sustainability

MDPI

Article

Welfare State Spending, Income Inequality and Food Insecurity in Affluent Nations: A Cross-National Examination of OECD Countries

Md Belal Hossain [1], Michael A. Long [1,*] and Paul B. Stretesky [2]

[1] Department of Sociology, Oklahoma State University, Stillwater, OK 74078, USA; belal.hossain@okstate.edu
[2] Department of Social Sciences, Northumbria University, Newcastle upon Tyne NE1 8ST, UK; paul.stretesky@northumbria.ac.uk
* Correspondence: michael.long@okstate.edu

Abstract: Few studies examine the distribution of food insecurity in advanced capitalist nations. This research investigates cross-national food insecurity in the world's largest economies by estimating the impact of welfare spending and income inequality on food availability (measured by the FAO's Dietary Energy and Protein Supply indicators) and food accessibility (measured by the Food Insecurity Experience Scale) in 36 Organization for Economic Cooperation and Development (OECD) countries between the years of 2000 and 2018. Using a series of regression models on panel and cross-sectional data this research found that increases in state spending on social and health care are associated with (1) increases in food availability and (2) increases in food access. However, the findings also suggest that increases in food supplies do not produce more food security. Thus, for the OECD countries in this analysis, food availability is unrelated to food accessibility. We conclude by suggesting that high income countries that seek to promote global health should not only focus their efforts on poverty reduction polices that increase food accessibility within their own boarders, but must simultaneously ensure a more equitable global distribution of food.

Keywords: food insecurity; welfare state spending; income inequality; neoliberal reform; cross-national research; OECD countries

Citation: Hossain, M.B.; Long, M.A.; Stretesky, P.B. Welfare State Spending, Income Inequality and Food Insecurity in Affluent Nations: A Cross-National Examination of OECD Countries. *Sustainability* **2021**, *13*, 324. https://doi.org/10.3390/su13010324

Received: 3 December 2020
Accepted: 29 December 2020
Published: 31 December 2020

1. Introduction

In recent decades, the primary focus of food insecurity research has shifted from availability of an adequate supply of food, to how food is distributed [1], which is deeply embedded in political-economic relationships [2]. When it comes to cross-national research this reorientation focuses more attention on food insecurity in affluent nations that tend to have a disproportionate amount of the world's available food per capita [3,4]. That is, a significant proportion of people living in affluent nations are food insecure and find it difficult to get "access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life" [5]. The existence of food insecurity in affluent countries might appear surprising as these countries also tend to have more extensive welfare systems [6] and charity sectors that provide food [7]. However, Riches ([8], p. 7) observes, "reduced access to food is a growing phenomenon in affluent First World countries." While research on food insecurity in affluent nations has predominately used a case study approach [9–12], a better statistical understanding of the drivers of food availability and access among affluent countries is necessary [3,13–17]. Currently few studies examine the cross-national patterns in the international political economy that shape the distribution of food both within *and* between nations (except see, for example, [18,19]).

The purpose of this research was to examine the predictors of food availability (measured by the Food and Agriculture Organization's (FAO) dietary energy supply and dietary Protein Supply) and food accessibility (measured by the Food Insecurity Experience Scale

(FIEC)) in 36 Organization of Economic Cooperation and Development (OECD) countries, with a focus on welfare spending and income inequality. Specifically, we examine if and how social and health spending and income inequality are associated with national measures of food availability and food access. The remainder of the paper is organized as follows. First, we briefly review the literature on country-level examinations of food insecurity. We then highlight the roles of welfare state spending and income inequality on the level of food insecurity in a country and provide hypotheses based on these arguments. Then, we discuss the methods, analytic strategy and results. Finally, we situate our findings in the existing literature and suggest directions for future research.

Food insecurity occurs when people have restricted access to an adequate supply of nutritious and culturally appropriate food [20,21]. Food insecurity is usually measured as a combination of indicators. Two important food insecurity indicators are food availability and food access [22,23]. Food availability addresses the importance of inadequate food supply in the market and potential increasing food prices, affecting access to food for those in poverty [1,13]. It is important to note, however, that adequate food availability alone cannot explain food insecurity. In particular, all 36 OECD countries have adequate levels of available food even while many people are unable to access that food [5].

The FAO measures availability using two indicators called the dietary energy supply and the dietary protein supply at the national level [24]. These indicators estimate the amount of available food (and protein) supply for consumption at the national level, which is expressed in kilocalories per person per day. The required amount of daily dietary energy per person is 2200 kilocalories [25]. However, as noted, there is variation in food supply across countries. For example, in Haiti the average daily energy supply is estimated to be less than 1850 kilocalories per day while it is 3800 kilocalories per day in the United States [25]. Importantly, these estimates do not include adjustments for food loss and food waste, suggesting that average levels of food consumption are likely much lower than the actual supply.

Until recently, cross-national food insecurity indicators were largely constrained to food supply because there was a general lack of national level data on food access. In particular, for several decades, previous cross-national research primarily used FAO's data on the prevalence of undernourishment as an indicator of hunger and food deprivation [26]. Some researchers have tried to overcome this lack of indicators by locating other sources of data. Loopstra and colleagues [18,19], for instance, used data from the Survey of Income and Living Conditions Eurostat to study food insecurity in 21 EU countries. The main measure of food insecurity they used was based on a survey question, "can your household afford a meal with meat, chicken, fish (or vegetarian equivalent) every second day?" While this captures some amount of food insecurity, the authors themselves noted, this measure, "does not specify duration of exposure nor capture multiple dimensions of food insecurity ([18], p. 45), however at the time of the study, that was the only available indicator of food insecurity available for a cross-national sample of developed countries. Recently, however, this situation has changed.

In 2019, the FAO released data on food insecurity for the period 2015 to 2018 covering the OECD countries. The FAO collected data on the prevalence of food insecurity using the Food Insecurity Experience Scale (FIES), FIES, which consists of eight self-report items that together measure food access [27]. Because the FIES scale is about food access it measures a different component of food insecurity than other indicators, such as those that focus on food availability. In particular, respondents can be categorized along a continuum from being "food secure" to suffering from "severe food insecurity" based on their level of access to food. Crucially, FIES can be aggregated up to a national level and is used to estimate the prevalence of "moderate" and/or "severe" food insecurity [5] at the country, region or global levels of analysis [28]. These two categories (moderate and severe) of food insecurity are often combined together to create an overall "prevalence of food insecurity" measure among adults in selected countries [5]. These data suggest that in 2017, approximately eight percent of people living in OECD countries were food insecure using the combined

moderate and severe food insecurity categories, with a minimum of 3% in Japan and a maximum of 28% in Mexico. In short, a considerable percentage of the population in many OECD countries can be classified as moderately or severely food insecure because they lack access to food [18,29]. Importantly, the availability of this new food insecurity data allows for novel cross-national research on food insecurity in affluent countries. Using these new FAO data, the current paper examined the association between a host of independent variables, and the access component of food insecurity in OECD countries.

