Research on the Main Factors Affecting Income and Its Implications

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Abstract-Inflation in the United States continues to soar. On the one hand, the wealth of the top 1% of high-income people has increased significantly; on the other hand, the problem of homeless people has become increasingly rampant, and lowincome families bear serious financial pressure. The problem of income disparity is growing in the richest country in the world [1]. Based on the comprehensive analysis of more than 40000 pieces of data and 15 attributes, this paper systematically investigated the influencing factors and mechanisms behind the income gap. Education promotes the value of human capital and makes income premium; Marriage enhances people's sense of responsibility and has a positive impact on income; The rapid growth of salary premium in financial and high-tech industries has widened the industry wage gap; Together with the continuation of inequality effects of traditional variables such as race and gender, they have distorted the pattern of income and wealth distribution in the United States.

Index Terms—Income disparity, Factors affecting income, Education, Gender, Race, Occupation, Marital Status

#### I. Introduction

THE issue of income disparity and its influencing factors are not only a hot topic of widespread concern in the are not only a hot topic of widespread concern in all walks of life, but also a key topic of research for policy makers and scholars, and it has an important impact on economic development and social stability. Since the 1970s, the widening gap between the rich and the poor and the increasing polarization in the United States has brought a series of social problems, especially the subprime mortgage crisis in 2007, which made people pay more attention to the household debts of low-income people and the factors affecting their income [2]. A scientific measurement of the income distribution gap and an analysis of the causes of this gap can provide a scientific basis for the government to formulate reasonable income distribution policies, rectify the order of distribution and reform the financial and taxation system, and at the same time provide reference suggestions for individuals to make career choices, improve income and quality of life, and enhance personal happiness, which is of great theoretical and practical significance to promote social harmony and stability and sustainable economic development.

At present, the research on factors affecting income is relatively scattered, and most generally mention that the increase of income gap is the result of the joint action of many factors, among which there is probably no "key factor" [3]. There is no quantitative conclusion on the impact of the increase of the income gap.

On the basis of reading a lot of theories that affect income, this paper starts with analyzing the personal factors that affect income gap, focusing on the analysis of five key factors that have a greater impact on the income gap: education, marriage, race, occupation and gender, and expounds their impact on the income gap, trying to enlighten the social level in exploring effective tax systems and welfare policies.

# A. Data Set

Our income data set comes from the Kaggle platform and contains more than 40000 pieces of data which have 15 attributes, after data cleaning and analysis, we found the 5 main factors that have the greatest impact on income: education, marriage, race, occupation and gender, and made a more in-depth analysis one by one.

## B. Focused research questions

The focused research question is the relationship between five key factors in this data set and income, mainly including education, gender, race, occupation, and marital status, as well as the deep reason behind the relationship.

## II. BACKGROUND/RELATED WORK

In fact, many other researchers have done research on the impact of various factors on income. Some predecessors also put forward many widely accepted theories.

## A. The effect of education on income

There are many theories that examine the relationship between education and income. For example, the signal model of higher education believes that education can effectively reflect people's ability, and workers with more education are more capable of working than those without much education [4]. Going to college is just one way to showcase their talents and ability to work. In other words, going to college is an important way to gain recognition from others. As long as they are highly talented, they can do well in their jobs in the future. The level of education of a worker can indicate his ability to work to a certain extent, so most workers with higher levels of education earn more than those with lower levels of education [4]. As another example, the human capital theory holds that investment in education is the core of human capital, and it is a productive investment that improves the ability hidden in the human body [5]. Education can improve people's knowledge and skills, increase productivity, and thus increase personal income [5]. Another theory is the labor market segmentation theory. It considers that the labor market is divided into the labor market and the non-labor market. In the main labor market, the education level of the labor force is relatively high,

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and the proportional relationship between education level and wage level is basically established [6]. But in the secondary labor market, education and wage levels are not necessarily positively correlated [6]. People with higher education have a good chance of entering the main labor market, and the higher the education level in the main labor market, the higher the wage level [6].

