Income inequality between OECD countries

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Abstract

In this paper, a special Gini coefficient is designed to study the status and trend of income inequality among OECD countries over the past ten years, based on the average annual wages of 34 OECD member countries from 2011 to 2021. Calculations and analyses show that income inequality among OECD countries deepened progressively from 2011 to 2013, peaking in 2013, and easing each year from 2014 to 2021. the 2008 financial crisis and the ensuing European debt crisis are some of the main reasons for the deepening of income inequality in the first three years, while the outbreak of the COVID-19 pandemic in 2020 is one of the main reasons for the increase in income inequality in the first three years. The COVID-19 outbreak in 2020 does not deepen inequality but continues the previous trend of moderation.

Key words: income inequality, Gini Coefficient, OECD countries

1 Introduction

As an important organisation for economic cooperation and policy coordination among market economies, the OECD's level of economic development among its member countries is of great practical significance for economic cooperation among member countries. Income inequality, as an important inequality measurement factor, has an important impact on policy coordination and trade cooperation among countries, therefore, it is necessary to explore the issue of income inequality among OECD countries. The OECD, as an intergovernmental economic co-operation organisation of market economies, plays an important role in the development of the world economy and the

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functioning of the world market, and the member countries of the OECD, although all of them are market economies, differ greatly in terms of their positions in the global value chain and terms of the situation of their economic development. From a club of developed countries in its infancy, the OECD has gradually moved towards a diversified group of developed and developing countries, working together to promote global regional economic coordination and the development of the market economy, and to maintain the stability of the global industrial supply chain. Thus, governmental coordination among the OECD is the key to dealing with many regional economic problems and national economic development, and the OECD can also serve as a window through which we can observe the development of the world market economy.

The issue of inequality in economic development among different OECD countries will have a direct impact on the position and policy decisions of government departments in regional coordination and co-development. At the same time, as a window on the market economy, the inequality problem in OECD countries can also be used as a perspective for observing the inequality of economic development around the world, so that the problem can be extended and learnt from in the global value chain and global economic coordination with the participation of more countries, and the global economic inequality problem can be better solved. Therefore, it is valuable to study inequality among OECD countries, especially in the recent decade when the international economic situation has fluctuated dramatically, inequality among countries will change in different ways, and more variables will make the regional economic coordination and cooperation among governments full of uncertainty, and understanding the trend of inequality among countries during this period will help the economic cooperation among governments to be carried out on a more stable basis, and will give more references to the formulation of economic policies of all parties.

In this paper, I will consider the changes in income inequality in OECD member countries from 2011 to 2021 from the perspective of OECD inter-country. This period encompasses the period from the recovery from the 2008 financial crisis and the European debt crisis to the New Crown Pandemic, and there are many variables in this period that have the potential to create shocks to the income of the population and income inequality between countries. In this paper, 34 OECD countries were selected for the study (Chile, Turkey, Colombia and Costa Rica were not included in the study due to lack of data among the 38 member countries), which covers the average annual income data of most of the OECD countries from 2011 to 2021. The level of economic development of the countries studied is evenly distributed.

In terms of methodology, this paper also makes some innovations. This paper uses a special Gini coefficient as a tool to study income inequality among OECD member countries. This Gini coefficient is based on average annual wages ranks OECD countries in descending order, and can quantify income inequality among OECD countries more scientifically. Meanwhile, this paper will also introduce other data to support the illustration of the data processing results and the trends and phenomena found. Based on the above methodology, this paper computes the special Gini coefficient and the change curve of income inequality among OECD countries for the decade from 2011 to 2021. The results show that the Special Gini coefficient among OECD countries shows an increasing trend from 2011 to 2013, representing the deepening of income inequality among countries; after reaching the highest point in 2013, the Special Gini coefficient declined year by year from 2014 to 2021, and income inequality among countries appears to be narrowing. Although the rate of decline slows from 2019 to 2023, it remains in the declining range.

Combining the relevant data with the article, two important events may have a significant impact on income inequality between countries. One is the European debt crisis following the 2008 financial crisis, which led to a massive contraction of social benefits in many European countries and a large contraction of average incomes of residents in OECD countries that were hard hit by the European debt crisis, while the incomes of residents in OECD countries with a favourable debt situation were not much affected, thus leading to a gradual deepening of income inequality in the period 2011-2013. With the debt adjustment and the economic situation gradually getting rid of the financial crisis, the economic development of each country has been improving. The problem of income inequality has been further improved. The gap has been reduced, and the economic situation of the developing countries in the OECD in the past ten years has been improving, which has also contributed to the improvement of the problem of income inequality.