Over the last two decades, a substantial body of cross-national research has examined food insecurity in less developed countries (LDCs). These studies have discovered associations between measures of food insecurity and indicators of militarization, economic modernization, world-systems/dependency, neo-Malthusian, techno-ecology, stratification/inequality, and urbanization [15]. Past empirical research has found that economic modernization is associated with increases in food availability [30] and decreases in child hunger [3,14] and the intensity of food deprivation [31]. Scholars using a world systems/dependency perspective discovered that trade dependency and agricultural export flows to high income nations were associated with increases in the severity of hunger in LDCs [32]. Mihalache-O'Keef and Li [33] showed that primary-sector foreign direct investment (FDI) was related to reductions in food security while manufacturing sector FDI was associated with improvements in food security in LDCs. Militarization, measured by military expenditure, has been shown to be related to increases in food insecurity in developing nations [30,34] as well as in the world as a whole [31]. Measures of the equality of women are associated with increases in the levels of food security [3,16,17], while population pressures are related to reductions in the availability of food and increases in hunger in developing nations. [14,34].

These studies have made important contributions to the understanding of food insecurity from a cross-national comparative perspective. However, they rely on samples of developing nations, with the justification that hunger overwhelmingly exists in low-income nations. While the majority of the world's hungry people live in less developed nations, the FAO of the United Nations [5] reported that 8% of the populations of North America and Europe are moderately or severely food insecure.

A rich case study literature that focuses on understanding food insecurity in affluent nations has developed in recent decades. An excellent example of this approach is the collection of country case studies organized around the food as a basic human right perspective in Riches and Silvasti [29]. In this volume, the findings suggest that the vast majority of affluent countries have failed to follow through on guarantees of food as a basic human right to all citizens.

Another strand of this literature focuses on the relationship between the welfare state and food insecurity. For example, analyzing Norway and Australia, Richards, Kjærnes, and Vik [4] find that Norway's response to food insecurity, as a social democratic welfare state, is robust through its social security support, agricultural policy, and food price regulation while Australia, as a liberal model of the welfare state, leaves the responsibility of food entitlement to individuals and charitable organizations. Riches [8] documented similarities in government responses to food insecurity in the USA, UK, Canada, Australia, and New Zealand, finding that these countries adopted welfare reform to reduce social expenditures. Loopstra et al. [35] found that food insecurity among low-income adults in the UK has worsened since 2004, and that unemployment, disability status and low income were associated with severe food insecurity in the country.

In, what to our knowledge, appears to be the first cross-national studies of food insecurity in affluent countries, Loopstra et al. [18] and Reeves et al. [19] examined predictors of food insecurity in a sample of European nations. Loopstra et al. [18] examined food insecurity in 21 European nations from 2004 to 2012 and found that economic hardship was associated with increases in food insecurity, however increases in social protection alleviated some amount of food insecurity. In a related study using the same data, Reeves et al. [19], discovered that a combination of rising food prices and stagnating wages were related

to increased food deprivation, however, similarly to Loopstra et al. [18], countries with better funded welfare systems were able to mitigate some of the negative impacts on their citizens. From these studies, it appears that welfare state spending may help reduce food insecurity, at least in a sample of European nations. We now explore why that may be the case.

The welfare state is generally understood as a form of government in which the state takes an active role in providing for the economic and social wellbeing of the citizens of the country through spending on social programs and health and other mechanisms of income redistribution [36]. The post WWII period, from approximately 1945 to 1975, has been called the golden age of the welfare state [37,38], as much of Western Europe and North America favored Keynesian-influenced welfare state models to help recover from WWII. However, when neoliberal policies came into enforcement after 1979, welfare spending substantially diminished across industrialized nations.

Neoliberalism is a political-economic ideology that favors free markets and little to no state intervention [39,40]. As countries adopted neoliberal policies, increasing emphasis was given to market-based solutions, including, measures to encourage labor market participation and the privatization of many social programs, including those in the education and healthcare sectors. Policy shifted from a model with substantial social support to one where the focus was on individual choice, freedom and free markets [8]. While neoliberal economic policies have become commonplace across the developed world, research has documented that some level of welfare state efforts continued to persist [41].

To date, only a few studies exist that have examined the relationship between welfare state and food insecurity as measured through food availability and food accessibility. As noted, the current research investigates the predictors of food availability (measured by the FAO's dietary energy supply and dietary protein supply indicators) and food accessibility (measured by the FIES). As we have discussed earlier, Loopstra et al. [18] and Reeves et al. [19] both found that increases in welfare state spending were associated with reductions in food insecurity across a sample of 21 countries. These results should be expected as welfare state support is designed to reduce poverty, a point which has been supported by previous research [36,42–44]. This observation leads to our first two hypotheses:

Hypothesis 1 (H1). *Increases in welfare spending will be associated with increases in food availability (and therefore an increase in the dietary energy supply, and an increase in the dietary protein supply) in OECD countries.*

Hypothesis 2 (H2). *Increases in welfare spending will be associated with increases in food accessibility (and therefore a decrease in FIES food insecurity measures) in OECD countries.*

The reduction of welfare state support due to the implementation of neoliberal economic policies often increases income inequality in those countries undergoing transition [39,45]. Piketty [46] suggests that inequality is a fundamental feature of free market capitalism that would need a substantial welfare state to reduce some of that inequality. Research has also found that welfare state spending significantly reduces income inequality in selected affluent democracies [47]. Further, scholars have suggested that inequality contributes to food insecurity in advanced capitalist nations [2]. Along these lines, we forward our next two hypotheses:

Hypothesis 3 (H3). *Increases in income inequality will be associated with decreases in food availability (and therefore an increase in the Dietary Energy Supply, and an increase in the Dietary Protein Supply) in OECD countries.*

Hypothesis 4 (H4). *Increases in income inequality will be associated with decreases in food accessibility (and therefore an increase in the FIES food insecurity measure) in OECD countries.*

In short, the reduction in state welfare support is likely to increase food insecurity by decreasing policies that ensure sufficient food supplies. At the same time increasing inequality means that fewer people have access to available food because of their financial situation.

2. Materials and Methods

2.1. The Sample

Our sample consists of 36 OECD countries (see Table 1 for the list of countries). There are currently 37 OECD countries, however, Costa Rica became a member nation after the period covered by our data. The data available for the different dependent variables have different time periods, resulting in different sample sizes across the models.

Table 1. List of Countries Included in the Analysis (N = 36).

