unique characteristics of individual units with using dummy variable by using the intercept in the regression model.

We assume that the individual may affect or bias thee predictor or the result for the variable and this is the rationale behind the assumption of the correlation between errors term and predictor variables. We are able to access the net effect of the predictors on the outcome variable with using FEM by remove the effect of those time-invariant characteristics.

Besides, FEM also assumes that time-invariant characteristics should not be correlated with other individual characteristic, each individual must be unique. Each principle is different from others and therefore the error term and the constant (which captures individual characteristics) should not be correlated with others. Once we found that one of the error term is correlated with others, then FEM is no longer suitable since inferences may not be correct and we need to model that relationship (probably using Random-Effects Model), and this is the main rationale for the Hausman Test. The equation for FEM is shown below.

$$y_{it} = \alpha_i + \beta' X_{it} + \mu_{it} \quad (3.6)$$

Where y_{it} denotes the dependent variables which comprises of abortion, fertility and HIV; i refers to the number of countries and t is number of period; α_i is fixed intercept; β' is $n \times 1$ vector of coefficients; X_{it} is vector of variables which comprises of human capital, gross domestic product, family planning and contraceptive prevalence; μ_{it} is error term with IID $(0, \sigma^2)$

3.4.3 Random effect model

The concept of the Random Effect Model (REM) is that the intercept is random with a constant mean value. REM will only be used when the panel data are assumed to have no fixed effect. REM can also be known as Error Component Model. The difference of REM from Fixed Effect Model (FEM) where it does not only estimate a single estimation at a time but estimations will be randomly drawn from large population. Therefore, in REM, only the mean distribution of effect will be taken into account instead of a single effect. This will be the advantage of REM where there are more degrees of freedom.

However, there is one condition applies to it that is the independent effect should not be correlated with any regressors and estimate error variance. There are some explanatory variables that are constant over time that is hard to estimate but when it comes to Random Effect Model, the coefficients of the explanatory variables can be estimated. Apart from that, the time invariant variables can also be included in REM where they will not be absorbed into the intercept like FEM. The equation for REM is shown below.

$$y_{it} = \alpha_0 + \beta'X_{it} + \mu_{it} + V_{it} \quad (3.7)$$

Where y_{it} denotes the dependent variables which comprises of Abortion, Fertility and HIV; i is the number of countries and t = number of period; α_0 is random intercept; β' is $n \times 1$ vector of coefficients; X_{it} is the vector of variables which comprises of human capital, gross domestic product, family

planning and contraceptive prevalence; μ_{it} is error term with IID $(0, \sigma^2)$; V_{it} represents error term.

3.5 How Preferred Model Is Chosen?

After constructing the basic models for our dependent variables, we will proceed to choose the preferred model for each dependent variable. Therefore, in this section we will discuss on how we choose the preferred model based on Likelihood Ratio test, Lagrange Multiplier test and Hausman test.

3.5.1 Likelihood ratio test

Likelihood ratio test is a most common approach to face with a new testing problem. The purpose of conducting this test is to estimate the Pooled OLS and Fixed Effect by comparing the likelihoods of this two models and to see whether this different would be statically significant. F-test is used to determine and decide between Pooled OLS and FEM. It also determine whether there is common constant or different constant, thus, we decided to use Pooled OLS or FEM.

Test Statistic for LR-Test:

$$\text{Test Statistic: } F = \frac{(ESS_R - ESS_U)/(N-1)}{ESS_U/((T-1)N-K)} \quad (3.8)$$

Where ESS_R denotes the residual sum of squares under the null hypothesis, ESS_U the residual sum of squares under the alternative, $N - 1$ and $(T - 1)N - k$ refer to the degree of freedom.

Hypothesis:

H₀: There is no Fixed Effect (OLS is more preferred)

H₁: There is Fixed Effect (FEM is more preferred)

By performing this test, we are able to know that whether Pooled OLS or FEM is a preferred model. If null hypothesis is rejected, we will choose to use FEM model as FEM model is significantly fitter than Pooled OLS.

3.5.2 Breusch and pagan lagrange multiplier test

The Lagrange Multiplier test (LM) is used to choose the best model by comparing the two models which is Pooled OLS and REM. This test is used to test for the heteroscedasticity. LM test is used frequently because the test statistic can be calculated easily and number of alternatives can be covered by the test.

Test statistic: R^2 , N refers to the number of observation

Hypothesis:

H₀: No Random Effect (Pooled OLS preferable)

H₁: Random Effect (REM preferable)

When there is individual effect, REM is preferred and the null hypothesis will be rejected. When there is no individual effect, Pooled OLS is preferred if we do not reject the null hypothesis.

3.5.3 Hausman test

Hausman test is used to discriminate between two models to see which model is statistically significant. This method is commonly in empirical panel data analysis. It compares between Random Effect Model (REM) and Fixed Effect Model (FEM) respectively. In this test, the consistency of an estimator compared to the alternative, the less efficient estimator that already known to be consistent is being evaluated. The GLS estimates are inconsistent if there is a presence of correlation between the individual effects and the regressors whereas the OLS fixed effects results are consistent. However, there is also one condition which makes the OLS fixed effects estimator inefficient that is when the fixed effects and the regressors are not correlated but both estimators are still consistent. Hypothesis testing for Hausman test is shown below.

$$\text{Test statistic: } H = (\hat{\beta}^{FE} - \hat{\beta}^{RE})[Var(\hat{\beta}^{FE}) - Var(\hat{\beta}^{RE})]^{-1}(\hat{\beta}^{FE} - \hat{\beta}^{RE}) \quad (3.9)$$

Hypothesis:

H₀: REM are consistent and efficient (REM preferable)

H₁: FEM are consistent and efficient (FEM preferable)

Based on the above hypothesis testing, if the p-value is found to be less than the significance level of 1%, 5% or 10%, the null hypothesis will be rejected. This indicates that FEM is preferred with higher consistency. On the other hand, when the null hypothesis is not rejected, this means that REM is preferred with higher efficiency.

3.6 Conclusion

We conclude that there are few tests in the chapter of methodology. They are Unit Root test, Likelihood Ratio test, Breusch and Pagan Lagrange Multiplier test and Hausman test. After conducted all of these tests, we will proceed to empirical testing in Chapter 4. In the coming chapter, we will look on how to run the tests stated in this chapter and observe the output and results.

