

## **Whether UBI makes our society a better place: A case study on crime rate**

### **I. Introduction**

The Universal Basic Income (UBI) has been proposed since decades ago. As a proposal for current redistribution system which is a reform of previous welfare policies. The goal of it is to reduce income gap, promote individual liberty, and alleviate the tensions from issues due to social-economic inequality in the society—especially the issue related to income inequality. Take the United States for example: Consumer Price Index (CPI)—a measurement tool for inflation—is approximately 1.8% in 2019 and almost doubled from that in 2016, indicating a high growth rate of inflation that rising the daily life expense of Americans (Reuters, 2018). In a null shell, the CPI index shows that total wealth of this society is increasing with a highly unbalanced distribution. However, for the household income in 2018, the 90<sup>th</sup> percentile increased by 7.5%, while the 10<sup>th</sup> percentile decreased by 4.5% (NYT, 2018). A more intuitive interpretation is that more and more households are receiving relatively less money while facing an increasingly growing rate of inflation. Meanwhile, the social wealth in total is more concentrated on the side of the rich. Along with the strong unsatisfaction towards the huge income inequality, extremist views including xenophobia and racism towards foreigners and immigrants also take place. Such situation where social inequality is causing angry and exclusive atmosphere is exactly what UBI

proposes for. That is, to reshape the income distribution in a way that the wealth distribution is less concentrated in the relatively richer household, as a sign of improving social justice and equality. In this paper, I'm arguing that implementing UBI can bring positive effect to improve social inequality and benefits. In addition, since UBI has a wide range of impacts, I will particularly take the violent crime rates driven by economic factors, as a more tangible indicator to measure the improvement on society and people's life.

The rest of this paper is structured as follows: In section II, I will generally explain UBI as an instrument of welfare policy, the theoretical justification to have it, the importance of UBI in the perspectives of justice and liberty, and the relationship between crime rates and social inequality as well as the possible impact of UBI on crime rates. In section III, I will argue that UBI has positive effect in reducing the crime rates by lessening the income gap, improving good future expectancy, and strengthening trust in the government & judiciary, with a mathematical tool using linear regression method whose mathematical expectation can be verified by existing studies about UBI. In section IV, I will discuss based on possible criticism and advice for future study. In section V, I will give my general conclusion of this paper.

## **II. Literature Review**

To have a better understanding of what previous scholars think of Universal Basic Income (UBI) and its social-economic effect, it is better to ask several questions: what is UBI, why should we have UBI, and how will it work. The structure of this section also follows the order of questions above.

For the first question “what is UBI”, it can be defined as a kind of welfare payment policy. It can be briefly defined as an unconditionally periodic cash payment at a modest amount, to all members of a political community (Parjis 2002, 4). The key features of UBI can be concluded as “unconditional” and “basic (amount)”. Firstly, the term “unconditional” refers to three categories: (a) no conditions on current income level—there are no means-test as long as the beneficiary is a legitimate citizen or resident who spent considerable time in this community, which manifest the character of universality; (b) no conditions on where the money is spent—the beneficiary has full right to decide what is the best way to spend this income; (c) no conditions on recipient behaviors—there are no requirements on what the beneficiary should do in exchange of the right to receive the basic income, for example, finding a new job within 3 months. Secondly, “basic” means a well-deliberated amount that is sufficient to support an average citizen based on the basic standards of living. Hence, the amount of this basic income is set by the policy makers, considering factors such as the business cycle, variations of CPI and price index. Thirdly, this payment occurs regularly. A common routine is believed to be one month. Last but not the least, implementing UBI is indeed a profound reformation to distribution system, however, it does not necessarily abandon all other welfare policies like veteran pension or social security fund.