Australia	Hungary	Norway
Austria	Iceland	Poland
Belgium	Ireland	Portugal
Canada	Israel	Republic of Korea
Chile	Italy	Slovakia
Czech Republic	Japan	Slovenia
Denmark	Latvia	Spain
Estonia	Lithuania	Sweden
Finland	Luxembourg	Switzerland
France	Mexico	Turkey
Germany	Netherlands	United Kingdom
Greece	New Zealand	United States of America

2.2. Dependent Variables

As previously noted, the FAO calculates the national estimate of food availability using the Dietary Energy Supply indicators. This national estimate is calculated using the FAO's dietary energy content of food available for human consumption to estimate "kcal/capita/day". While the overall energy supply is calculated based on the total food supply, the FAO also estimates the food supply for individual food groups. As a result, we examine (1) average dietary energy supply and (2) average dietary protein supply.

Average dietary energy supply: This variable is the average dietary energy supply as a percentage of the average required dietary energy. The data on average dietary energy, measured in calories, is normalized by each country's population and is expressed as a percentage of the average dietary energy requirement estimated for its population. We have 18 years of annual data for this variable (2000–2017).

Average dietary protein supply: This variable is the average dietary protein supply in grams per capita, per day. We have 13 years of annual data for this variable (2000–2012).

Food accessibility: As previously noted, FIES is an experience-based food insecurity scale that is meant to measure the access dimension of food insecurity. This variable is an estimate of the percentage of the population who live in households that are identified as moderately or severely food insecure because of a lack of access to food. An Item Response Theory model (the Rasch model) was used for estimating the probability of being food insecure, while classification thresholds are made cross-country comparable by calibrating the metrics for each country against the FIES global reference scale [5]. The threshold to classify "moderate or severe" food insecurity refers to the item "having to eat less" on the global FIES scale. In other words, a household is identified as moderately or severely food insecure when at least one of the household members are forced to reduce the quantity of foods or eat a low-quality diet due to lack of resources to access food. We have four years of annual data for this variable (2015–2018). We model the combined indicator of moderate or severe food insecurity in the analyses.

2.3. Independent Variables

Our first measure of welfare state spending is *public social spending, per capita*. This variable comprises direct in-kind provision of goods and services, cash benefits, and tax breaks for social purposes. Benefits may be targeted at low-income households, disabled, sick, unemployed, the elderly, or young persons. Programs are considered "social" if they involve either compulsory participation or redistribution of resources across households. Social benefits are considered public when governments are involved in controlling the relevant financial flows. The data on public social expenditure is obtained from OECD [48].

Our second measure of welfare state spending is *public health spending, per capita*. This variable is a measure of the final consumption of health care goods and services (i.e., current health expenditure) including personal health care (curative care, rehabilitative care, long-term care, ancillary services and medical goods) and collective services (prevention and public health services as well as health administration), but excluding spending on investments. Health care services are considered public when they are financed through government and compulsory health insurance. The data is obtained from OECD [48].

To measure income inequality, we used the *top 10% income share* using data from the World Inequality Database. Expressed in proportion, this variable indicates pre-tax national income share held by the top 10% of people in the income distribution of a nation. Pre-tax national income is the sum of all pre-tax personal income flows accruing to the owners of the production factors, labor and capital, before considering the operation of the tax/transfer system, but after considering the operation of pension system [49]. The population is composed of individuals over age 20. We chose to use top 10% income share as our indicator of income inequality because it had fewer missing data than the Gini index for the countries and years that we have our other measures for. Top 10% income share is sometimes used in cross-national macro-sociological studies as an indicator of income inequality [50].

2.4. Control Variables

We included the *Gross Domestic Product (GDP) per capita* as a measure of economic development. GDP is calculated by adding any product taxes to and subtracting any subsidies (not included in the value of the products) from the sum of gross value produced by all residents in the economy [51]. Per capita GDP was calculated by dividing total GDP by midyear population. These data were collected from the World Bank and are expressed in constant 2010 U.S. dollars. Research suggests that economic modernization increases food availability in LDCs [30] so we control for that possibility in our data.

As some previous research suggests, military expenditure may affect food insecurity [30,34]. Therefore, we control for *military expenditure*, measured as a percentage of the GDP of a country. We obtained data on this indicator from the World Bank, that uses the North Atlantic Treaty Organization (NATO) definition of military expenditure. According to this definition, military expenditure includes all current and capital expenditures on the armed forces, including peacekeeping forces; defense ministries and other government agencies engaged in defense projects; paramilitary forces, if these are judged to be trained and equipped for military operations; and military space activities. More precisely, such expenditures include military and civil personnel, including retirement pensions of military personnel and social services for personnel; operation and maintenance; procurement; military research and development; and military aid (in the military expenditures of the donor country) [51].

Further, we control for a country's total population, population growth rate, the percentage of the population that resides in urban areas, the level of food imports, the age dependency ratio and the percent of the country's population that is unemployed. Research has shown that population may be associated with food insecurity in the developing world [14,34], so we control for the effects of population using two measures. *Total population* is the mid-year estimate of counts of all residents regardless of legal status or citizenship [51]. The annual *population growth rate* for year t is the exponential rate of

growth of midyear population from year $t-1$ to t, expressed as a percentage [51]. *Urban population* is the percentage of the total population that live in urban areas as defined by national statistical offices [51]. We also control for the value of *food imports*, measured as the percentage of total merchandise exports [5] in the energy and protein supply models only, data was not available on this variable during the years necessary in the food insecurity models), *age dependency ratio*, the ratio of dependents to the working-age population. People younger than 15 or older than 64 are defined as dependents. Data are measured as the proportion of dependents per 100 working-age population [51], and percent *unemployed*. People are considered unemployed when they are of working age but are without work, are available for work, and have taken specific steps to find work. This indicator is seasonally adjusted and is measured in the number of unemployed people as a percentage of the labor force. The labor force is defined as the total number of employed people plus those in unemployment [51].

Lastly, we control for a country's level of democracy, using the *democracy index* from Freedom House. The democracy index measures the extent to which the population of a nation enjoys political freedom indicated by both political rights and civil liberties [52]. The democracy index includes a total of 25 indicators, ten of which are political rights that are classified into three subcategories: electoral process, political pluralism and participation, and the functioning of government. The other 15 civil liberties indicators are grouped into four subcategories: associational and organizational rights, personal autonomy and individual rights, freedom of expression and belief, and the rule of law. Each of these indicators was assigned 0–4 points, with 0 indicating no freedom while 4 indicating the highest level of freedom. Points from the total 25 indicators are aggregated into a score ranging from 0 to 100, with higher values indicating the higher levels of democracy or political freedom in a nation.

2.5. Analytic Strategy

To test our hypotheses about the effects of welfare spending and inequality on measures of food availability and food accessibility, we used annual data from the 36 OECD countries (see Table 1) to model the three dependent variables. The time-period for each of the dependent variables is different due to the (un)availability of data. The data covers 2000 to 2017 for average energy supply, 2000 to 2012 for average protein supply, and 2015 to 2018 for moderate and severe food insecurity. Given these differences, we employ two separate multivariate modeling approaches.