CHAPTER 4: DATA ANALYSIS

4.0 Unit Root Test

Unit Root test is used to test the stationarity of the variables. Stationary means that the data itself is not related to its past which also means it will not get affected by its past. Therefore, we conduct Levin, Lin and Chu and ADF Fisher unit root tests as a pre-test. This test is also conducted to avoid spurious problem. The Unit Root test results are shown in the table below.

Table 4.1: Unit Root test

	LLC	ADF (Fisher)
	Level	Level
	Intercept	Intercept
ABOR	-3.8037*** (0.0001)	74.6433*** (0.0004)
FERT	-6.10927*** (0.0000)	155.701*** (0.0000)
HIV	-9.83746*** (0.0000)	154.545*** (0.0000)
DHC	0.46093 (0.6776)	60.7122 (0.8664)
DLOGGDP	-9.06614*** (0.0000)	209.766*** (0.0000)
LOGCP	-16.8660*** (0.0000)	481.218*** (0.0000)
FAMPLAN	-7.40215*** (0.0000)	140.626*** (0.0000)
FRN	-5.38631*** (0.0000)	147.984*** (0.0000)
HDI	-3.79876*** (0.0001)	62.8299 (0.8195)

Note: *** indicates significant at 0.01; ** indicates significant at 0.05;
* indicates significant at 0.1.

Where ABOR is Abortion; FERT is Fertility; DHC is Difference Human Capital; DLGDP is Difference Log Gross Domestic Product; LOGCP is Log Contraceptive prevalence; FAMPLAN is Family Planning; FRN is Freedom of Religion; HDI is Human Development Index

Based on Table 4.1, all dependent and independent variables as well as the controlled variables; freedom of religion and human development index were tested with intercept. From the results, we observed that majority of the variables are being rejected at 0.01% significance level. This means that majority of the variables are stationary as the null hypothesis indicating unit root is being rejected. Since all of the variables are tested in level form and majority came out to be stationary, we will not proceed to first difference testing.

4.1 Basic Model

In constructing our basic model, we used Pooled OLS, FEM and REM. We have three dependent variables, they are, abortion, fertility and HIV as well as four independent variables which is human capital, gross domestic product, family planning and contraceptive prevalence. The results for abortion are shown in the table below.

As observed from Table 4.2, most of the variables are found to be significant at 1%. By looking on the journal reviews, gross domestic product and contraceptive prevalence appears to be consistent with the expected sign where both are negatively related to abortion. Negative relationship here implies that with an increase in gross domestic product or contraceptive prevalence, abortion rates will decrease. However, the results for family planning came out impaired with our expectation where a negative relationship is expected but results came out as a positive relationship and it is significant. This might be due to the unmet need for contraception as people are fear of using it from the perspective of its side effects. Some poor quality contraception fails family planning or due to the reason of religious opposition for using contraception. Apart from that, results for human capital are not consistent with the expected sign but we observe that it is not significant.

Next, we have the basic model for fertility. Fertility acts as our dependent variable and there are four independent variables regressed on it. They are human capital, gross domestic product, family planning and contraceptive prevalence. The results for fertility are shown in the table below.

Table 4.2: Basic Model for Abortion

	POLS	FEM	REM
DHC	42.2255*** (10.9086)	0.0431 (3.1079)	0.1940 (3.0966)
DLGDP	-7.8941* (4.0888)	-3.6967*** (0.8926)	-3.7146*** (0.8918)
FAMPLAN	0.1528** (0.0720)	0.2544*** (0.0790)	0.2482*** (0.0764)
LCP	-0.7859 (2.4547)	-9.3854*** (2.6743)	-9.0522*** (2.5856)
Adjusted R-squared	0.11790	0.9606	0.0652
LR test		1076.3938***	
LM test	2274.325***		
Hausman Test			5.8893

Note: * indicates significant at 0.10; ** indicates significant at 0.05;
*** indicates significant at 0.01.

Where ABOR is Abortion; FERT is Fertility; DHC is Difference Human Capital; DLGDP is Difference Log Gross Domestic Product; LOGCP is Log Contraceptive prevalence; FAMPLAN is Family Planning; FRN is Freedom of Religion; HDI is Human Development Index

Based on table 4.3, majority of the variables are significant at 1% significant level. Referring to the journal reviews, human capital is expected to be negatively related to fertility. However, looking at our results, human capital appears to be not significant for both positive and negative relationship. This means that fertility does not merely take account on education but on other factors as well like health and body condition. Family planning appears to be inconsistent with the expected sign as well. A negative relationship is expected between family planning and fertility but

the results turns out to be significant at positive relationship. This is because family planning is not just including the contraception to prevent pregnancy but as well as natural family planning.

There is a method where no contraception is being used by educates people to have sexual intercourse at a specific time of the month. Therefore, this method has a higher chances of getting pregnant compared to contraception which induce family planning to be positively related to fertility. Besides that, we observe that gross domestic product and contraceptive prevalence appears to be consistent with the expected sign where they are negatively related to fertility. This means that with an increase in gross domestic product and contraceptive prevalence, fertility rates will decrease.

Table 4.3: Basic Model for Fertility

	POLS	FEM	REM
DHC	3.6564 (2.3701)	-0.1612 (0.9042)	-0.0762 (0.4166)
DLGDP	-5.0205*** (1.1192)	-1.0760*** (0.3380)	-1.1152*** (0.3378)
FAMPLAN	0.1997*** (0.0133)	-0.0046 (0.0150)	0.0143 (0.0144)
LCP	-8.7455*** (0.4005)	-2.9247*** (0.4348)	-3.4584*** (0.4166)
Adjusted R-squared	0.5491	0.9627	0.6068
LR test		1603.6235***	
LM test	3806.455***		
Hausman Test			30.2657***

Note: * indicates significant at 0.10, ** indicates significant at 0.05, *** indicates significant at 0.01.

Where ABOR is Abortion; FERT is Fertility; DHC is Difference Human Capital; DLGDP is Difference Log Gross Domestic Product; LOGCP is Log Contraceptive prevalence; FAMPLAN is Family Planning; FRN is Freedom of Religion; HDI is Human Development Index

Lastly, we have the basic model for HIV. We will set HIV as our dependent variable and there are three independent variables to be regressed on it. The independent variables are human capital, gross domestic product and contraceptive prevalence. The results for HIV are shown in the table 4.4.