## B. The effect of marriage on income

What many people don't know is that marriage also has a big impact on income. A research project once investigated many large enterprises and found that after removing the influence of age, the average salary of married employees is a part higher. For the same number of years of service, married employees are more likely to be promoted than unmarried employees. Researchers have proposed several different explanations for this phenomenon. First of all, being married means greater responsibility and financial pressure, and employees will work harder. In other words, married people tend to climb the job ladder faster [7]. At the same time, married people are more likely to give people the impression of being stable and reliable, and they will have more opportunities in the workplace. In addition, maybe being married makes men more effective, since women still do most of the housework so men can focus more on their careers [7].

## C. The effect of race on income

Although the United States abolished slavery very early, and the United States of this era is also very pursuing equality and political correctness, income inequality between races still exists.

Racial income inequality has a lot to do with history. Although there is no racial segregation system now, most blacks in the United States are still concentrated in poor areas, whether rural or urban. In the United States, most funding for KM schools comes from state governments. State governments distribute school funding unequally, but according to local government taxes. The wealthier the area, the higher the taxes, the more public schools, the more funding, and the better the quality of education. Taxes are low in poverty-stricken areas, public schools have little funding, and schools without funding have a poor environment and cannot hire good teachers. No wonder so many students are not getting a good education. If you don't study hard, you won't find a good job and you won't make money. Residents, local governments, and schools remain impoverished, forming a vicious circle.

### D. The effect of gender on income

Right now, regardless of the survey, the median income of men is slightly higher than that of women.

Part of the gender pay gap is that women are more likely to take breaks in their careers to have children or to seek lowerpaying positions that offer greater flexibility and make household management easier. Factors that can affect the gender pay gap include unconscious bias and discrimination against women. Many women said they had experienced sexism at work, while not many men said they had experienced sexism at work. Secondly, the survey found that the income of men and women is not equal. Very few women say they earn less than men in the same job, and very few men say they earn less than women in the same job. Women with children also earn less than men with children or women without children.

# E. The effect of occupation on income

The experience of the United States in the past forty years is that finance and high technology seem to be industries with higher returns than manufacturing. Specifically, in terms of finance, only asset management has a higher rate of return than high-tech industries and manufacturing. In other words, if you can't go to asset management, the long-term returns of the high-tech industry are better. The authors also point out that after 2005, the high-tech industry's salary premium has grown rapidly, and returns have become similar to those of asset management. Wage gaps in these industries persist, even after controlling for individual labor force characteristics. In other words, the choice is more important than hard work. The choice is also relatively sticky, and most people work in one industry all their lives [8].

### III. DATA CLEANING

Now that we have the data, this is the stage where we need to examine it to determine if it is a usable data set and what type of work we need to put into it. The condition of the data set will most likely make or break the visualization. The main tasks during the process of data examination are to check the data types, missing values, size of the data set, ranges of values, trustworthiness, integrity, and completeness of the data set

There are 43957 rows and 15 columns in the raw data set but there are also some missing values. After examination, as shown in Table 1, there are 2498 missing values (5.6%) in the "workclass" column, 2506 missing values (5.7%) in the "occupation" column, and 763 missing values (1.7%) in the "native-country" column. Because the missing values account for only a small portion of the data set, we can simply drop them.

Then we check the distribution of some important numerical variables in the data set, such as age(Fig. 1.), educational-num(Fig. 2.)(educational-num: education as Integer; education: education level(bachelor, doctor, etc)), and hours-perweek(Fig. 3.). The overall distributions of these variables are reasonable and no noticeable exceptions and outliers are identified. As for the completeness and integrity of the data set, after deleting the rows that contain missing values, all the values are in reasonable ranges. Besides, there are 15 factors, like different workclass, educational backgrounds, and genders, in the data set that may influence income, which is comprehensive.

After the examination and data cleaning process, the final size of the data set is 40727 rows, and 15 columns.