First, we used Prais-Winsten regression models with panel corrected standard error (pcse) to longitudinally model energy supply and protein supply. Prais-Winsten regression models with pcse, by default, assume that disturbances are heteroscedastic and correlated across panels [53]. To correct for first order serial correlation, we specified autoregressive disturbances (AR(1)) common to all panels.

The equation for the Prais-Winsten regression model for cross-national panel data can be expressed as follows:

$$Y_{ct} = \beta x_{ct} + u_c + e_{ct}$$

where Y_{ct} is the dependent variable for each country c and each time period t. β is the coefficient, representing change in Y as a result of a unit change in X (predictor). u_c is the country-specific disturbance term (intercept) that is constant over time. e_{ct} is an error term unique to each country at each point in time.

The use of Prais-Winsten regression approach in cross-national longitudinal models controls for unobserved heterogeneity of nations and is thus robust against omitted control variables [54]. Before we estimated the Prais-Winsten regression models, we estimate Ordinary Least Squares (OLS) regression equations to check for possible multicollinearity. GDP per capita, social spending per capita, and health spending per capita were highly correlated and had high Variance Inflation Factor (VIF) values. Therefore, models were estimated separately for each of these key predictors to reduce the influence of multicollinearity.

We only have four years of data for the moderate or severe food insecurity variable. The small annual sample size (n = 36), coupled with the fact that most longitudinal models create a dummy predictor variable for each cluster (country) in the analysis, causing the required sample size to be larger as the requisite number of cases per predictor requirement needs to be met, led us to use OLS to model moderate or severe food insecurity cross-sectionally. However, due to the presence of inter-cluster correlation or dependence of observations within a country, we specified the standard error adjusted for clustering. This modeling technique is robust against dependent observations across various time periods within a country. We include year as an independent variable to control for period-specific effects. Similar to the Prais-Winsten models, OLS regression models were estimated separately for social spending per capita, health spending per capita, and GDP per capita to reduce multicollinearity. After separate estimates of these models, the highest VIF statistic was 3.55, which falls within an acceptable range [55]. We checked the normality of the residuals with the kernel density plot. The results showed that the errors were approximately normally distributed in all models.

The sample size varies across models due to data availability. We used listwise deletion to handle missing data as this technique produces more conservative estimates. Variables that had high skewness ($\geq$1.0) were transformed into their natural log form to reduce the skewness. We found no influential cases that might substantially affect the results.

There are six models that have been estimated for all three dependent variables. Model 1 examines the effect of social spending per capita on the dependent variables, while Model 2, in each of the tables, focuses on the relationship between health spending per capita and food insecurity. Each Model 3 examines the effect of GDP per capita on the dependent variable, without social and health spending per capita in the models. Including these three variables at the same time was not possible due to multicollinearity.

In the average dietary energy supply models, food imports, top 10% income share, and democracy were excluded from Model 4 through 6 as these predictors have substantial missing data. As a sensitivity check on the results, we model energy supply with those predictors included in the models (Models 1–3) and removed from the models (Models 4–6). Similarly, in the average protein supply models, income share by top 10% and democracy were excluded from models 4 through 6 because of missing data. The exclusion of these variables substantially increases the number of observations in the models. In the moderate and severe food insecurity models, population growth was excluded from Model 1 through 3 while income share by top 10% was excluded from Model 4 through 6 due to data availability. In addition, democracy was excluded from Model 2 as its inclusion produces high VIF values for the model, indicating the possibility of multicollinearity. Table 2 contains the descriptive statistics for the variables in the analysis.

Table 2. Descriptive Statistics for Variables in the Analysis.

Variables	Dietary Energy Supply Models	Dietary Protein Supply Models	Moderate Food Insecurity Models	Data Source	Description
	Mean (SD)	Mean (SD)	Mean (SD)		
Dietary energy supply	133.258 (10.252)	– –	134.069 (9.226)	FAO	% of required dietary energy (calories)
Dietary protein supply	– –	102.292 (12.153)	– –	FAO	Protein supply in grams per caput per day
Moderate food insecurity	– –	– –	1.990 (0.503)	FAO	% of population living in households identified as moderately food insecure
Social spending per capita	7021.282 (3579.282)	6856.085 (3546.776)	8110.479 (3640.357)	OECD	Per capita spending in USD
Health spending per capita (ln)	7.465 (0.682)	7.354 0.682	7.831 (0.580)	OECD	Per capita spending in USD/Logged
Top 10% income share (ln)	−1.079 (0.162)	−1.074 (0.165)	−1.113 (0.124)	World Inequality Database	Income held by top 10% in income distribution/Logged
GDP per capita (ln)	10.319 (0.650)	10.286 (0.667)	10.464 (0.588)	World Bank	GDP/pc in USD/Logged

Table 2. *Cont.*

Variables	Dietary Energy Supply Models	Dietary Protein Supply Models	Moderate Food Insecurity Models	Data Source	Description
	Mean (SD)	Mean (SD)	Mean (SD)		
Military expenditure (ln)	0.369 (0.538)	0.407 (0.536)	0.273 (0.544)	World Bank	% of GDP/Logged
Total population (ln)	16.334 (1.532)	16.320 (1.531)	16.376 (1.521)	World Bank	Number of total population/Logged
Population growth	0.560 (0.786)	0.554 (0.783)	0.577 (0.813)	World Bank	Annual population growth in percentage
Urban population	76.348 (11.229)	75.879 (11.138)	78.545 (10.973)	World Bank	% of population living in urban areas
Food imports (ln)	1.671 (0.487)	1.671 (0.487)	– –	FAO	% of total merchandise exports/Logged
Age dependency ratio	49.775 (5.230)	49.056 (4.904)	52.408 (5.813)	FAO	Ratio of dependents to the working-age population
Unemployed (ln)	1.927 (0.464)	1.919 (0.460)	1.857 (0.465)	OECD	% unemployed population/Logged
Democracy (sq.)	8618.912 (1414.504)	8668.406 (1336.646)	8649.922 (1286.532)	Freedom House	The index ranges from 0 (lowest) to 100 (highest) levels of democracy.

Notes: Due to the three dependent variables having different time periods, means and standard deviations of the variables are reported separately for each of them.

3. Results

Table 3 contains six Prais-Winsten regression equations modeling dietary energy supply, which is our first measure of food availability. Given the large volume of results, we will focus our interpretations of our main independent variables stipulated in Hypotheses 1 to 4. Annual increases in social spending per capita are associated with annual increases in dietary energy supply according to Model 1 ($b = 0.001$, $p < 0.001$) and Model 4 ($b = 0.0005$, $p < 0.001$). Further, annual increases in health spending per capita are associated with annual increases in dietary energy supply as shown in Model 2 ($b = 5.51$, $p < 0.001$) and Model 5 ($b = 2.43$, $p < 0.001$). The social and health spending findings support H_1. In particular, food availability appears to increase with increased welfare spending. This finding provides additional theoretical support to the argument that low levels of welfare spending in OECD countries may decrease food accessibility and lead to increases in food insecurity.