Table 4.4 Basic Model for HIV

	POLS	FEM	REM
DHC	-9.6722*** (2.7892)	-1.6817 (1.1020)	-1.7625 (1.1001)
DLGDP	-3.7709** (1.6989)	-1.3502** (0.5818)	-1.3635** (0.5815)
LCP	0.3643** (0.1652)	0.5919*** (0.1015)	0.5853*** (0.1007)
Adjusted R-squared	0.0490	0.9042	0.1014
LR test		760.1426***	
LM test	1976.109***		
Hausman Test			2.3603

Note: * indicates significant at 0.10; ** indicates significant at 0.05;

*** indicates significant at 0.01.

Where ABOR is Abortion; FERT is Fertility; DHC is Difference Human Capital; DLGDP is Difference Log Gross Domestic Product; LOGCP is Log Contraceptive prevalence; FAMPLAN is Family Planning; FRN is Freedom of Religion; HDI is Human Development Index

Based on table 4.4, we observe that most of the variables are significant at 1% significant level. Human capital appears to be consistent with the expected signs from the review of journals where it is claimed to be negatively related to HIV. However, there is also insignificance for human capital. This might be caused by a lack of credibility for the data to prove the intensity of relationship as we observe a difference between the coefficients for human capital. Gross domestic product is expected to be negatively related to HIV and our results appear to be consistent with the expected sign. Apart from that, contraceptive prevalence is expected to be negatively related to HIV. Conversely, as observed from our results, we found that it is positively related to HIV at 1% significance level. When it comes to

contraceptives, people might think that it only consists of condom usage and it can effectively prevent from the infection of HIV. However, contraceptives include other methods like birth control pills, hormone methods and et cetera. This might be one of the reasons why contraceptive prevalence appears to be positively related to HIV because these methods only used to prevent from pregnancy but do not protect against HIV.

4.2 Preferred Model

Likelihood Ratio, Lagrange Multiplier and Hausman testing were conducted to give us the preferred model for Abortion, Fertility and HIV. Likelihood Ratio test determines the preferred model between Pooled OLS and FEM whereas Lagrange Multiplier test gives us the preferred model between Pooled OLS and REM. If the null hypothesis for Likelihood Ratio and Lagrange Multiplier rejected, it shows that Pooled OLS is not the preferred model and we will proceed to Hausman test to determine the preferred model between FEM and REM.

As observed from table 4.2, the Chi-square test statistic for Likelihood Ratio test is 1076.3938 indicating its significance at 1% with a probability of 0.0000. This means the null hypothesis is being rejected and Pooled OLS is not a preferred model for Abortion. For further proving that Pooled OLS is not a preferred model, we conducted Lagrange Multiplier test. It gives us Breusch-Pagan test statistic which is 2274.325 statistically significant at 1% significance level with probability of 0.0000. Both test sums up that the preferred model might be either FEM or REM. Therefore, we proceed to Hausman test. It gives us a Chi-square statistics of 5.8893 which is not significant with a probability of 0.2076. From the test, we can know that the null hypothesis, REM, is not being rejected. Hence, we conclude that REM is the preferred model for Abortion.

From table 4.3, it shows that the test statistic for Likelihood Ratio test is 1603.6235 significant at 1% significance level with a probability of 0.0000.

This indicates that POLS is not a preferred model for Fertility as the null hypothesis is being rejected. Besides that, looking at the Lagrange Multiplier test, it gives us a test statistic of 3806.455 that is statistically significant at 1% significance level with probability, 0.0000. Observing from the results, we can know that Pooled OLS is definitely not a preferred model for Fertility. So we proceed to Hausman test to determine the preferred model between FEM and REM. The result gives us a test statistic of 30.2657 significant at 1% significance level. From this, we can know that the null hypothesis is being rejected and therefore, we can conclude that FEM is the preferred model for Fertility.

Based on table 4.4, the Likelihood Ratio test statistic is 760.1426, statistically significant at 1% significance level with probability of 0.0000. Apart from that, the Lagrange Multiplier test statistic also gives us a result of 1976.109 significant at 1% significance level. Both the result indicates that Pooled OLS is not the preferred model for HIV where the null hypothesis is being rejected. After knowing the results of Likelihood Ratio and Lagrange Multiplier test, we proceed to Hausman test. The test statistic for the test is 2.3603 where it is not significant and we do not reject the null hypothesis. Hence, we can conclude that REM is the preferred model for HIV.

4.3 Does Legalization Of Prostitution Bring Effect To Abortion Rate, Fertility Rate and HIV Prevalence?

Table 4.5 shows the test results for abortion rate before and after the legalization of prostitution. Based on the table, the coefficient of human capital has largely reduced from 17.6445 to -9.9665 after the legalization. Human capital has reduced the abortion rate as legalization occurs. Most of the prostitute will be educated on the acknowledgement of HIV and are encouraged for using contraceptive, thus, abortion rate will decrease in this case after legalization. Same goes to the contraceptive prevalence, the abortion rate decrease after prostitution has been legalized. The reason are

same as human capital, this is because prostitute are educated for using contraceptive during sex activities. The more modish the usage of contraceptive prevalence, the lower the abortion rate will be in a nation. This might be the reason why family planning will reduce abortion rate when legalization happened.

The coefficient of family planning has reduced from 0.2318 to -0.0223 and positive significant at 5% significant level after the legalization of prostitution. However in previous chapter, we expect that after legalization of prostitution the abortion rate will increase with the decrease of family planning. By looking from the prostitute perspective, some of the prostitute might not be willing to form a family or having a child because they might care or feel embarrassed on how people look on their job and thus they will use contraceptive to prevent from getting pregnant.

Refer back to table 4.5, the coefficient for gross domestic product and freedom of religion increase after the legalization of prostitution. The result show that a higher gross domestic product and freedom of religion will contribute higher abortion level in a nation however both of the result is insignificant. By referring back to the expected sign in chapter 3, the journal stated that legalization of prostitution will further decrease the abortion with the decrease of gross domestic product and freedom of religion. The result is not strong because it is insignificant.