For the second question on the reason why people support UBI, it can be viewed as an urge for a new form of government intervention for a more equal distribution system. To begin with, in order to understand why people urge for a new redistribution instrument, we need to look back the term distribution. It common in this world that the state regulates and may also intervene the

market, no matter it is a free market or a monopolized market. Hence, to understand the term “distribution”, it can be defined as “[...] the result of the simultaneous, joint operation of voluntary choices of interacting individuals and authoritative rule-making and enforcement by states.” (Wright 2006, 1). According to Weight, since the current (income) distribution is partially shaped by the presence of government, one of the major objectives of redistribution is to find out what sort of state intervention involving in the pattern of income distribution, which would consequently most benefits people in the social-economic context and best serves the principle of justice. Therefore, Wright and his colleagues provide a “provocative” proposal—universal basic income, which is related to studies of philosopher Thomas Paine. Paine (2019, 1) brought up the Social dividend Theory that the natural resources (on this planet) belongs to the ancestors of all current human beings. Hence, everyone in this world should have the right of benefiting from the Earth. And the way of how people use it is decided by contracts and politics, where poverty is the result of “civilized life” and people can otherwise live in autarky—a life that self-sustainable—in natural conditions. In other words, we are born to have a share of dividend in terms of this society, whose right of this planet can be dated back to our ancestors and their devotion to exploiting the natural resources. Therefore, it is reasonable, in a liberalism view, to distribute a part of social income to every members of their society in a way as same as the function of dividends or stocks.

For the third question on how to testify the effectiveness of UBI on social welfare, it can be solved by finding an index that is related to effect of UBI and qualifiable. Since UBI is a new way of redistribution can impact the society in a large-scale including poverty, resident

happiness, national economy and other aspects, it is easier to estimate if the effect can be classified and reflected by data. To estimate the policy effect, it is ideal to be able to qualify this effect and prove its causal relationship with the UBI policy. From current study, there is a plausible index—crimes rates such as robbery or illegal hunting that is significantly related to income inequality. These crime rates are effective indicators because firstly they are countable data from reported cases in local police stations, and secondly, they are strongly related to issues of poverty. In a World Bank study conducted by Fajnzylber et al (2002, 25) income inequality, indicated by the Gini index, has “significant and positive effect on the incidence of violent crimes (robbery and homicide).” It means that the larger the social income gap is—measured by the Gini Index which indicate the degree of national income inequality—the higher the crime rate is expected to be. Therefore, to verify whether UBI is improving the social equality and making our society better, it is easy to look at the crime rates as a empirical data related to UBI’s effect on income gap. Similarly, another World Bank scholar team found the positive relationship between Gini index and the homicide rate, especially when data was collected from drug-related areas (Enamorado 2019, 19). In short, the crime rate at certain regions can be a good type of data to estimate UBI effect on society not only because such crimes are often related to severe income inequality and poverty issues, but also because these crime rates are sufficed for empirical studies.

### **III. Positive Argument**

In this section, I will use a mathematic model, based on a World Bank study on crimes rate

and income inequality, to estimate the effect of UBI on crime rates. To begin with, I will introduce the World Bank study by Fajnzylber et al. and how it worked as the basis of the model used in this essay. Then, I will present a new model based on the study of Fajnzylber et al. with some alternation on regression variables, which is called the UBI Effect on Crimes Rates (UEC) model. After that, I will provide an expectation of the results. Since UBI has not been implemented at a large scale and my resources are limited to collect enough data, I'll make an educated estimation according to existing researches on how UBI might impact the factors (the independent variables) so that I can speculate the influence on crime rates (the dependent variable). Later, I will list the real results from current UBI experiments conducted both domestically and internationally. Lastly, I will discuss the drawbacks of this model and possible direction of future research.

A. The basis from a former study that UBI Effect on Crime Rates (UEC) model is based on

In 2002, Pablo Fajnzylber, Daniel Lederman, and Norman Loayza conducted a study about the effectiveness and causality of the relationship between income inequality and violent crime worldwide. This study aimed to explore the correlation between the Gini index and homicide and robbery rates among selected countries, with consideration of issues of time series, endogeneity effect of income inequality on violent crimes, and measurement of errors (Fajnzylber 2002, 1). In terms of methodology, Fajnzylber et al. developed a dynamic model that has the violent crime rates (robbery and homicide) as dependent variable and income inequality—expressed by the Gini Index—as the estimator or independent variable (2002, 36). Since those countries that

Fajnzylber et al. collected data from have strong diversity for being located at different continents, their model controlled the effect on crime rates due to specific country effect. Also, the impact from time series is also with their consideration, because this model measures the dynamic effect of the change in income inequality. Other possible errors such as endogeneity of income inequality—that is, the possibility that the Gini index is affected by other unconsidered factors), and the measurement error due to uncertain proficiency of investigators are also taken into consideration. For simplicity and ease of measurement, the UEC model will assume there is no specific country effect and thereby the UEC model is expected to function unbiasedly in estimation within one region rather than cross-section comparison.