Importantly, and contradictory to H_3, income inequality-top 10% income share-is positively associated with dietary energy supply in Models 1 ($b = 8.77$, $p < 0.001$), 2 ($b = 10.13$, $p < 0.001$) and 3 ($b = 7.91$, $p < 0.001$). Not only is this relationship opposite of what we predict, but statistically significant as well. Thus, it appears that as income inequality increases, there is increasing food availability within OECD countries. This suggests, perhaps, that additional food is available to those in the upper portion of the income distribution, but not those in the bottom portion of the income distribution

The results concerning the control variables are consistent with previous research. For instance, increases in GDP per capita, total population, population growth, food imports and the age dependency ratio are positively related to dietary energy supply, while increases in urban population and the democracy index are associated with decreases in dietary energy supply.

Prais-Winsten regression equations for our second measure of food availability, dietary protein supply, are reported in Table 4. Similar to the results for dietary energy supply, we find support for H_1. Specifically, increases in social spending (Model 1: $b = 0.0008$, $p < 0.001$; Model 4: $b = 0.001$, $p < 0.001$) and health spending (Model 2: $b = 0.0008$, $p < 0.001$; Model 5: $b = 0.001$, $p < 0.001$) are associated with increases in dietary protein supply. The effect of top 10% income share is not consistent across models, again contradicting H_3. Control variables are, again, related to food insecurity in a predictable fashion. That is, increases in GDP per capita, food imports and the age dependency ratio are positively related to dietary protein

supply, while increases in urban population and unemployed are negatively associated with dietary protein supply.

Table 3. Prais-Winsten Regression Coefficients (*b*) and Standard Errors (SE) for Determinants of Dietary Energy Supply, 2000–2017.

	Model 1	Model 3	Model 3	Model 4	Model 5	Model 6
	b	***b***	***b***	***b***	***b***	***b***
	SE	**SE**	**SE**	**SE**	**SE**	**SE**
Social spending per capita	0.001 ***			0.0005 ***		
	(0.0001)			(0.00007)		
Health spending per capita (ln)		5.51 ***			2.43 ***	
		(0.39)			(0.29)	
Top 10% income share (ln)	8.77 ***	10.13 ***	7.91 ***			
	(1.67)	(1.77)	(1.66)			
GDP per capita (ln)			7.37 ***			5.27 ***
			(0.77)			(0.48)
Military expenditure (ln)	−0.19	0.23	0.91 **	2.65 ***	2.22 ***	2.62 ***
	(0.57)	(0.37)	(0.28)	(0.47)	(0.40)	(0.40)
Total population (ln)	1.95 ***	1.05 ***	1.40 ***	1.42 ***	1.22 ***	1.49 ***
	(0.32)	(0.27)	(0.20)	(0.21)	(0.22)	(0.23)
Population growth	0.84 *	1.02 **	0.52 #	0.65 **	0.53 **	0.44 **
	(0.34)	(0.36)	(0.28)	(0.21)	(0.17)	(0.16)
Urban population	−0.32 ***	−0.27 ***	−0.32 ***	−0.18 ***	−0.14 ***	−0.21 ***
	(0.02)	(0.02)	(0.02)	(0.04)	(0.04)	(0.04)
Food imports (ln)	2.55 ***	2.12 ***	2.40 ***			
	(0.47)	(0.60)	(0.61)			
Age dependency ratio	0.40 ***	0.48 ***	0.37 **	0.37 ***	0.29 ***	0.30 ***
	(0.10)	(0.11)	(0.11)	(0.07)	(0.06)	(0.06)
Unemployed (ln)	−1.82 ***	−0.73	0.20	−1.01 **	−0.54 *	0.11
	(0.40)	(0.46)	(0.32)	(0.29)	(0.25)	(0.24)
Democracy (sq.)	−0.003 ***	−0.001 ***	−0.001 ***			
	(0.0002)	(0.0002)	(0.0002)			
Constant	116.31 ***	89.11 ***	52.45 ***	102.00 ***	91.23 ***	54.22 ***
	(8.79)	(9.52)	(11.48)	(5.17)	(4.96)	(6.23)
R^2	0.98	0.98	0.99	0.98	0.98	0.98
Wald χ^2	11,316 ***	14,425 ***	17,280 ***	209 ***	236 ***	369 ***
N	310	310	310	539	600	600

Note: *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, # $p < 0.10$ (two-tailed).

Table 4. Prais-Winsten Regression Coefficients (*b*) and Standard Errors (SE) for Determinants of Dietary Protein Supply, 2000–2012.

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
	b	***b***	***b***	***b***	***b***	***b***
	SE	**SE**	**SE**	**SE**	**SE**	**SE**
Social spending per capita	0.0008 ***			0.001 ***		
	(0.0001)			(0.0001)		
Health spending per capita (ln)		4.59 ***			6.18 ***	
		(0.83)			(0.62)	
Top 10% income share (ln)	2.88 #	3.61 #	4.19 #			
	(1.73)	(1.80)	(2.48)			
GDP per capita (ln)			9.56 ***			10.82 ***
			(1.38)			(0.70)
Military expenditure (ln)	0.20	0.95	2.40 **	4.40 ***	4.99 ***	5.68 ***
	(0.82)	(0.83)	(0.78)	(0.80)	(0.79)	(0.65)

Table 4. *Cont.*

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
	b	***b***	***b***	***b***	***b***	***b***
	SE	**SE**	**SE**	**SE**	**SE**	**SE**
Total population (ln)	1.15 *	0.40	0.42	−0.10	−0.68	−0.22
	(0.58)	(0.55)	(0.50)	(0.43)	(0.44)	(0.37)
Population growth	0.39 #	0.50 **	0.22	0.53 *	0.67 *	0.46 #
	(0.20)	(0.18)	(0.17)	(0.26)	(0.30)	(0.27)
Urban population	−0.18 ***	−0.15 ***	−0.25 ***	−0.13 *	−0.15 **	−0.27 ***
	(0.03)	(0.03)	(0.05)	(0.05)	(0.06)	(0.06)
Food imports (ln)	3.11 ***	2.87 ***	3.46 ***	1.65 **	2.00 **	2.95 ***
	(0.57)	(0.70)	(0.71)	(0.52)	(0.60)	(0.54)
Age dependency ratio	0.44	0.46 ***	0.36 ***	0.30 ***	0.44 ***	0.39 ***
	(0.07)	(0.08)	(0.07)	(0.07)	(0.10)	(0.08)
Unemployed (ln)	−1.92 ***	−1.14 **	0.20	−1.90 ***	−1.18 **	0.42
	(0.28)	(0.42)	(0.48)	(0.34)	(0.45)	(0.36)
Democracy (sq.)	0.0006 *	0.0005	−0.00002			
	(0.0003)	(0.0004)	(0.0004)			
Constant	65.08 ***	46.05 ***	−5.63	89.77 ***	53.51 ***	−13.39
	(9.52)	(10.00)	(12.89)	(6.10)	(8.64)	(10.73)
R^2	0.97	0.97	0.97	0.96	0.96	0.97
Wald χ^2	661 ***	1346 ***	890 ***	173 ***	251 ***	834 ***
N	310	310	310	425	425	425

Note: *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, # $p < 0.10$ (two-tailed).