Based on Table 4.6, family planning has significant and positive relationship to fertility and the relationship will still remain as positive after the legalization of prostitution. We can explain it as when prostitute is legalized, the fertility rate will decrease along with the increase of family planning. This result is different with our expectation where we expected the reduction of family planning will increase the fertility rate. This situation may due to they are not readiness to form a family as they already have formed it and are prepared to get pregnant and to have kids. Besides that, we found that the legalization of prostitution has reduce the fertility rate with the more contraceptive is used.

The result for Human Capital shows that the legalization happened will reduce the fertility rate with the decrease of human capital, but this result is not strong to prove because it is insignificant. Same happen to Gross Domestic Product, the result does not show a significant relationship towards fertility in the test result. The test result shows that Gross Domestic Product are negatively related and will further reduce to the fertility rate after the legalization of prostitution.

Next, the fertility rate will reduce after legalization happened with the less freedom of religion and this result is same as our expected in Chapter 3. Lastly, higher human development index such as income and health index will increase the fertility rate as expected but the result is insignificant so it can't strongly prove the result.

Table 4.7 are all about discussing the impact of prostitution legalization bring to HIV prevalence through human capital, gross domestic product, contraceptive prevalence, freedom of religion and human development index. The coefficient of human capital has increased from -3.0348 to 2.1512 and we can prove that legalization has brought impact to HIV prevalence through human capital. However, this result is not strong enough to prove that human capital will increase HIV prevalence because the result is insignificant.

After the legalization of prostitution, Freedom of religion and human development index will also bring effect to HIV prevalence. From the result, we can observe that HIV prevalence has increased when there is more freedom of religion. On the hand, the higher the human development index, the lower the HIV prevalence. However, these two variables are insignificant in the result.

Besides, HIV prevalence has been found increased through gross domestic product after legalization. The coefficient is significant at 1% significant level. The result brings the meaning that when a nation with higher gross domestic product, HIV prevalence level in that nation will also be higher. After legalization of prostitution, prostitutes are forced to pay tax to government and it will stimulate to nation gross domestic product. In order

to save their cost, some prostitutes will not spend money on doing contraceptive prevalence despite of the government rules and regulation thus HIV prevalence increase in this case. The expected sign for this result is not same as our expectation in previous chapter as we expected that there is negative relationship between gross domestic product and HIV prevalence after the legalization.

The usage of contraceptive prevalence has reduced the HIV prevalence from 0.0386 to -0.2181 and significant at 5% significant level after prostitution is legalized. When prostitution are legalized, the government will introduce relevant rules and regulation in order to protect prostitutes, prostitutes are forced to use contraceptive prevalence, thus HIV prevalence decrease.

4.4 Does Drugs Legalization Contribute Effect To Fertility Rate and HIV Prevalence?

Referring to table 4.8, we found that after drug has been legalized, the fertility rate will decrease as the coefficient drop from 0.0039 to -0.0547 through more family planning has made. However in previous chapter discussion, we expected the legalization will boost the fertility rate with less family planning made. A well family planning are not only depends on the personal factor, several factors are also being considered, for example political stability and economic conditions. Fertility rate will decrease as people will feel uncertainty about the drug legalization, they didn't know what impacts will it bring to society and economy thus in this case, fertility rate will decrease when there is more family planning after the legalization.

Next, the coefficient for human development index has decreased to -7.3076 after legalization are put into practice. This implies that, with the higher level of human development index, there will be a decrease of the fertility rate. It can be explained by the legalization of drug are contributing tax income to the gross domestic product, economic situation are good, people enjoy the life expectancy for current situation, and they not willing to

have a child to increase their burden. In this case, fertility rate will decrease as human development index increase after the legalization.

In an opposite side, fertility rate is found to be increase after drug has been legalized with the low contraceptive usage. The coefficient increased from -2.2638 to -1.7225 and is significant at 1% significant level. The legalization of drug for medical use has built people confidential as some of the drug can be used to cure disease and will also stimulate a nation fertility level. However, we expected that fertility rate will decrease further after the legalization happened with more contraceptive people will use.

Referring to table 4.9, human capital is found to reduce the HIV prevalence after the legalization of drug. The coefficient has decrease from -0.4144 to -84.2739 and significant at 1% significant level. Normally we will think that more educated person will be more knowledgeable on HIV prevalence, thus it is possible to have a decrease of HIV prevalence when drug is being legalized because government light up the relationship between drug and HIV prevalence to public.

Although human capital has increased HIV prevalence, but the coefficient for gross domestic product after legalization has decreased compared to before-legalization and it has been found that a negative relationship exist between gross domestic product and HIV prevalence. A nation's gross domestic product increase when drug is legalized as it is another form of income for government, people will consume less of drugs as it will be tax and it is only available in pharmacy, clinic or hospital, subsequently, HIV prevalence reduce. Same goes to the contraceptive usage, after drug are being legalized, HIV prevalence decreased. The coefficient is significant at 5% significant level, and we found that the more usage for contraceptive prevalence, the lower the HIV prevalence.

HIV prevalence is also found to be reduced when drug is legalized by looking on the human development index. Based on the result, we can conclude that when the human capital index is higher, HIV prevalence are tend to be lower after the legalization. When government take full responsible to its citizen in the sense of organizing some community activity

or services for its citizen to pull them out from drugs addiction, people will cut down their consumption of drugs as they have other alternative ways to release their stress, thus HIV is prevented in this case.

4.5 Conclusion

We have proceeded to the unit root test as our pre-test to make sure that none of our variables are in non-stationary form. Next, we conducted LR, LM and Hausman test to choose the preferred model for our dependent variables which is Abortion rate, fertility rate and HIV prevalence. Lastly, we have form three type of model to investigate the relationship between dependent variables and independent variables. An additional of two control variable is being added into the model in order to find out the relationship between independent and dependent variables. We also added in some interactive term as our dummy variable to study the impact of the legalization of drugs and prostitution towards three of the dependent variables we will examine.