## **B. The UBI Effect on Crime Rates (UEC) Model**

To develop an accurate mode, it is necessary to consider the factors such as time, exogeneity and measurement error. This section is structured to take four steps and develop the premilitary model to a mathematical linear regression function that provides the most accurate empirical expectation.

In the first place, it is necessary to state the basic requirements for the UEC model and empirical UBI experiment. Similar to Fajnzylber's study, the UEC model will use panel data, a type of data containing different observations (states) and variation through time (collectedly annually). By doing so, it can manifest a more general effect of UBI by collecting data from countries all over the world with a given time period—for instance, five years. Then, the experiment can be divided into controlled group and experimental group. In this paper, these two

groups have to be a city or region based on similar population, economic conditions (per capita GDP or average household income), size in terms of area, and level of crime rate.

In the second place, a preliminary UEC model can be formed based on the study of Fajnzylber et al. Basically, the preliminary UEC model is the function to estimate crime rates via OLS (ordinary least squares). In other words, the UEC model measures the linear relationship between crime rate and income inequality through regression analysis. Intuitively, it can help to measure how much the crime (robbery or homicide) rates is expected to change, given the change in income inequality where we use Gini index to represent. The advantage to use this method is that its quantitative preciseness provides robust support of our hypothesis—that UBI might be helpful for reducing crime rates—from an empirical perspective.

The primary UEC model is given by:

$$\widehat{CrimesRates} = \alpha_0 + \alpha_1 IncomeGap + Error$$

$$\text{or: } y^* = \alpha_0 + \alpha_1 X_i + \xi, \quad (D1)$$

where  $y^*$  represents the “true” crime (homicide or robbery) rate,  $X_i$  is the set of explanatory variables—in this case it is the Gini index,  $\xi$  is the unexplained residual/error which explained the discrepancy between our estimation and the actual crime rates,  $\alpha_0$  is what we call intercept in mathematics, which indicate the crime rate as a constant without considering the income inequality. That is, when the Gini index equals to zero (no income gap in this data set), the crime rates is expected to be  $\alpha_0$  percent. As for  $\alpha_1$ , it is what we call slope or coefficient of estimator, meaning that the crime rate is expected to change by  $\alpha_1$  percent given the income gap (Gini Index) is increase by 1 unit.



The third step is to add the instrument variable, which is the dummy variable on whether this region selects recipients for universal basic income. This step is to eliminate the noise—information from the data that is unrelated to the variable and disturb our observation. For basic definitions, the dummy variables are instruments, especially in regression analysis, who take value of 1 or 0 to indicate the absence or presence of some categorical variables affecting our estimation. For example, if a respondent in this survey answers “yes” or “no” for smoking history, the dummy variable “smoker” will take the value of 1 for “yes” and 0 for “no”. Thus, the dummy variable called “UBI” can be understood based on the value it takes: “1” means the observation (respondent to our survey) receives UBI while “0” means he/she does not. By doing so, the model is able to tell the exact effect on crime rates as the consequence from receiving UBI. In addition, the recipient who receives UBI in the surveyed region is randomly selected, because this model needs to create an instrument variable—a variable designed to reduce disturbance from unexplained data. Because of having instrument variable, the model can provide a more precise estimation than using ordinary method. The reason why UBI can be an instrument variable is: firstly, it is valid in econometric sense that recipients of UBI are randomly selected so that it shows the real effect of UBI rather than the semblance that criminals commit less crimes to receive UBI and back to normal crimes once they receive it; secondly it is relevant to income gap because even receiving UBI based on random selection—rather than providing UBI to all residents—can improve the regional income gap by raising the average income among low income group. Hence, the model is:

$$\widehat{CrimesRates} = \beta_0 + \beta_1 IncomeGap + \beta_2 UBI + Error, \quad \text{or}$$

$$y^* = \beta_0 + \beta_1 X_i + \beta_2 UBI + \zeta \quad (D2)$$

where  $y^*$  represents the “true” crime (homicide or robbery) rate,  $X_i$  is the Gini index,  $E$  is the dummy variable for receiving UBI (1 for yes and 0 for no),  $\zeta$  is the unexplained residual/error which explained the discrepancy between our estimation and the actual crime rates. This model helps to provide an estimation of the impact of income inequality on crime rates solely due to UBI effect.