The COVID-19 pandemic in 2020 did not deepen income inequality among OECD countries but rather reduced it to some extent. The main reason for this is that the rise in per capita income levels in the rich countries was not as large as it could have been because mortality rates did not differ significantly between rich and poor countries and because government subsidies and relief for the pandemic were concentrated in the low-income groups. As a result, the special Gini coefficient shows a downward trend in 2020 and 2021[1].

The innovation of this paper is to introduce a new special Gini coefficient to explain the problem of inter-country income inequality, which more intuitively reflects the changes of inter-country income inequality in different periods and thus helps to further study the causes of inter-country income inequality according to the data changes and economic facts. It would help to further adjust policies to common shocks faced by countries and to better organise and coordinate efforts to improve income inequality between countries. It should also be noted that this article simplifies the variables examined and treats each OECD country as an independent whole for the calculation and study of the special Gini coefficient, which means that the inequality within each country is not shown in this article. The possible impact of the inequality problem within the country still needs to be further examined.

2 Literature Review

The issue of income inequality among OECD countries has received increasing attention since the 1990s. Snower (1999) proposes a framework for examining wage structure and overall income inequality that emphasises the impact of market supply and demand factors and the interaction between markets and institutions and applies this framework to assess wage changes among OECD countries [2]. Jean and Isabell (2012) show that an increase in the proportion of workers with a high school or post-high school non-tertiary degree, as well as an increase in the proportion of workers on permanent contracts, are associated with a narrowing of the earnings distribution [3]. The study made by Chen, Förster, and Llena (2013) shows that growth in the supply of skilled workers has helped to reduce wage gaps between workers, while technological advances, globalisation pressures and systemic changes have led to increased income inequality [4]. Azzollini, Breen, and Nolan (2023) suggest that changes in specific demographic factors between countries can account for more than 40 per cent of changes in household labour income inequality between countries, with the proportion of households headed by single women playing the largest role [5]. The largest driver of cross-country inequality is related to the earnings of partnered men.

Since the COVID-19 pandemic, income inequality among OECD countries has again taken a different shape. Chen, Gozgor, and Koo (2021) consider that the World Pandemic Discussion Index (WPDI) is positively correlated with income inequality in 34 OECD economies [6]. Research from Clark, d'Ambrosio and Lepinteur (2021) shows that absolute inequality also declined during the pandemic [7]. As a result of the pandemic, some families lost more than others, and the Government's compensation programme targeted the poorest families, which meant that the average income gap narrowed. For countries with a large share of tourism, the vulnerability of tourism in a pandemic may affect income inequality. Sun, Li, Lenzen, Malik, and Pomponi (2022) claim that the collapse of international tourism has exacerbated short-term income inequality within and between countries due to unequal economic burdens across groups, incomes and regions [8].

3 Data and Methodology

To provide a comprehensive study of income inequality in OECD countries, especially the state of change before and after the COVID-19 pandemic, this paper chooses the average annual incomes of 34 OECD countries over ten years from 2011 to 2021 as the basis of my study. The dataset contains data on the average annual wage per employee in full-time equivalent units (FTEs) in the total economy. The average annual wage per full-time equivalent dependent employee is obtained by dividing the total national accounts-based wage bill by the average number of employees in the total economy, which is then converted to FTEUs using the ratio of the average usual weekly hours of work per full-time employee to the average usual weekly hours of work of all employees. Data are for the base period 2021, converted to United States dollars at 2021 purchasing power parity (PPP). In addition, to aid in the analytical illustration, data on inequality and income in other OECD countries were selected for this paper, including annual average wage growth, decile ratios of gross earnings, and incidence of low and high pay. these data were obtained from OECD Data Explorer and OECD Statistics, the official databases of the OECD organisation.

This paper uses a special type of Gini coefficient to measure the income inequality that exists among OECD countries. Since OECD countries are composed of a wide range of countries from different regions with different levels of development, this atypical Gini coefficient used to measure income inequality in OECD countries is also instructive about the changes in income inequality in the world economy before and after the pandemic. This special Gini coefficient is shown below.

$$G = \frac{1}{n}\left[n + 1 - 2\left(\frac{\sum_{i=1}^{n}(n+1-i)w_i}{\sum_{i=1}^{n} w_i}\right)\right] \times 100 \tag{1}$$

where w_i is the average annual wage in each country, and n=34. The formula here describes the calculation of the general Gini coefficient, and the special Gini coefficient structure is consistent with the general Gini coefficient. This coefficient is calculated by sorting the average annual incomes of the OECD countries for each year from smallest to largest, and then summing them up one by one, which can be viewed as adding up the areas of trapezoids; finally, the difference between the area of the lower triangle minus the area of the trapezoid is divided by the area of the lower triangle.

Based on the formula above, we can derive the Gini coefficients based on average annual incomes for the 34 OECD countries from 2011 to 2021. The following table shows the results of the calculation of the special Gini coefficient for each year.