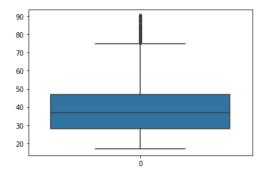


Fig. 1. Age distribution

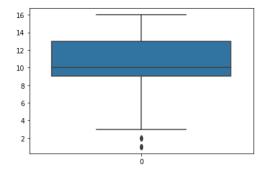


Fig. 2. Education distribution

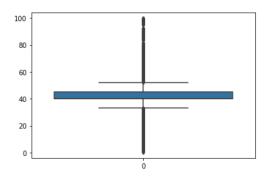


Fig. 3. Working hours distribution

## IV. DESCRIPTIVE STATISTICS

First, we should get an overview of the data set. We calculate the mean and median of some numerical variables. The median age of the interviewees is 37, which means that most of the interviewees are at a stage where they are married or older single people. This is an age when most people live a stable life so the result of these data would be more general and of a greater reference value. Besides, the mean and median of the educational-num are 10.1 and 10. Combined with the distribution of the educational-num, this data set is mainly about people with medium and high education levels.

Then we calculate a correlation matrix of all the numerical variables in the whole data set to find out if there are any related variables. The correlation matrix is a useful tool to check the relationship between variables in the data set, which is a foundation to explore the data later. From the matrix, it can be seen that there is a relatively high correlation

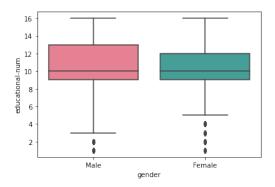


Fig. 4. Education vs Gender

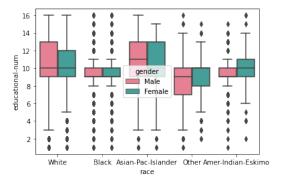


Fig. 5. Education vs Gender Race

coefficient between "income>50k" and "educational-num", which indicates that a high education level may create high income and we will explore this further. From the correlation matrix, we know that whether income is higher than 50k is related to people's educational-num. From this point of view, we may expect a relatively high average income from the data set.

#### V. DATA VISUALIZATION

From Fig. 4., the educational level of male and female interviewees are overall the same. To be specific, the differences are that the minimum bound of the female is higher than the males. The Q3 (75th percentile) of the males is higher than that of females. From the boxplot above, it can be concluded that there are fewer female interviewees whose educational level is very low. However, the ratio of highly educated male interviewees is larger than that of female ones. According to the correlation matrix, maybe we can expect a higher income among male interviewees.

Now, let's take race and gender together into consideration. From Fig. 5., it is easy to find out that the White and Asian-Pac-Islander's general educational levels are higher than the other races. However, it may be a result of the relatively small amounts of data on these other races. If the dataset is too small, biases are almost inevitable. Actually, in the United States, White and Asian-Pac-Islander have a larger chance to receive a high level of education, as displayed in the result of the boxplot. According to the sociologist of education and anti-racist activist Barry Troyna, society and the

Columns	total missing	ratio of missing
workclass	2498	0.056828
occupation	2506	0.057010
native-country	763	0.017358
-	TABLE I	

MISSING VALUES

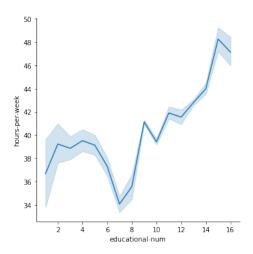


Fig. 6. Working hours vs Education

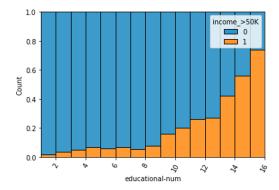


Fig. 7. Income vs Education

role of schooling perpetuates a system of racial inequalities in education and beyond, which is a noteworthy problem so the complex and pervasive influence of racism in education which the contributors draw attention to necessitates both short and long term antiracist strategies [9].