Table 4.5 Results for Abortion Rate after Prostitution is Legalized through Social Variable

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
C	20.6071*** (5.0959)	21.0116*** (5.1754)	21.5112*** (5.1253)	19.6536 *** (5.1111)	4.0258*** (5.2551)	20.6384*** (5.1230)	20.4893*** (5.0451)	21.2063*** (5.1560)	21.3181*** (5.2312)
DHC	0.1940 (3.0966)	0.2432 (3.1036)	-1.0557 (3.1135)	7.6780* (4.2417)	1.5745 (4.2860)	-1.2756 (3.1000)	-1.3523 (3.0479)	-0.9515 (3.1183)	-1.0458 (3.1009)
DLGDP	-3.7146*** (0.8918)	-3.7545*** (0.8976)	-3.2126*** (0.9130)	-2.9565*** (0.9081)	-3.2494*** (0.9087)	-3.2291*** (0.9085)	-3.1823*** (0.8930)	-3.2359*** (0.9138)	-3.2314*** (0.9135)
FAMPLAN	0.2482*** (0.0076)	0.2526*** (0.0771)	0.2441*** (0.0764)	0.2237*** (0.0759)	3.0375*** (0.0784)	0.2318*** (0.0763)	0.2187*** (0.0757)	0.2405*** (0.0767)	0.2407*** (0.0780)
LCP	-9.0522*** (2.5856)	-9.2222*** (2.6161)	-8.8232*** (2.5933)	-8.0193*** (2.5811)	0.9353 (0.0946)	-8.1454*** (2.6019)	-7.8298*** (2.5766)	-8.6937*** (2.6049)	-8.7159*** (2.6475)
FRN		-0.0213 (0.0477)	-0.0358 (0.0476)	-0.0368 (0.0471)	1.9707** (1.5295)	-0.0348 (0.0473)	-0.0346 (0.0465)	-0.0707 (0.0681)	-0.0359 (0.0474)
HDI			-1.8735*** (0.7206)	-1.7520* (0.7147)	-3.9094*** (1.0071)	-1.8099** (0.7179)	-1.8161** (0.7057)	-1.8297** (0.7240)	-1.7358* (0.9504)
DHC*LEGALPROS				-17.6445*** (5.8862)					
DLGDP*LEGALPROS					0.3791 (2.4918)				
FAMPLAN*LEGALPROS						-0.0223** (0.0098)			
LCP*LEGALPROS							-0.4692** (0.1935)		
FRN*LEGALPROS								0.0665 (0.0929)	
HDI*LEGALPROS									-0.2027 (0.8874)
R-squared	0.0763	0.0770	0.0952	0.1189	0.0954	0.1093	0.1110	0.0969	0.0958
Adjusted R-squared	0.0652	0.0632	0.0789	0.1003	0.0764	0.0905	0.0922	0.0778	0.0767
F-statistic	6.9145	5.5765	5.8389	6.3999	5.0046	5.8183	5.9200	5.0876	5.0227
Prob(F-statistic)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Durbin Watson stat	0.3597	0.364	0.3620	0.3789	0.3630	0.3683	0.3683	0.3647	0.3629

Note: * indicates significant at 0.10, ** indicates significant at 0.05, *** indicates significant at 0.01; Where DHC is Differences Human Capital; DLGDP is Differences Log Gross Domestic Product; FAMPLAN is Family Planning; LCP is Log Contraceptive Prevalence; FRN is Freedom of Religion; HDI is Human capital index

Table 4.6 Test Results for Variable With and Without Interactive Term Regressed Against Fertility

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
C	14.9942*** (0.7136)	14.9872*** (0.7139)	14.5171*** (0.6315)	14.4627*** (0.6319)	14.4611*** (0.6480)	12.8528*** (0.6288)	12.3136*** (0.6592)	14.4905*** (0.6307)	14.6889*** (0.6813)
DHC	-0.1612 (0.9042)	-0.1714 (0.9045)	-1.0690 (0.8019)	-3.2297* (1.6528)	-1.0476 (0.8043)	0.2410 (0.7738)	0.1213 (0.7757)	-1.1707 (0.8027)	-1.1527 (0.8118)
DLGDP	-1.0760*** (0.3380)	-1.0830*** (0.3382)	-0.1851 (0.3066)	-0.2117 (0.3069)	-0.0877 (0.3952)	-0.394882 (0.290962)	-0.2533 (0.2914)	-0.1485 (0.3069)	-0.1441 (0.3128)
FAMPLAN	-0.0046 (0.0150)	-0.0051 (0.0150)	-0.0090 (0.0133)	-0.0119 (0.0134)	-0.0100 (0.0136)	0.0264** (0.0132)	-0.0323** (0.0129)	-0.0089 (0.0133)	-0.0069 (0.0136)
LCP	-2.9246*** (0.4348)	-2.9075*** (0.4353)	-2.1008*** (0.3896)	-2.0272*** (0.3922)	-2.0665*** (0.3996)	-1.4943*** (0.9752)	0.3381 (0.4781)	-2.0877*** (0.3900)	-2.1801*** (0.4071)
FRN		-0.0149 (0.0179)	-0.0369** (0.01587)	-0.0354** (0.0158)	-0.0367** (0.0159)	-0.0278* (0.0150)	-0.0272* (0.0151)	0.0049 (0.0290)	-0.0366** (0.0159)
HDI			-3.5367*** (0.2741)	-3.5652*** (0.2744)	-3.5400*** (0.2744)	-3.1642*** (0.2628)	-3.0834*** (0.6592)	-3.5666*** (0.2743)	-3.8211*** (0.5032)
DHC*LEGALPROS				2.8432 (1.9023)					
DLGDP*LEGALPROS					-0.2450 (0.6259)				
FAMPLAN*LEGALPROS						-0.0691*** (0.0082)			
LCP*LEGALPROS							-2.1429*** (0.2661)		
FRN*LEGALPROS								-0.0599* (0.0346)	
HDI*LEGALPROS									0.3976 (0.5900)
R-squared	0.9650	0.9650	0.9728	0.9729	0.9728	0.9757	0.9755	0.9729	0.9728
Adjusted R-squared	0.9626	0.9626	0.970829	0.9709	0.9708	0.9739	0.9737	0.9709	0.9708
F-statistic	405.3347	395.2605	498.6267	488.1081	486.3305	546.7404	541.6030	488.7574	486.5876
Prob(F-statistic)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Durbin Watson stat	0.1412	0.1431	0.154553	0.1544	0.154	0.1566	0.1518	0.1608	0.155

Note: * indicates significant at 0.10, ** indicates significant at 0.05%, *** indicates significant at 0.01%; Where DHC is Differences Human Capital; DLGDP is Differences Log Gross Domestic Product; FAMPLAN is Family Planning; LCP is Log Contraceptive Prevalence; FRN is Freedom of Religion; HDI is Human capital index