Finally, Table 5 reports six OLS regression equations predicting moderate and severe food insecurity. Increases in social spending (Model 1: $b = -0.00006$, $p < 0.01$; Model 4: $b = -0.0001$, $p < 0.001$) and health spending (Model 2: $b = -0.54$, $p < 0.05$; Model 5: $b = -0.59$, $p < 0.05$) are associated with decreases in moderate and severe food insecurity—or, in other words, an increase in food accessibility. These results suggest that welfare state spending reduces the prevalence of moderate and severe food insecurity in OECD countries, which supports H_2. Top 10% income share, however, is not associated with food insecurity, again contradicting H_4.

Also, interesting is the finding regarding food availability on food accessibility. Dietary energy supply is *positively* related to moderate and severe food insecurity in all of the models, suggesting that increasing food availability does not necessarily increase food accessibility. This finding suggests that policies to address food insecurity in OECD countries should focus on food accessibility. Given that food availability is not an issue in most OECD countries this finding may not be surprising, even while it is notable. Providing additional food to countries that already have an abundant level of food is not likely to decrease food insecurity because people already struggle to access existing food supplies. As was previously discovered, the control variables were largely related to food insecurity as predicted in other studies. That is, increases in unemployed are associated with increases in food insecurity, while increases in GDP per capita area associated with decreases in food insecurity.

Table 5. OLS Regression models of moderate or severe food insecurity across OECD countries (2015–2018) with robust standard error adjusted for within country clustering.

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
	b	*b*	*b*	*b*	*b*	*b*
	Robust SE	Robust SE	Robust SE	Robust SE	Robust SE	Robust SE
Social spending per capita	−0.00006 **			−0.0001 ***		
	0.00002			0.00001		
Health spending per capita (ln)		−0.54 *			−0.59 *	
		0.23			0.24	
Top 10% income share (ln)	0.47	0.45	0.52			
	0.35	0.51	0.33			
GDP per capita (ln)			−0.52 **			−0.73 ***
			0.15			0.15
Military expenditure (ln)	−0.14	−0.002	−0.09	−0.12	0.04	−0.07
	0.16	0.15	0.14	0.16	0.15	0.13
Total population (ln)	−0.09 *	−0.02	−0.07 *	−0.07	0.01	−0.04
	0.04	0.05	0.04	0.04	0.05	0.04
Population growth				0.15	0.15 *	0.24 *
				0.1	0.11	0.09
Urban population	0.01 #	0.01	0.01 #	0.01	0.004	0.01
	0.01	0.01	0.01	0.01	0.01	0.01
Age dependency ratio	0.01	0.01	0.01	0.01	0.01	0.01
	0.01	0.01	0.01	0.01	0.01	0.01
Unemployed (ln)	0.44 ***	0.29 *	0.35 **	0.50 ***	0.33 **	0.41 **
	0.01	0.11	0.1	0.11	0.11	0.11
Democracy (sq.)	−0.0001		−0.0001	−0.0001	−0.00003	−0.00003
	0.0001		0.0001	0.0001	0.0001	0.0001
Dietary energy supply	0.01 *	0.01 *	0.02 **	0.01 *	0.01 *	0.02 **
	0.01	0.01	0.01	0.01	0.01	0.004
Year	0.01	0.01	−0.003	0.02	0.01	0.01
	0.02	0.02	0.02	0.02	0.03	0.02
Constant	−28.14	−11.19	12.09	−44.71	−20.55	−13.92
R^2	0.63	0.57	0.61	0.64	0.59	0.66
F	10.57 ***	10.71 ***	10.33 ***	8.40 ***	6.33 ***	10.68 ***
N	132	134	134	132	134	134

Note: *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, # $p < 0.10$ (two-tailed).

4. Discussion

This research builds on trends in cross-national food insecurity research to investigate the impact of welfare spending and income inequality on food availability (measured by the FAO's Dietary Energy Supply and Dietary Protein Supply indicators) and food accessibility (measured by the FIES) in affluent countries. This research suggests that welfare spending matters. That is, state spending on health and social care may decrease food insecurity by increasing food availability and access to food. This finding conformed to hypotheses H_1 and H_3. In particular, welfare expenditures appear to increase food availability through dietary energy and protein supplies in OECD countries. This finding is consistent with research in low-income countries that consider the potential role of welfare on lowering food prices e.g., [56]. Moreover, welfare expenditures appear to increase access to food as measured by the FIES. In short, we found that increasing social and public health expenditures are associated with decreasing moderate and severe food insecurity within and across nations.

When it comes to income inequality, we discover that income inequality is not related to food access as measured through FIES but is associated with *greater* levels of food supplies. These findings contradict our hypotheses (H_2 and H_4) and cast serious questions about welfare policies that serve to address food security by promoting food surpluses in OECD countries. While this may be the first research to report this association in advanced

capitalist nations, the finding, though unexpected, is not completely surprising. Research by Smith et al. [57], for instance, suggests that low income countries with the most poverty and highest food insecurity are also the same countries with large food surpluses. In the current study, all OECD countries have food surpluses. And, importantly, when the level of dietary energy supply is used to predict food availability, there is an inverse relationship between food surpluses and food availability. That is, having greater food supplies simply does not matter (or perhaps even makes it worse) when it comes to food insecurity in OECD countries. Increasing food availability therefore does little to change the status quo because surplus food is not distributed to everyone in the population.

One limitation of this study is that the number of observations for the moderate or severe food insecurity model was too low to conduct longitudinal analyses. Despite the fact that we adjusted for within-cluster dependence, the model is not robust against unobserved heterogeneity, the solution of which requires longitudinal modeling with a large number of observations. We, therefore, recommend future research conduct longitudinal analyses on moderate or severe food insecurity when data becomes available for future years. A second limitation of the analyses is that some of the key independent variables (e.g., social spending, health spending and GDP per capita) exhibited high multicollinearity, prohibiting testing these variables in the same models. Future research should test alternative measures of these concepts.