As seen in the line chart Fig. 6., from educational-num 7, there is a strong positive correlation between hours-perweek and educational-num. This phenomenon indicates that the high income of highly educated people not only simply resulted from their advanced degrees but also their hard work. It is reasonable that along with the advancement of education, people will be more and more aware of the principle that labor creates value. Besides, as shown in the histogram Fig. 7., there is a strong positive correlation between educational-num. However, as we stated above, there is pervasive educational inequality in society. It is always harder for some races to get a better education. However, it is also common sense that students from richer families have easier access to better

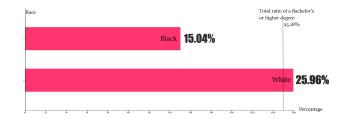


Fig. 8. Education vs Race

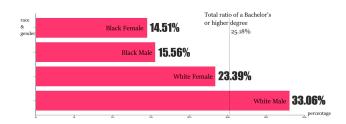


Fig. 9. Education vs Race Gender

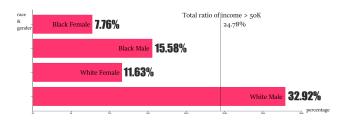


Fig. 10. Income vs Race Gender

education, which will create a vicious circle.

Then we will check the relationship between Education and race. From Fig. 8. we can see the ratio of the Black race who receive high education is much lower than the average level. Many black people in the united states are still concentrated in poor areas, so there would be lower tax revenue for the government to build public schools, which may lead to some local people's poor education.

Now let's take gender into consideration. From Fig. 9., we can see that there is also an unbalanced distribution related to gender, which may reflect the unbalanced education resources between males and females, it is more obvious in the white race, which we will explore further in the inference.

Done with the education, now we will talk about income. From Fig. 10., we can see that there is an even more unbalanced distribution of income related to gender combined with race. We can see that White male is much more likely to get a higher salary. However, it's interesting that white females' advantage to a relatively high degree is not reflected in income compared with a black males, which may indicate that gender issues in the workplace are more urgent to be solved.

Then we will explore marital status. From the bar chart

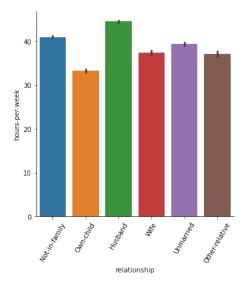


Fig. 11. Working hours vs Relationship

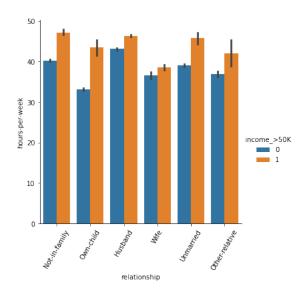


Fig. 12. Hours Income vs Relationship

Fig. 11., it is interesting that when people get married, their working hours even increase. Besides, when people have children, their working hours dramatically decrease. The probable reason is that when they get married, people have more responsibility to support the family, so they work harder to relieve the financial burden. Then we check the income from Fig. 12., as stated above, the average salary of married employees was 12% higher. Married employees are 34% more likely to be promoted than unmarried employees for the same length of service. However, after giving birth to children, people should spend time with their children, which makes the working hours decrease.

This is another interesting phenomenon in Fig. 13. that couples without children have a far higher ratio among the people whose income is more than 50k. Combined with the former chart about the working hours per week, it is reasonable that couples work harder and stimulate each other to earn a

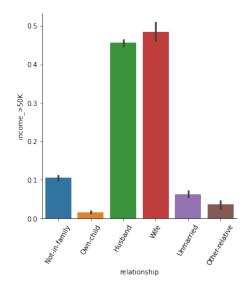


Fig. 13. Income vs Relationship

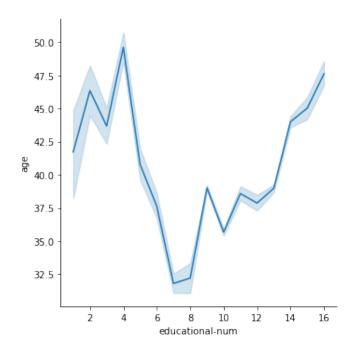


Fig. 14. Age vs Education level

higher salary.