To give a more intuitive interpretation, we can divide them into following groups, where the model tells:

- The expected crime rate due to income inequality where the residences don't have UBI:

$$\beta_0 + \beta_1$$

- The expected crime rate due to income inequality where the residences don't have UBI:

$$\beta_0 + \beta_1 + \beta_2$$

The last step of the UEC estimation strategy is to consider the effect of time. That is, the model above (D2) only evaluates the instant effect of UBI policy on crime rates. However, it is also possible that the impact on local crime rates from UBI can last more than one year. For example, the regional income inequality in 2019 may have been alleviated because the household deposit for low income group increased due to the basic income given to them in 2018. Hence, for a more precise estimation, the model has to consider time series.

$$\widehat{CrimesRates}_{it} = \beta_0 + \beta_1 IncomeGap_{it} + \beta_2 UBI + Error$$

$$y_{it}^* = \beta_0 + \beta_1 X_{it} + \beta_2 UBI_{it} + a_i + u_{it} \quad (D3)$$

$$y_{it-1}^* = \beta_0 + \beta_1 X_{it-1} + \beta_2 UBI_{it-1} + a_i + u_{it-1} \quad (D4)$$

Everything in this new equation remains unchanged, except the lower notation “it” indicate that the equation evaluates data from different observations (cities/regions) and data taken in different time in terms of years. Thus,  $y_{it}^*$  is still the expected crime rates,  $IncomeGap_{it}$  is the Gini Index, and the  $UBI_{it}$  is the dummy of the presence of UBI. The only difference between equations D3/D4 and previous equations is the error term  $a_i$  which will be eliminated later, which indicates time-invariant factors like violent culture or gang culture. The notation “t” and “t-1” represent the expected crime rates in year t and year t-1. In other words, they show different expected crime rates in one year and the one after (for example, the year of 2018 and 2019). With the method called first difference method—subtracting D3 by D4, we can have a more accurate estimation by considering the effect of UBI through time. That is:

$$\Delta y_{it}^* = \Delta \beta_1 X_{it} + \Delta \beta_2 UBI_{it} + \Delta u_{it} \quad (D5)$$

From the equation D5, the UEC model is complete and the most accurate among equation D1-5. The interpretation of the coefficient  $\beta_1$  and  $\beta_2$  is the same as before: the impact on crime rates due to income inequality (Gini Index) and due to the existence of UBI. The point of equation D5 and the whole UEC model is to provide an unbiased mathematical tool that consider disturbance from effect through time and endogeneity—effect that cannot be qualified.

### C. Expectation of the result

Due to the limit of time and resources, this paper chooses a way that combines existing researches about the income effect on crime rates and current results from actual experiments all over the world.

1. Estimation on the relationship between factors (estimators) and crime rate (dependent variable)

Firstly, the income inequality is expected to fall. The fundamental concept of UBI is to reform the taxation and distribution system so that the poor can be better off while the relatively rich will pay more in terms of marginal tax or value-added tax. Theoretically, the income gap is going to be alleviated as the UBI and tax reformation are carried out. As Parjis mentioned, “the key condition is simply that, relative to their numbers (not necessarily to their incomes), the relatively rich should contribute more to its funding than the relatively poor.” (Ackerman et al., 2000, 9). This would hold no matter the institution applies a progressive income tax, a flat tax or a Value Added Tax (VAT). Therefore, this intuitive expectation can be reflected in our UEC model mentioned above. The variable “ $X_i$ ” or “income gap” represented by the Gini index is anticipated to drop. Based on the kinds of crimes considered by the UEC model is homicide and robbery, which is under the category of violent crime significantly driven by economic inequality (Fajnzylber et al., 2002, 46). Consequently, the crime rates are supposed to decline.