Table 1: Special Gini coefficient based on average annual income for OECD countries (2011-2021). [Owner-draw]

Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Special Gini Coefficient	19.6	19.9	20.0	19.9	19.5	19.1	18.9	18.5	18.0	17.9	17.8

The results of the above calculations are plotted as shown in Figure 1 below.

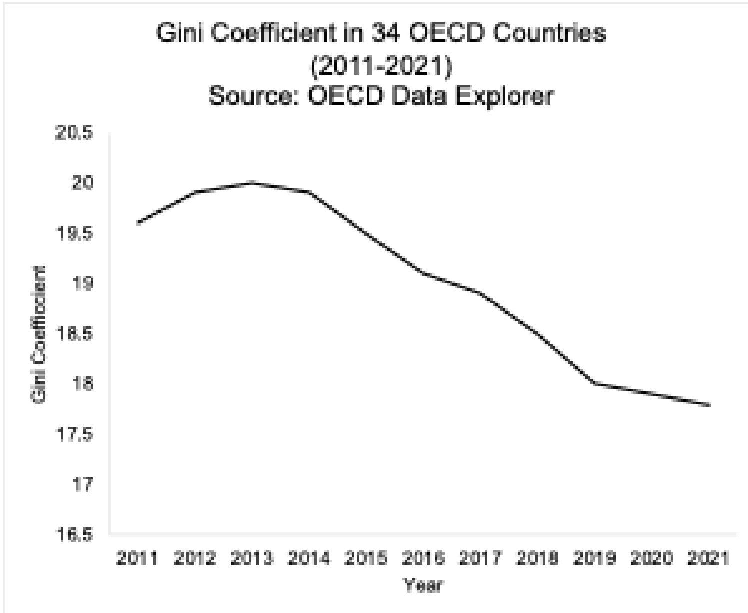

Figure 1: **Special Gini coefficient based on average annual income for OECD countries (2011-2021). [Owner-draw]**

As can be seen from the data we have derived with the plotted image, the special Gini coefficient among the OECD countries shows an upward and then a downward trend during the decade from 2011 to 2021. Income inequality between countries peaks in 2013 and then enters a contractionary range, with the contraction slowing down after 2019. This contractionary trend continues even during the 2020 COVID-19 pandemic.

4 Discussion

4.1 The European debt crisis and income inequality

Income inequality among OECD countries deepened dramatically in the years between 2011 and 2013, and the special Gini coefficient peaked in 2013. During this period, Europe was mired in a deep debt crisis, and cuts in social benefits severely contributed to a significant reduction in real average annual incomes in some of the countries with severe debt crises. The main impact of the European debt crisis has been a sharp contraction in government public spending and social welfare. At the same time, the financialization of the economy since 1990 and the increasing flexibility of labour supply and demand have weakened labour market institutions as trade unions have shrunk in power [9]. The sharp contraction of public spending during the crisis could not compensate for the vulnerability of national economies to globalisation in the aftermath of the financial crisis. As a result, during the European debt crisis, the real incomes of the population in the crisis countries, especially those of the income groups that are more dependent on social benefits (mostly lower-middle-income groups), experienced a significant contraction [10]. Real average annual wage growth turned negative.

At the same time, countries in the OECD group that were less affected or unaffected by the European debt crisis have gradually recovered from the financial crisis, their economies have begun to recover, and real average annual wages have risen year after year. The European debt crisis as a common shock was not borne by all OECD countries, and under this effect, the special Gini coefficients of OECD countries rose, signalling a deepening of income inequality between countries. The table below shows the growth in real average annual wages from 2011 to 2013 in five European countries deeply affected by the eurozone debt crisis.

Table 2: Real average annual wage growth in the eurozone crisis countries. [Owner-draw]

	2011	2012	2013
Greece	-6.3	-5.8	-6.5
Portugal	-2.4	-4.3	1.9
Spain	-1.8	-3.2	0.0
Ireland	-1.4	-0.9	-2.4
Italy	-1.6	-3.2	0.3

Note: Source: OECD Statistics

Table 3: Summary statistics of real average annual wage growth in OECD. [Owner-draw]

year	number of observations	mean	variance	max	min
2011	38	0.5	4.7	5.3	-6.3

2012	38	0.0	5.2	4.1	-5.8
2013	38	0.5	5.3	8.2	-6.5

Note: Source: OECD Statistics

It is easy to see from the chart that the countries severely affected by the European debt crisis generally experienced a severe decline in real average annual wages from 2011 to 2013. Greece, as the first European country to experience the debt crisis, experienced a significant decline in average real annual wages for three consecutive years from 2011 to 2013, and for three consecutive years, the decline was the largest among the group of OECD countries. In contrast, the average level of change in real average annual wages in OECD countries has increased, suggesting that some groups of OECD countries have experienced higher wage growth. This could also explain the deepening of income inequality for groups of OECD countries over the three years.