### VI. FINAL INFERENCES

Through the data visualization, we have some interesting discoveries about the relationship between income and social factors. The first important thing is that the sample range of this income data set did not pick randomly. In this data set, 85% of the samples are white people, 10% black, and only 5% of others; The number of males is almost twice as many as the number of females; The range of sample's age is 17-90, and most are under 45. The non-random sample can make our analysis result inaccurate and even biased.

### A. Effect of education on income

The Royal Swedish Academy of Sciences awarded the 2021 Nobel Prize in Economics to three economists, David Card, Joshua D. Angrist, and Guido W. Imbens, in recognition of their outstanding contributions to empirical labor economics research and causal reasoning methods. They take advantage of the fact that early-born students can legally leave school earlier than later-born students. Those born earlier tend to be less educated and have lower incomes. This leads to the study's conclusion that taking an extra year of education can increase earnings by 9% [10]. So how does more education raise people's income levels? Or, why do more educated people tend to earn more?

First of all, we think it has something to do with the fierce competition. Many jobs, although most people can do better if they are taken seriously, many people will submit because of the higher income of these jobs. For screening purposes, employers will prefer to use candidates with higher degrees. You can think of this as an academic introversion, but it's also an objective fact of the day. Secondly, there are many jobs that require relatively high academic qualifications. For example, doctors are a very high-income industry, but to become a qualified doctor, years of education are required, because doctors are not allowed to make mistakes in their work, and once they make mistakes, they will kill people. Therefore, the level of doctors must be relatively reliable, and this requires years of education. Also, when it comes to job advancement, people with higher levels of education tend to have higher chances of advancement. One reason is that people with a high level of education tend to have higher comprehensive qualities and are more likely to stand out at work. Another reason is that when other performances are similar, leaders are often more willing to promote people with higher education because there is no other comparable. Finally, the ability to move across industries is more evident only for highly educated people. This era is an era of rapid development, and the income gap between various industries is very large. Highly educated people tend to be better learners and are better able to gather information. Therefore, if they are in an industry with insufficient income, the possibility and success rate of switching to a higher-income industry will be

Based on our data, we draw more conclusions. According to Fig. 7., it seems people with higher educational level work more hours per week as universally known, but people with the educational level of 11th and 12th year of school work the lowest time every week. This is a surprise finding that people with the lowest educational level work more hours. However, as we can see from Fig. 15., the average age of people taken 1-8th years of school are ten years higher than people in 11th and 12th grade. That means there are fresh high school graduates counted in this data set and many elders who only received primary education. People who have the highest income are in educational levels of 1. Doctorate, 2. Professional school, 3. Masters. People in the preschool level of education have the least ratio of earning more than 50k. As in common sense, income has a positive correlation with educational level.

People who receive higher education have more opportunities to get better jobs with higher salaries. That's why people are struggling to study at better schools. There are some people who believe education is not important. They joke that elementary school dropouts have become bosses after several decades of social life, while college students have to work for them after graduation. But through the analysis of the income data set, only a few cases of people with low education have good jobs, the others do not get high wages.

## B. Effect of gender on income

Overall, gender gaps remain large in terms of employment, working hours, and wages. There are many reasons for this.

First, gender-specific legal restrictions are prevalent in some countries, including women's Legal obstacles to economic activity. The Women, Business and the Law 2018 report monitored 189 economies and found some restrictions for women in 104 of them [11]. Thirty percent of economies restrict women from working in jobs considered dangerous, difficult, or morally inappropriate, 40 percent restrict women from working in industries, and 15 percent restrict women from working night shifts. Especially in many countries in the Middle East and North Africa, there are many legal restrictions on women's work. Second, fiscal policies that disfavor second earners in households can limit women's participation in the workforce. When the government taxes families rather than individuals, having two people working in a family obviously suffers a lot from tax policy. In addition, women often need to take on more tasks of educating and caring for children in the family. This can greatly affect their progress in the workplace, and they can even be fired for taking care of children and affecting important work. This potential effect also makes employers more willing to hire and promote men.