Table 4.7 Test Results for Variable With and Without Interactive Term Regressed Against HIV

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
C	-1.8225*** (0.4330)	-1.8257*** (0.4342)	-1.2867*** (0.4398)	-1.2658*** (0.4402)	-0.8781 (0.7045)	-1.3540*** (0.4224)	-1.3006*** (0.4324)	-1.3592*** (0.4392)
DHC	-1.7625 (1.1000)	-1.7005 (1.1012)	-1.0842 (1.0721)	-3.0348 (3.4008)	-1.4487 (1.0669)	-0.9945 (1.0368)	-1.0083 (1.0721)	-0.9970 (1.0763)
DLGDP	-1.3635** (0.5815)	-1.3716** (0.5814)	-1.9020*** (0.5741)	-1.9134*** (0.5750)	-10.3549*** (2.5278)	0.3016* (0.1710)	-1.9173*** (0.5723)	-1.8767*** (0.5750)
LCP	0.5853*** (0.1007)	0.5761*** (2.6161)	0.0717 (0.1504)	0.0710 (0.1504)	-0.1804 (0.4496)	0.0386* (0.0206)	0.0947 (0.1489)	0.1050 (0.1509)
FRN		-1.8257*** (0.4342)	0.0388* (0.0213)	-0.0403* (0.0215)	0.03433 (0.0210)	2.1343*** (0.4907)	-0.0306 (0.0611)	0.0398* (0.0213)
HDI			2.2539*** (0.5100)	-1.7520* (0.7147)	2.4632*** (0.5060)	2.1343*** (0.4907)	2.1312*** (0.5034)	2.7739*** (0.6451)
DHC*LegalPros				2.1512 (3.5777)				
DLGDP*LegalPros					8.8960*** (2.5798)			
LCP*LegalPros						-0.2181** (0.0897)		
FRN*LegalPros							0.0780 (0.0643)	
HDI*LegalPros								-0.7050 (0.4945)
R-squared	0.1098	0.1136	0.1655	0.1654	0.1976	0.1776	0.1649	0.1682
Adjusted R-squared	0.1014	0.1024	0.1524	0.1496	0.1798	0.1620	0.1490	0.1524
F-statistic	13.1168	10.1857	12.5771	10.4389	11.0842	11.3706	10.3969	10.6530
Prob(F-statistic)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Durbin Watson stat	0.1106	0.1141	0.148	0.1494	0.1956	0.1455	0.1514	0.1466

Notes: * indicates significant at 10%, ** indicates significant at 5%, *** indicates significant at 1%; Where DHC is Differences Human Capital; DLGDP is Differences Log Gross Domestic Product; FAMPLAN is Family Planning; LCP is Log Contraceptive Prevalence; FRN is Freedom of Religion; HDI is Human capital index.

Table 4.8 The Impact on Fertility Rate before and after Legalizing Drug

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
C	14.9942*** (0.7136)	14.9872*** (0.7139)	14.5172*** (0.6315)	14.5143*** (0.6320)	14.5278*** (0.6321)	14.5627*** (0.6148)	14.6727*** (0.6154)	14.5076*** (0.6104)
DHC	-0.1612 (0.9042)	-0.1714 (0.9045)	-1.0690 (0.8019)	-0.9463 (0.8370)	-1.0596 (0.8024)	-0.6690 (0.7837)	-0.6889 (0.7835)	-0.9203 (0.7754)
DLGDP	-1.0760*** (0.3380)	-1.0830*** (0.3382)	-0.1851 (0.3067)	-0.1825 (0.3069)	-0.1319 (0.3178)	-0.1650 (0.2986)	-0.1790 (0.2986)	-0.2640 (0.2967)
Famplan	-0.0046 (0.0150)	-0.0051 (0.0150)	-0.0089 (0.0133)	-0.0085* (0.0133)	-0.0085 (0.0133)	0.0039 (0.0131)	0.0029 (0.0131)	-0.0038 (0.0129)
LCP	-2.9247*** (0.4348)	-2.9075*** (0.4353)	-2.1008*** (0.3900)	-2.1080* (0.3901)	-2.1088*** (0.3899)	-2.2902*** (0.3806)	-2.2638*** (0.3803)	-2.1723*** (0.3767)
FRN		-0.0149 (0.0179)	-0.0367** (0.0159)	-0.0368* (0.0159)	-0.0369** (0.0159)	-0.0373** (0.0155)	-0.0373** (0.0155)	-0.0359** (0.0153)
HDI			-3.5367*** (0.2741)	-3.5390*** (0.2743)	-3.5497* (0.2749)	-3.5926*** (0.2670)	-3.5798*** (0.2669)	-3.3243*** (0.2669)
DHC*LegalDrug				-1.5315 (2.9696)				
DLGDP*LegalDrug					-0.7853 (1.2192)			
Famplan*LegalDrug						-0.0547*** (0.0095)		
LCP*LegalDrug							-1.7225*** (0.2986)	
HDI*LegalDrug								-7.3076*** (1.1228)
R-squared	0.965	0.965	0.9728	0.9728	0.9728	0.9742	0.9742	0.9746
Adjusted R-squared	0.9626	0.9626	0.9708	0.9708	0.9708	0.9724	0.9724	0.9728
F-statistic	405.3347	395.2605	498.62670	486.4268	486.5540	514.6915	514.6239	522.3876
Prob(F-statistic)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Durbin Watson stat	0.1412	0.1431	0.1546	0.1544	0.1554	0.1579	0.1583	0.1614

Notes: * indicates significant at 10%, ** indicates significant at 5%, *** indicates significant at 1%; DHC is Differences Human Capital; DLGDP is Differences Log Gross Domestic Product; FAMPLAN is Family Planning; LCP is Log Contraceptive Prevalence; FRN is Freedom of Religion; HDI is Human capital index

Table 4.9 Test Results for Variable With and Without Interactive Term Regressed Against HIV