Our findings regarding welfare policies on dietary energy (and protein) supply have important social justice implications. In particular, welfare policies appear to generate excessive food supplies, beyond what is necessary to feed each country's population. Moreover, economic policies that concentrate wealth in a small percentage of the population also appears to concentrate national food supplies. The fact that OECD countries have excess food is counterproductive to overall global health. That is, while reductions in OECD food supplies should have minimal impacts on food security in OECD countries a potential increase in food supplies in low income countries could lead to important gains in health outcomes by increasing food security [58]. As a result, OECD countries that seek to promote global health should not only focus their efforts on poverty reduction polices that increase welfare to promote better access to food and reduce economic inequality to prevent excessive food supplies, but must simultaneously ensure a more equitable global distribution of food supplies.

Author Contributions: Conceptualization, M.B.H., M.A.L., P.B.S.; Methodology, M.B.H., M.A.L., P.B.S.; Formal Analysis; Investigation, M.B.H., M.A.L., P.B.S.; Data Curation, M.B.H., M.A.L.; Writing—Original Draft Preparation, M.B.H., M.L.; Writing—Review & Editing, M.B.H., M.A.L., P.B.S. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: Not Applicable.

Informed Consent Statement: Not Applicable.

Data Availability Statement: Data available in a publicly accessible repository that does not issue DOIs. Publicly available datasets were analyzed in this study. This data can be found in these locations: www.worldbank.org, www.fao.org/faostat/ed/#data/FS, www.oecd.org/, wid.world/, freedomhouse.org/expanding-freedom-and-democracy.

Conflicts of Interest: The authors declare no conflict of interest.

References

1. Barrett, C.B.; Lentz, E.C. Food Insecurity. In *Oxford Research Encyclopedia of International Studies*; Oxford University Press: Oxford, UK, 2010.
2. Long, M.A.; Gonçalves, L.; Stretesky, P.B.; Defeyter, M.A. Food Insecurity in Advanced Capitalist Nations: A Review. *Sustainability* **2020**, *12*, 3654. [CrossRef]
3. Jenkins, J.C.; Scanlan, S.J.; Peterson, L. Military Famine, Human Rights, and Child Hunger. *J. Confl. Resolut.* **2007**, *51*, 823–847. [CrossRef]
4. Richards, C.; Kjærnes, U.; Vik, J. Food Security in Welfare Capitalism: Comparing Social Entitlements to Food in Australia and Norway. *J. Rural Stud.* **2016**, *43*, 61–70. [CrossRef]

5. FAO, W. *The State of Food Security and Nutrition in the World 2019: Safeguarding against Economic Slowdowns and Downturns*; FAO: Rome, Italy, 2019.
6. Rudra, N. Globalization and the Decline of the Welfare State in Less-Developed Countries. *Int. Organ.* **2002**, *56*, 411–445. [CrossRef]
7. Middleton, G.; Mehta, K.; McNaughton, D.; Booth, S. The Experiences and Perceptions of Food Banks amongst Users in High-Income Countries: An International Scoping Review. *Appetite* **2018**, *120*, 698–708. [CrossRef]
8. Riches, G. Hunger and the Welfare State: Comparative Perspectives. In *First World Hunger*; Springer: Berlin, Germany, 1997; pp. 1–13.
9. Ejebu, O.-Z.; Whybrow, S.; Mckenzie, L.; Dowler, E.; Garcia, A.L.; Ludbrook, A.; Barton, K.L.; Wrieden, W.L.; Douglas, F. What Can Secondary Data Tell Us about Household Food Insecurity in a High-Income Country Context? *Int. J. Environ. Res. Public Health* **2019**, *16*, 82. [CrossRef]
10. Henjum, S.; Morseth, M.S.; Arnold, C.D.; Mauno, D.; Terragni, L. "I Worry If I Will Have Food Tomorrow": A Study on Food Insecurity among Asylum Seekers Living in Norway. *BMC Public Health* **2019**, *19*, 592. [CrossRef]
11. Mook, L.; Murdock, A.; Gundersen, C. Food Banking and Food Insecurity in High-Income Countries. *VOLUNTAS Int. J. Volunt. Nonprofit Organ.* **2020**, *31*, 833–840. [CrossRef]
12. Tarasuk, V.; Eakin, J.M. Charitable Food Assistance as Symbolic Gesture: An Ethnographic Study of Food Banks in Ontario. *Soc. Sci. Med.* **2003**, *56*, 1505–1515. [CrossRef]
13. Sen, A. *Economics and Entitlements*; WIDER Working Papers; UNU-WIDER: Helsinki, Finland, 1986.
14. Scanlan, S.J. Food Availability and Access in Lesser-Industrialized Societies: A Test and Interpretation of Neo-Malthusian and Technoecological Theories. In *Sociological Forum*; Springer: Berlin, Germany, 2001; Volume 16, pp. 231–262.
15. Scanlan, S.J. Food Security and Comparative Sociology: Research, Theories, and Concepts. *Int. J. Sociol.* **2003**, *33*, 88–111. [CrossRef]
16. Scanlan, S.J. Women, Food Security, and Development in Less-Industrialized Societies: Contributions and Challenges for the New Century. *World Dev.* **2004**, *32*, 1807–1829. [CrossRef]
17. Bhandari, A.; Burroway, R. Hungry for Equality: A Longitudinal Analysis of Women's Legal Rights and Food Security in Developing Countries. *Sociol. Q.* **2018**, *59*, 424–448. [CrossRef]
18. Loopstra, R.; Reeves, A.; McKee, M.; Stuckler, D. Food Insecurity and Social Protection in Europe: Quasi-Natural Experiment of Europe's Great Recessions 2004–2012. *Prev. Med.* **2016**, *89*, 44–50. [CrossRef] [PubMed]
19. Reeves, A.; Loopstra, R.; Stuckler, D. The Growing Disconnect between Food Prices and Wages in Europe: Cross-National Analysis of Food Deprivation and Welfare Regimes in Twenty-One EU Countries, 2004–2012. *Public Health Nutr.* **2017**, *20*, 1414–1422. [CrossRef] [PubMed]
20. Pinstrup-Andersen, P. Food Security: Definition and Measurement. *Food Secur.* **2009**, *1*, 5–7. [CrossRef]
21. FAO. *The State of Food Insecurity in the World 2015. Meeting the 2015 International Hunger Targets: Taking Stock of Uneven Progress [Internet]*; Food and Agriculture Organization of the United Nations, International Fund for Agricultural Development: Rome, Italy, 2015.
22. Ashby, S.; Kleve, S.; McKechnie, R.; Palermo, C. Measurement of the Dimensions of Food Insecurity in Developed Countries: A Systematic Literature Review. *Public Health Nutr.* **2016**, *19*, 2887–2896. [CrossRef]
23. Climate Change, Agriculture and Food Security. In *The State of Food and Agriculture*; FAO (Ed.) FAO: Rome, Italy, 2016.
24. Del Gobbo, L.C.; Khatibzadeh, S.; Imamura, F.; Micha, R.; Shi, P.; Smith, M.; Myers, S.S.; Mozaffarian, D. Assessing Global Dietary Habits: A Comparison of National Estimates from the FAO and the Global Dietary Database. *Am. J. Clin. Nutr.* **2015**, *101*, 1038–1046. [CrossRef]
25. How Does International Price Volatility Affect Domestic Economies and Food Security? In *The State of Food Insecurity in the World*; FAO, Ed.; FAO: Rome, Italy, 2011.
26. Cafiero, C.; Gennari, P. The FAO Indicator of the Prevalence of Undernourishment. In *Workshop on Measuring Food Insecurity*; The National Academies: Washington, DC, USA, 2011.
27. Ballard, T.J.; Kepple, A.W.; Cafiero, C. *The Food Insecurity Experience Scale: Development of a Global Standard for Monitoring Hunger Worldwide*; FAO: Rome, Italy, 2013.
28. Cafiero, C.; Viviani, S.; Nord, M. Food Security Measurement in a Global Context: The Food Insecurity Experience Scale. *Measurement* **2018**, *116*, 146–152. [CrossRef]
29. Riches, G.; Silvasti, T. Hunger in the Rich World: Food Aid and Right to Food Perspectives. In *First World Hunger Revisited*; Springer: Berlin, Germany, 2014; pp. 1–14.
30. Scanlan, S.J. Guns, Butter, and Development: Security and Military Famine Extensions of the Modernization versus Dependency Debate. *J. Political Mil. Sociol.* **2001**, *29*, 331.
31. Kick, E.L.; McKinney, L.A.; Thompson, G.H. Intensity of Food Deprivation: The Integrative Impacts of the World System, Modernization, Conflict, Militarization and the Environment. *Int. J. Comp. Sociol.* **2011**, *52*, 478–502. [CrossRef]
32. Austin, K.F.; McKinney, L.A.; Thompson, G. Agricultural Trade Dependency and the Threat of Starvation. *Int. J. Sociol.* **2012**, *42*, 68–89. [CrossRef]
33. Mihalache-O'keef, A.; Li, Q. Modernization vs. Dependency Revisited: Effects of Foreign Direct Investment on Food Security in Less Developed Countries. *Int. Stud. Q.* **2011**, *55*, 71–93. [CrossRef]