There comes a question. As we know education level has a positive correlation with income, while males have a relatively higher educational level than females and also higher income. Husbands' weekly working hours are also higher than wives'. Can we assume that men earn more than women because they are better educated and work harder? We have a discovery through Fig. 9. and Fig. 10. when it takes both race and gender into account with income. That may help us to answer the question. We can see white males have the highest ratio of Bachelor's or higher degrees, which is 33.06\%, while Black females have the lowest ratio which is 14.51%. White males obviously have the highest ratio of income over 50k, which is twice the ratio of the high-income Black males. However, the high-education level ratio of White females is about 8% higher than the Black male, but the high-income ratio of the White female is about 4\% lower than that of Black male.

Although White females are more educated than Black Male, this advantage does not reflect on their income. We can see how much gender affects education. It is even larger than education and race. As Robin states: "The U.S. census data released in September confirmed that the harshest effects of the gender wage gap continue to fall on women of color, with many of them experiencing the largest gender pay gaps among all workers" [12], the discrimination influence the most

on the women of color. Despite the fact that Black women and Black men have about the same level of education, the number of high-income Black women is only half as many as high-income Black men. Especially during the devastating COVID-19 pandemic, women of color are needed to provide much-needed service and sustain families throughout the pandemic, but their income was "just a fraction of what their white and male counterparts earn" [12].

## C. Effect of race on income

When we compare whites and blacks together, we find that overall whites are more likely to receive an inheritance, more highly educated, and less likely to have single parents. These may be important reasons for the income gap between whites and blacks. In addition, there is also prejudice in the workplace.

According to this data set, white people and Asian-Pac-Islander have a higher income than the other races, while they also have higher educational levels than the other races. This seems back to talk about the relationship between education and income, but it also comes to a question similar to the one we raised in gender: How does race discrimination affect income? It seems that Blacks' income is affected by their relatively lower education level, but what role does race discrimination play in affecting their income? As June Ellenoff indicated that the income of Blacks is surely lowered by discrimination, but "Jewish and Japanese Americans, for instance, have had incomes substantially above those of white non-Jewish groups, despite evidence of discrimination against them" [13]. Race discrimination may have different influences on different races.

Through our research, we found race discrimination is changing with society and politics. Take Black and Jewish as an example, Jewish used to experience discrimination in schools, bank loans, and jobs as black people are experiencing now, and they were even massacred several times hundreds of years ago, but in modern times, Jewish were no longer discriminated such seriously. Jewish merchants are playing a large role in different areas like Hollywood movies. What's more, racism against Jews came out for very different reasons from the racism against Blacks. Like what they are usually portrayed in movies: "Blacks have been portrayed as criminals, maids, or fools. Jews have been portrayed as wimps, manipulators, or "princesses" [14]. The discrimination act on Jewish is mainly about their different religious beliefs and especially their shrewd mind. Jews are very good at making money in business, and they can often find ways to get rich. In this case, they don't need to earn money through the usual means of being employed, so workplace discrimination doesn't stop them from earning. On the contrary, Blacks are discriminated against because in people's stereotypes they are good at labor but not intelligent enough. It is true that rare Blacks can find a way to make money by starting a business or taking a new path. That means their income is influenced a lot by discrimination. Low economic conditions, against by discrimination, and not being intelligent make many Blacks unable to access good educational resources. Then it comes into an uneasily breakable loop for their education and income.

## D. Effect of marriage on income

Income is also related to gender and marital status as mentioned in the previous studies. This may be due to the following reasons. First, being married means greater responsibility and financial pressure, and employees work harder under this pressure. Secondly, married people are more likely to give people the impression of being stable and reliable, so they will have more opportunities in the workplace. In the end, good people are more charismatic and capable, which allows them to get married and make their careers run smoothly.

A phenomenon is that males have relatively higher salaries than females, not only because of some gender discrimination and also females' life status after they have children. People work more hours after they get married, but the time decreases when they have children. This could happen because people have more pressure for living and preparation for raising children after marriage, but it will take a lot of time for parents to spend in the family when they have children.