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
C	-1.8225*** (0.4330)	-1.8257*** (0.4342)	-1.2867*** (0.4397)	-2.0703*** (0.4143)	-1.3540*** (0.4359)	-1.3652*** (0.4073)	-1.3291*** (0.4416)	-1.4840*** (0.4064)
DHC	-1.7625 (1.1001)	-1.7005 (1.1012)	-1.0842 (1.0721)	-0.4144 (0.9691)	-0.9731 (1.0581)	-1.0124 (0.9770)	-1.0419 (1.0725)	-0.9314 (0.9694)
DLGDP	-1.3635** (0.5815)	-1.3716** (0.5814)	-1.9020*** (0.5741)	-1.6877*** (0.5178)	-1.5495*** (0.5787)	-1.8872*** (0.5231)	-1.9163*** (0.5742)	-1.8563*** (0.5189)
LCP	0.5853*** (0.1007)	0.57613*** (0.1011)	0.0717 (0.1504)	0.3041** (0.1396)	0.0932 (0.1488)	0.1146 (0.1395)	0.0579 (0.1507)	0.1586 (0.1390)
FRN		0.0242 (0.0218)	0.0388* (0.0213)	0.0345* (0.0192)	0.0380* (0.0210)	0.0381* (0.0194)	0.0388* (0.0213)	0.0374* (0.0193)
HDI			2.2539*** (0.4398)	2.0718*** (0.4638)	2.2184*** (0.5045)	2.2028*** (0.4701)	2.3291*** (0.5125)	2.1525*** (0.4663)
DHC*LEGALDRUG				-84.2739*** (10.8971)				
DLGDP*LEGALDRUG					-7.9201*** (2.6597)			
LCP*LEGALDRUG						-0.3068** (0.1326)		
FRN*LEGALDRUG							0.4557 (0.3010)	
HDI*LEGALDRUG								-3.2560*** (0.8702)
R-squared	0.1098	0.1136	0.1655	0.2973	0.1892	0.1802	0.1721	0.1989
Adjusted R-squared	0.1014	0.1024	0.1524	0.284	0.1738	0.1647	0.1564	0.1837
F-statistic	13.1168	10.1857	12.5771	22.2793	12.2881	11.5787	10.9483	13.0789
Prob(F-statistic)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Durbin Watson stat	0.1106	0.1141	0.148	0.1726	0.2148	0.1490	0.1500	0.1489

Notes: * indicates significant at 10%, ** indicates significant at 5%, *** indicates significant at 1%; DHC is Differences Human Capital; DLGDP is Differences Log Gross Domestic Product; FAMPLAN is Family Planning; LCP is Log Contraceptive Prevalence; FRN is Freedom of Religion; HDI is Human capital index

CHAPTER 5: CONCLUSION

5.0 Introduction

In this chapter, we analyse the results generated and provide a brief summary about it. there will be discussion done on major findings before covering limitations and recommendations on what can we improve in this research. Hence, we conclude our research.

5.1 Discussion on Major Findings

The main objective of this research paper is to examine the relationship between the social impacts (abortion rate, fertility rate, HIV prevalence) with human capital, gross domestic product, family planning and also contraceptive prevalence. We will also determine how social impacts (abortion rate, fertility rate, HIV prevalence) will change after legalizing prostitution and drugs. Based on the empirical results, there are some conclusions made to meet the objectives.

Summing up the relationships

We found that a high gross domestic product and contraceptive prevalence will reduce the abortion rate in a country. A higher gross domestic product means that the nation is having good economic condition and people will have a stable job and financial status. People will choose to have children when the economic

condition is good. Contraceptive prevalence is used to avoid pregnancy, therefore, the more usage of contraceptive the lesser the abortion rate.

High abortion comes with high family planning and hence, we observe a positive relationship between them. Even when people plan not to have children, they would not consider using contraceptives as well due to its side-effects. However, people who use contraceptives will have the possibilities of getting pregnant as a result of defect contraceptives. In this case, abortion will actually increase instead of decreasing. Lastly, human capital is found to be positively related to abortion rate but it is insignificant.

Referring to the empirical results, human capital on fertility rate is found to be not significant for both positive and negative relationship. Gross domestic product and contraceptive prevalence appear to be negatively related to fertility rate. This means that when there is a good economic, the fertility rate will tend to be lower. People will only put their career as first priority instead of family. As for contraceptive prevalence, higher usage of contraceptives will lead to lower fertility rate where they are negatively related in this case. Apart from that, a positive relationship is found between family planning and fertility rate. This is because not everyone uses contraceptives when they do family planning. There is also an alternative method which is natural family planning. However, natural family planning will not be as effective as contraceptives and hence, this will contribute to a high fertility rate.

The negative relationship between gross domestic product and HIV prevalence occurs when the economic condition in a nation is good, government may spend more money on health expenditure and there will be a reduction on HIV prevalence in this case. Contraceptive prevalence is found to be positively related to HIV prevalence. Contraceptive prevalence not only refers to the usage of condom but also birth control pills. These pills can help to avoid from

pregnancy but it does not protect women from HIV. Therefore, increases possibilities of HIV infection and HIV prevalence will increase in this case.

Legalization of prostitution has decreased abortion rate, fertility rate and increase HIV prevalence.

Generally we found that abortion rate has reduced after legalization of prostitution. Most of the prostitute will be educated for the knowledge of HIV and will encouraged for using contraceptive, thus, abortion rate in this case will decrease after legalization. Contraceptive usage also found to be reduced abortion rate after legalization happened as prostitute will be educated and forced to use contraceptive when the rules and regulation are there. Besides, prostitute may feel shamed and worried about their children will have diseases even though their occupations has already legalized, so they might not planning to have children. In this case, abortion rate decrease when family planning increase.

Family planning has significant and negative relationship to fertility and after the legalization of prostitution the relationship is positive relationship. When people plan not to have children in current situation and plan more on future, they might not plan to have children now, so fertility rate decrease. The more contraceptive usage, the lower the fertility rate no matter prostitution is legalized or not. When comes to the freedom of religion, our result shows that the fertility rate has decreased when the religion is more freedom, people can choose want to have a children or not.

HIV prevalence has increased when there is more freedom of religion. On the hand, the higher the human development index, the lower the HIV prevalence. However, the result is insignificant for these two variables. HIV prevalence has found been increased

through gross domestic product after legalization, which means when a nation with higher gross domestic product, its HIV prevalence level in that nation also will be higher. After legalization of prostitution, prostitutes are forced to pay tax to government and it will stimulate to nation gross domestic product. In order to save their cost, some prostitutes will not spend money on doing contraceptive prevalence although the government rules and regulation are there, but still have some group of prostitution will not using it, thus HIV prevalence increase in this case.