Secondly, the effect of UBI existence is assumed to be negatively related to crime rates. As mentioned in literature reviews, the implementation of UBI can largely contribution to both one’s negative and positive liberty, whereby reduce one’s risk to commit crime due to economic reasons. That is, the right to choose one’s own lifestyle with less paternalism constraint if receiving subsidies from the administration. For example, it may help one to get rid of the unemployment trap because of a lower marginal tax rate by receiving UBI (no tax included) and minimum wage compared to being taxed for getting minimum wage while losing unemployment

subsidy. Meanwhile, UBI can also contribute to one's positive right to realize one's life goal such as affording covering commercial insurance, supporting higher education, funding start-up business. For example, a study in Malawi, Indonesia, conducted by Hanna and Olken from Harvard and MIT, indicated that the unconditional transfer payment is instrumental to reducing teen pregnancy rate compared to targeted payment, because teen girls who dropped out of school had to work in positions with high risk of early pregnancy. It is the unconditional cash payment that supported them with better protection tools and funds to change jobs or go back to schools. Hence, in terms of liberty, UBI is expected with positive contribution to individual liberty and thereby improve one's optimism toward life in the future. It is also verified in the UBI experiment in Finland that the basic income recipients were reported to have better self-estimation to the future and future financial status. As a result, the better future expectancy is, the less likely one tends to commit crimes. As reflected in the model, by receiving UBI the residents are believed to have more confidence in personal financial status and the rule of law, which means  $\beta_2$  is negative and helps to reduce crime rates.

## 2. Verified observation on UBI predicted by UEC model

Given the complicity of the regions that implements UBI, it is better to think about the effect in different categories, like level of development, among the UBI experiments conducted worldwide and through different scales of time.

The first way of observation is based on economic conditions. In developing countries, the UBI effect on crime rates seems to be more instant and obvious. In Namibia, the effect of UBI on crime rates is dramatic. Haarmann et al. found a significant decrease in crime rates after the

introducing of UBI, especially in the category of economic crimes (2009, 49). Their data is provided by a local police station called Omitara police station, covering the crime data from January 2008—the beginning of implementing UBI—until December 2008. For example, the most drastic decrease is found in the crime rate of illegal hunting and trespassing, which dropped by 95% from 20 reported to 1. Another example is stock theft, which is normally considered a kind of economic crimes, taking a proportion of 60% among all crimes reported after 6 months since the introduction of UBI 6 months and 47% of all crimes reported after one year of introducing the UBI plan (2009, 47). Moreover, the majority of respondents (75%) noticed a change in the crime situation after the UBI plan started. Similarly, even in developed countries, UBI is conducive to strengthen factors that help to neighborhood security. In Finland, Kangas, Jauhiainen and Simanainen examined the effect of UBI among unemployed workers, with controlled groups between recipients of UBI and those who don't. The data shows that people who receives UBI have slightly higher trust in other people, the legal system and politicians. Also, it manifests a significant stronger confidence in “self-perceived estimation of one's own future, one's financial situation and one's own ability to influence matters” (Kangas et al., 2019, 19-20). Hence, in the first year of Finish UBI plan, it is not observed to have significant effect to reduce unemployment rate. However, it is noticeable that UBI recipients' quality of life is improved, and the social recognition toward them, as well as their attitudes towards future. Considering the lower crime rates in Finland relative to developing countries, such result of UBI is still believed to be a contributory factor in reducing crime rates.

The second way of observation is through the length of time. The experiments mentioned

above is carried out for a whole year at maximal. To find the long-term effect of UBI, Richard Dorsett researched on the impact of Alaska's Permanent Fund Dividend (PFD) on crime. This PFD fund, as a kind of basic income to all residents in Alaska, has been introduced in 1976 and started since 1982. Dorsett conducted two empirical approaches, and the result implied "increasing the Dividend reduces property crime for an extended period." (2019, 35). In Dorsett's opinion, the scale of time (weekly or yearly) and the sensitivity of basic income size are crucial elements in exploring the social outcome of basic income. And he concludes that the Dividend (basic income) is sufficiently implied by results to reduce property crime for an "extended period" and a higher level of payment level may result in lower rate of property crime. Hence, both in long-term and short-term scales, the UBI is proven to be influential in bringing down the crime rates related to economic inequality and poverty.