34. Jenkins, J.C.; Scanlan, S.J. Food Security in Less Developed Countries, 1970 to 1990. *Am. Sociol. Rev.* **2001**, *66*, 718–744. [CrossRef]
35. Loopstra, R.; Reeves, A.; Tarasuk, V. The Rise of Hunger among Low-Income Households: An Analysis of the Risks of Food Insecurity between 2004 and 2016 in a Population-Based Study of UK Adults. *J. Epidemiol. Community Health* **2019**, *73*, 668–673. [CrossRef] [PubMed]
36. Brady, D.; Fullerton, A.S.; Cross, J.M. Putting Poverty in Political Context: A Multi-Level Analysis of Adult Poverty across 18 Affluent Democracies. *Soc. Forces* **2009**, *88*, 271–299. [CrossRef]
37. Esping-Andersen, G. *Welfare States in Transition: National Adaptations in Global Economies*; SAGE: Thousand Oaks, CA, USA, 1996.
38. Hong, P.Y.P. A Cross-National Comparison of Welfare Effort during an Age of Welfare State Retrenchment. *J. Comp. Soc. Welf.* **2006**, *22*, 125–142. [CrossRef]
39. Harvey, D. *A Brief History of Neoliberalism*; Oxford University Press: New York, NY, USA, 2007.
40. Springer, S.; Birch, K.; MacLeavy, J. *Handbook of Neoliberalism*; Routledge: Abingdon, UK, 2016.
41. Brooks, C.; Manza, J. Why Do Welfare States Persist? *J. Politics* **2006**, *68*, 816–827. [CrossRef]
42. Kenworthy, L. Do Social-Welfare Policies Reduce Poverty? A Cross-National Assessment. *Soc. Forces* **1999**, *77*, 1119–1139. [CrossRef]
43. Moller, S.; Huber, E.; Stephens, J.D.; Bradley, D.; Nielsen, F. Determinants of Relative Poverty in Advanced Capitalist Democracies. *Am. Sociol. Rev.* **2003**, *68*, 22–51. [CrossRef]
44. Brady, D. The Welfare State and Relative Poverty in Rich Western Democracies, 1967–1997. *Soc. Forces* **2005**, *83*, 1329–1364. [CrossRef]
45. Wade, R.H. Is Globalization Reducing Poverty and Inequality? *Int. J. Health Serv.* **2004**, *34*, 381–414. [CrossRef] [PubMed]
46. Piketty, T. *Capital in the Twenty-First Century*; Harvard University Press: Cambridge, MA, USA, 2014.
47. Garfinkel, I.; Rainwater, L.; Smeeding, T.M. A Re-Examination of Welfare States and Inequality in Rich Nations: How in-Kind Transfers and Indirect Taxes Change the Story. *J. Policy Anal. Manag.* **2006**, *25*, 897–919. [CrossRef]
48. OECD. Available online: https://www.oecd.org/ (accessed on 1 May 2020).
49. World Income Database. Available online: https://wid.world/ (accessed on 1 March 2020).
50. Jorgenson, A.; Schor, J.; Huang, X. Income Inequality and Carbon Emissions in the United States: A State- level Analysis, 1997–2012. *Ecol. Econom.* **2017**, *134*, 40–48. [CrossRef]
51. The World Bank. Available online: https://www.worldbank.org/ (accessed on 1 March 2020).
52. Freedom House. Available online: https://freedomhouse.org/expanding-freedom-and-democracy (accessed on 1 March 2020).
53. Beck, N.; Katz, J.N. What to Do (and Not to Do) with Time-Series Cross-Section Data. *Am. Political Sci. Rev.* **1995**, *89*, 634–647. [CrossRef]
54. York, R. Demographic Trends and Energy Consumption in European Union Nations, 1960–2025. *Soc. Sci. Res.* **2007**, *36*, 855–872. [CrossRef]
55. Maddala, G.S.; Lahiri, K. *Introduction to Econometrics*; Macmillan New York: New York, NY, USA, 1992; Volume 2.
56. Anríquez, G.; Daidone, S.; Mane, E. Rising Food Prices and Undernourishment: A Cross-Country Inquiry. *Food Policy* **2013**, *38*, 190–202. [CrossRef]
57. Smith, L.C.; El Obeid, A.E.; Jensen, H.H. The Geography and Causes of Food Insecurity in Developing Countries. *Agric. Econom.* **2000**, *22*, 199–215. [CrossRef]
58. Müller, O.; Krawinkel, M. Malnutrition and Health in Developing Countries. *CMAJ* **2005**, *173*, 279–286. [CrossRef]