Another interesting phenomenon is that combining marriage, occupation, and income, marriage has a "negative" impact on people with very low income (such as waiters and cleaners) or very high income (such as business owners), while it has a "positive" impact on people with an annual income of about 50k. We suspect that this is related to the marriage tax penalty policy. According to this policy, for those without children, when both spouses have income, the punishment occurs at the very low or very high end of the income spectrum. Compared with staying single, they may end up paying 4\% more federal taxes, which means their aftertax income will be reduced. And childless couples who earn between \$37000 and \$171000 a year and receive standard deductions are usually not punished. In fact, they can even get marriage tax benefits of up to 6% or more compared with staying single [15]. Therefore, although they are all legal marriages, it seems that only some couples with extreme incomes have been hit in terms of income.

### E. Effect of occupation on income

From Fig. 12., we found that in most instances, people who work more hours per week have higher income, as people always said hard work is rewarded. However, combined with what we had before, although people with education levels of 11th and 12th grade work relatively lower hours per week, their income is not so low compared to people with less education. That means even though many people with low education have to work hard every day, they don't make a lot of money. Most of them can only work the service occupation, like driver, waiter, and cleaner, which are tough but not profitable. People engaged in management and professional specialty are more likely to have higher incomes. One thing that surprises me is that the occupations in protected areas like armed forces and protective services also have relatively high incomes.

# F. Conclusion

Overall, income is related to many social factors like educational level, working hours, gender, race, and marital status. These conclusions are considered working for most white people as the samples are not representative. When we are studying the relationship between each factor and income, we found that all of these social factors and income are interacting with each other. It is difficult to discuss these factors separately. There are several other factors that play roles in affecting income besides the environmental forces and normal human behaviors that we mentioned. Dale stated "public policy may exert a positive influence on reducing income inequality through economic policy that promotes economic growth" [16]. Policy, taxation, and some uncontrollable factors like COVID-19, and war, also need to be taken into account when we want to have a more comprehensive study about income. Those aspects are not included in our data set. Hope we can have deeper research about this in the future.

# VII. SOLUTION

Generally speaking, people's income will vary greatly due to the influence of various factors. The huge income gap is actually a kind of unfairness, and it will also increase social instability. Therefore, we propose the following actions in an effort to reduce income inequality.

## A. Solutions for education equality

The government should increase public education expenditures so that more people can have the opportunity to obtain adequate education so that people can obtain better education with lower tuition fees. In addition, the government should publicize the importance of education in society, so that people realize the great significance of education in life.

More specifically, the government should increase financial input to open welfare schools and professional technical schools with high school education and above, guarantee the right to education for children from low-income families, and enrich their employment options. At the same time, the government can establish talent training programs for ethnic minorities and vulnerable groups to alleviate the shortage of talents and income constraints in low-income areas and vulnerable groups. In addition, the government can continue to improve the education subsidy system and tuition fee reduction policy. Establish a funding system that combines scholarships, student loans, tuition fee reductions, and free education. At the same time, the government should simplify the social assistance procedure. Students from families with financial difficulties will be given living allowances not lower than the minimum wage standard in the school's location. 100\% coverage of basic education expenses for students from extremely poor families.

#### B. Solutions for gender equality

The first step is to remove legal restrictions on gender. Earlier research has found that legal equality increases female labor force participation. Specifically, enacting constitutional gender equality could increase female labor force participation by as much as 5 percent. The second is to revise the tax policy.

Taxing individuals rather than households would remove disincentives for second earners in households, often women, to work. This will encourage more women to join the workforce.

In addition, well-designed family benefits must be implemented. Improving parental leave and providing high-quality, affordable childcare will make it easier for women to find employment. Japan has taken several steps to increase female labor force participation, including increasing parental leave benefits from 50 percent of salary to 67 percent [17]. Governments can also increase public spending on education. When women spend less time educating their children, they are likely to be more engaged in the workplace.

## C. Solutions for marriage equality

Fixing the effect of marriage on income is almost impossible. Spending time with families is a necessary thing for everyone. There is one thing that needs to be considered is the prejudice of some companies towards marriage and pregnancy. In China, some interviewers will ask the single female interviewee what time will she plan to get married and will she plan to have a child. If she cannot provide a satisfactory answer, she will not be hired because the company does not wish her to ask for a long maternity leave. Such factors should not be a condition for not being hired.