It is important to note that the impact of the European debt crisis on income inequality in the OECD countries has gradually receded since 2014. the decline in real average wages in Greece contracted to 0.4 in absolute terms in 2014, and the decline in real annual average wages in the other European countries affected by the debt crisis has also decreased significantly, with many countries starting to show positive growth. In turn, OECD's real annual average wage growth exceeded 0.5 and surpassed 1 in 2016, achieving an increase of 1.6.

4.2 The COVID-19 pandemic did not exacerbate income inequality

We now focus on 2020 and 2021, the two years of the COVID-19 pandemic. It was previously widely believed that the pandemic would exacerbate income inequality among OECD countries and that poorer countries would see their per capita incomes fall even more than richer ones. But the reality was far from what was expected. Based on the previous calculation of the special Gini coefficient we can see that the pandemic has not changed the trend of shrinking income inequality since 2014. The number of deaths and mortality rates are often overlooked when envisaging income inequality, and as the impact of global value chains is undoubtedly worldwide, the effects of both the pandemic itself and the embargo policy will not only hit poor countries but may also no less severe for rich countries than for poor ones.

Firstly, there is the issue of mortality. Rich countries, despite having better health systems and higher incomes, have not fared so well in responding to the COVID-19 pandemic, with more deaths in rich countries than in poor ones. There is no trade-off between lives and incomes; a decline in the working population inevitably leads to a decline in total income and labour productivity, and more deaths mean a larger decline in national incomes - hence a larger decline in per capita incomes in high-income countries [11]. As a result, income inequality among OECD countries remained in the downward range during the pandemic.

At the national level, mortality is positively correlated with the Gini coefficient of disposable income of the country. In countries with higher levels of inequality, inequality may increase mortality through a more pronounced COVID-19 negative gradient in socio-economic status, through both general and pandemic-specific processes [12]. This also means that within OECD countries, it is not the wealth or lack of wealth of the country that determines changes in per capita income, but rather the distribution of income in that country. Rich countries (e.g., the United States, with a Gini coefficient of 41.5) do not necessarily have lower mortality rates than countries with lower per capita incomes (e.g., Greece, with a Gini coefficient of 33.1). So, during the COVID-19 pandemic, income inequality in OECD countries is reduced by the common shock.

Then there is the issue of government compensation schemes, which is particularly evident in rich countries. COVID-19 will cause some households to lose more income and assets than others, and government compensation, which is mostly targeted at poorer households, will lead to a narrowing of the gap in average incomes. The rich countries did not raise their per capita income levels as a result of the pandemic, nor did the poorer countries experience a larger slippage in per capita income than the richer countries because of the pandemic. Between January 2020 and January 2021, relative inequality in individual equivalised household disposable incomes follows a hump-shaped pattern, from an initial rise in January-May 2020 to September 2020 when it has been reversed. Absolute inequality also declined over this period [7].

5 Conclusion

Overall, based on the calculations and discussion above, the general direction of the overall trend of moderation in income inequality among OECD countries since 2014 has not changed. The predicaments and problems caused by the financial crisis of 2008 and the European debt crisis to the European countries seem to have been properly resolved, and the developing countries in the OECD countries seem to be developing steadily and positively due to friendly and mutually beneficial market conditions. However, some problems existed, particularly in light of the end of the COVID-19 pandemic and the unstable international political situation.

The reduction in inequality presented above over the COVID-19 pandemic period is as of 2021, and its root effect is that the poor performance of the rich countries in mortality control has not led to a large increase in per capita incomes in the rich countries over this period. However, it is doubtful whether the reduction in inequality will be sustained after the end of the pandemic and the stabilisation of mortality. Immediately following the pandemic came a global economic downturn, and the downsides of many of the pandemic's economic stimulus policies began to show. The war in Ukraine and the highly unstable geopolitical situation also added to the already weakened national economy. Inflation is high in many rich OECD countries, the cost of living for residents has risen sharply, and real incomes are shrinking. The financial systems and economies of the relatively less developed countries are even more fragile, and it is not clear whether they can recover as quickly as possible after being hit by external shocks. Under the influence of many variables, whether income inequality among OECD countries can continue to contract in the future still depends on whether the influence of that kind of factor is stronger.

It was also a matter of concern that income inequality among OECD countries had not narrowed in recent years by raising the national incomes of relatively underdeveloped countries, but rather by shrinking per capita incomes in the rich countries. This means that the level of economic development of the OECD countries as a whole has regressed to some extent. Reducing inequality would not be beneficial to the development of the world economy if it was not a matter of addressing poverty but of addressing affluence. Therefore, how to achieve the poor countries' income improvement and maintain the income stability of the rich countries is the focus of the future income inequality solution. This is also what the governments of OECD countries need to consider in light of the current economic and geopolitical problems in the world.

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