In fact, the UBI functions more than a one-time stabilizer in crime rates. In the context of crime, inequality and unemployment, the change in the level of crime rate can either reinforce the stability of a neighborhood or encourage committing new crimes—known as Broken windows theory. A dynamic model provided by Burdett et al. implies a straightforward takeaway: "if you live in a neighborhood with lots of crimes, the relative returns to legitimate activity are low and this encourages crimes." (2003, 1777). That is, once the violent crime rates is brought down after the introduction of UBI, it is of high likelihood to generate a compound effect that lower crime rates can reinforce people's confidence to the neighborhood they live in and encourage stability and order which leads to an even lower crime rate.

Overall, the UBI effect predicted by UEC model is verified both in terms of economic

conditions and different time scales. In developing countries, UBI seems to have relatively more instant and obvious effect in reducing poverty and economic crime rates. In long period, UBI is believed to be helpful in lessening poverty crime, though the amount of UBI is also a crucial factor to consider.

#### **IV. Direction for future study**

However, model itself have some drawbacks. To begin with, the endogeneity of optimism that may be intervened by the error term. For instance, the optimistic attitude towards life may not be result of UBI but factors like family background, education level, or culture. Hence, it may need more research on whether the optimism is brought by UBI. Then, it is also possible that recipients' future expectancy may come from distributive justice by taxing more on the rich while living standards remain unchanged for recipients from lower income group. In that case, the existence of UBI only serves to be a tool to revenge rather than a effective tool to bring actual improvement for people with lower income. Last but not the least, we need more empirical data while the reality is that UBI experiments are carried out at a small scale and lack of reliable data under a long-term observation. These are all good points that future research may take into consideration.

#### **V. Conclusion**

This paper has introduced the idea of universal basic income (UBI), the reason and benefit of having UBI with regard to liberty and justice and take the case of crime rates as an example



for UBI to improve this society with a mathematical tool and existing studies for verification.

The theoretical origin of UBI can be trace back to the idea of egalitarianism, and is developed by Thomas Paine in his Social dividend Theory: all members of a community deserve the right of the dividend from the economic development as a result of obtaining natural resources—a shared property of all members in the community—in the primitive accumulation of capital. In terms of justice and liberty, UBI is believed to be beneficial because it satisfies to John Rawls' principle of justice benefit the least advantaged group in the society and broaden one's individual liberty in Isaiah Berlin's theory of negative and positive liberty—the right to choose one's way of life and pursue one's life goals in the case of UBI. The question then goes on to how people verify and measure the effect of UBI to improve our life. As a significant indicator of the social inequality, residents' satisfaction towards their neighborhood and the governance level of the administration, violent crime (robbery or homicide) rates are believed to be ideal sample data because of the ease to be quantified and significant relationship to social inequality. Based on previous studies, this paper provides a model called UEC (UBI Effect on Crime Rates) model, which believes income gap represented by Gini index is positively related to violent crime rates and the effect due to the introductory of UBI is contributory to bring down crime rates. Limited by resources and time, this paper takes former studies about UBI and inequality and existing experiments conducted globally to verify predictions given by UEC model. The result is as follows: firstly, UBI is implied by evidences that have positive influence in reducing economic crimes; secondly, the UBI effect on crime is relatively more significant in developing countries and in long-term, nevertheless, generally contribute to optimistic future expectancy and trust in the government

and laws; thirdly, the amount of UBI and period of observation are crucial controlled variables.

Given the imperfection of current studies, it is still sufficient to say that UBI is not an unrealistic utopian idea but a deliberated and possible solution to contemporary social issues such as income inequality and radical xenophobia towards immigrants because of the income gap and lack of job opportunity. Also, it is significant to enlarge one's individual liberty especially for those problems in welfare states like poverty trap and unemployment trap.

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