## D. Solutions for race equality

Race discrimination has become a hot topic for a long time, but it seems to be a problem that cannot be solved at its root. There are some ways people can do for minimizing the influence of discrimination act on employees. For example, trying to make sure that all of the choices are fair, like recruiting by both human interviewers and machines, and minimizing the discrimination that may be generated through humans and the algorithm. The government can help on improving the quality of public education, which helps Black children to get free education. What's more, raising estate tax also works for decreasing the racial wealth gap.

### E. Solutions for occupation equality

Decreasing the income gap generated by occupation is also a complex problem that needs to be addressed in many ways, such as the government's policies for making the income tax system more progressive, raising the federal minimum wage, and strengthening the earned income tax credit or establishing a universal basic income program.

#### REFERENCES

- [1] "The hilltop review," 2012. [Online]. Available: scholarworks.wmich.edu
- [2] "International review of financial analysis," 2016. [Online]. Available: https://scholar.google.com/citations?user=I9Qmm9oAAAAJ&hl=zh-CN&oi=sra
- [3] A. Fan, "The british journal of psychiatry," 2001. [Online]. Available: https://scholar.google.com/citations?user=DD3XK0EAAAAJ&hl=zh-CN&oi=sra
- [4] M. Spence, "Job market signaling," 1973.
- [5] S. Ross, "What is the human capital theory and how is it used?" March 2021. [Online]. Available: https://www.investopedia.com/ask/answers/ 032715/what-human-capital-and-how-it-used.asp

- [6] D. G. M Reich and R. Edwards, "A Theory of Labor Market Segmentation," The American Economic Review, 1973.
- [7] S. SKILLS, "Married people earn more than single individuals. here's why." January 2022. [Online]. Available: https://bigthink.com/smart-skills/married-wage-gap/
- [8] M. P. Andrew Ellul and A. Scognamiglio, "Careers in finance," December 2021. [Online]. Available: https://www.csef.it/WP/wp561.pdf
- [9] "Racial inequality in education," 2012. [Online]. Available: https://books.google.com/books?id=DSD6ltdoKkAC&printsec=frontcover&hl=zh-CN#v=onepage&q&f=false
- [10] D. Card, "The causal effect of education on earnings," 1999. [Online]. Available: https://davidcard.berkeley.edu/papers/causal\_educ\_earnings.pdf
- [11] W. B. Group, "Women, business and the law 2018," March 2018. [Online]. Available: https://openknowledge.worldbank.org/ entities/publication/cb0e703f-bcaf-5f47-ae5e-5fd194df5fa4
- [12] R. K. Robin Bleiweis, Jocelyn Frye, "Women of color and the wage gap," November 2021. [Online]. Available: https://www. americanprogress.org/article/women-of-color-and-the-wage-gap/
- [13] J. E. O'Neill, "Discrimination and income inequality: Social philosophy and policy." January 2009. [Online]. Available: https://www.cambridge.org/core/journals/social-philosophy-and-policy/article/abs/discrimination-and-income-inequality/D9FF0F6142053E717001B2E8DAB85DD9#access-block.
- [14] A. S. Deborah Kaufman, ""blacks & jews" blacks jews facilitator guide," 1997. [Online]. Available: https://newsreel.org/guides/blacksan. htm
- [15] R. Townsend, "Money and marriage: How getting married changes your finances," October 2022. [Online]. Available: https://www.valuepenguin. com/money-and-marriage
- [16] D. O. Cloninger, "What factors influence income inequality?" July 2016. [Online]. Available: https://theconversation.com/what-factors-influence-income-inequality-61837.
- [17] V. M. Chotani, "Five years on, where does abe's 'womenomics' stand?" July 2017. [Online]. Available: https://jia.sipa.columbia.edu/ online-articles/five-years-where-does-abes-womenomics-stand