Legalization of drug has decreased fertility rate and reduce HIV prevalence.

We found that family planning has reduced fertility rate after drug is being legalized. A well family planning not only depends on the personal factors, but also other factors, for example political stability and economic conditions. Fertility rates will decrease as people feels uncertain about drugs legalization. They did not know what will be the impacts to society and economy. Thus in this case, fertility rates decrease when there is more family planning after the legalization. Next, a higher level of human development index will induce low fertility rates. We can explain it by legalization of drugs. It will contribute tax income to gross domestic product, economic situation will be good, people enjoy a better life for current situation, and they are not willing to have a child as it will increase their burden. In this case, fertility rates will decrease as human development index increases after the legalization. Human capital and gross domestic product also found to be reducing the fertility rates after legalization, but there are insignificant.

Human capital is found to be decreasing with the HIV prevalence after legalization of drugs. More educated people will

have more knowledge on HIV prevalence, so it is possible for HIV prevalence to decrease when drug is legalized because government will take action to make people aware on how drugs and HIV prevalence are related. Gross domestic product and human development index will also decrease the HIV prevalence when drug is legalized.

5.2 Policy Implication

In general, we found that legalization of prostitution and drugs bring positive effect to social impacts. Therefore, we would like to suggest the government to implement the legalization of prostitution through enforcement of law and regulation to control the sex industry. Based on our test results, we found that legalizing prostitution further reduce the social impacts. The government are suggested to take control on these occupations such as applying for licence of business, impose taxes and regular inspections (Weitzer, 2012). Although legalizing prostitution reduces punishment for prostitution, government should set a law that can protect sex workers from violence and sex abuse.

Besides, policy maker should conduct health awareness campaign and certain activities among people after legalized the prostitution and drugs. They should conduct health awareness on drug used so that people are aware on the negative impact of using the drugs. It could improve health perception among people so that people will avoid over consume on drug used to maintain healthy lifestyle. Other than that, regulations that require usage of contraceptives should be implemented to increase the awareness on health issues to avoid the increase of HIV infections and abortions. Policy makers are suggested to strengthen the youth sex education so that youth have more knowledge on contraception usage such as

using condoms when having sex. It is crucial for youth to have sexual education so that social impacts like abortion and HIV can be reduced.

Furthermore, legalization of drugs brought significant effect to the social impacts. Thus, we suggest policy makers to implement drug policy that are suitable to the country as it can reduce harm to the society and at the same time increase the economy of the country. Government are advised to allocate funds and increase the spending on education and rehabilitation to reduce the social impacts caused such as HIV infections. Policy makers should also restrict the amount of drug used in the country. This regulation is able to help the government to have a better control over drug market and reduces the size illegal market. The selling of drugs should have age limits in order to prevent kids from buying drugs and get addicted to it.

5.3 Limitations of the Study

After conducting the test, we found that there are some limitations exist in our result. These limitations will affect the significances of the variables and the outcomes. Therefore, the limitation should be concerned and minimizes it as much as possible to get a better outcome. Below are the discussions of limitations in our studies.

5.3.1 Omitted variables

Our studies are focused on the impact after legalizing drugs and prostitution. The social impacts found in our study are abortion, fertility and HIV. We picked four independent variables and two control variables to conduct our study. However, there are some other variables that will directly and indirectly affect the social impacts.

Therefore, the outcome shown in our test results only focus on certain issues. There are still many more variables that will affect the impacts after legalizing drugs and prostitution. Hence, the outcomes shown only focus on the certain variables will limit the scope of study. The outcome of the result does not perfectly reflect on the society after legalization.

5.3.2 Different proxy for legalization

Since legalization of drugs and prostitution are qualitative variables, we use dummy to represent it. Dummy variable only consist of two indicators which is 1 and 0. There are few categories of legalization such as fully legalize, decriminalized and not legalized. The number 1 represents the countries that legalize the drugs and prostitution and otherwise noted as 0. From the test, we only can determine whether drugs and prostitution is legalized or not. In our study, if a country has legalized drugs and prostitution, we noted it as 1. Therefore, the data we collect is either legalized or not legalized. Besides, the control variable such as freedom of religion is lack of sensitivity in terms of scale which consists of only scale of 1 to 10. It is hard to determine how much freedom it is as when the number of scale is 10. Therefore, the outcomes will be limited based on just the scale.

5.4 Recommendations for Future Research

5.4.1 Conduct the determinant based on different perspective

In order to overcome the limited scope of social impacts, future researchers can take account on other impacts which has never been used by previous studies to make it more complete and significant. Most of the studies are mainly focusing on abortion, fertility, HIV prevalence, crime rate and human trafficking. Therefore, future researcher can include variables that previous researchers have not included before or less concentrate in the society. Issues may arise over the time, there will be opportunities for the future researchers to investigate on new issues. Hence, it will strengthen the evidence of the variables if future researchers include the variables from different perspective into their research. Considering variables from different perspectives will make our model better.

5.4.2 Improve the sensitivity of scale

Future researcher can improve the scale of collecting data by increasing the accuracy of the measurement. Qualitative variables like legalization of drugs and prostitution that hard to be measured can also increase its scale measurement. In order to make the measurement more specific, future researcher can take account of decriminalized as well by adding dummy variable instead of just legalized and not legalized. Therefore, the level of legalization will more sensitive instead of only two values. It will contribute more information to our study. With this increasing of scale, future researchers can have better measurement and more accurate on the studies.

5.5 Conclusion

This chapter summarizes all the test results and generates a comprehensive discussion based on each of the independent variables. Other than that, this chapter also provides several policy implications for policy makers. The limitations of the study and few recommendations for future researches are also being listed out in this chapter.

As a conclusion, we have made clear about the social impacts of legalization of drugs and prostitution. We also find out how the society reacts when government intends to legalize drugs and prostitution and its impacts towards the society. Through this study, we are able to identify the signs and relationships of legalizing drugs and prostitution with its social impacts. Legalization hereby plays an important role in affecting the social impacts. However, the impact of legalizing drugs and prostitution will differ among countries as there are differences in religion and culture. Hence, we included controlled variables like freedom of religion and human development index to see how these two variables being affected by legalization.

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