

## **Economic Conditions and European Concerns about Food Production Sufficiency**

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### **Abstract**

The Great Recession had uneven effects on members of the European Union. Some countries experienced increased food insecurity. Through statistical analyses of data from the Eurobarometer 77.2 survey (N=26,593 from 27 countries), this study identifies and explains differences between Europeans' concerns about food production sufficiency, one aspect of food security. European respondents experiencing financial hardship or living in countries struggling to recover from the Great Recession, with higher unemployment and social exclusion rates, were more likely to be concerned about food sufficiency in their own countries. Their egoistic concerns about food production were linked to personal or local struggles to meet basic human needs. Altruistic concerns about food production sufficiency in the world were found in residents of countries removed from such economic struggles. By understanding why some Europeans were more concerned about global vs. local food security, policy makers will be better able to acquire support for relevant changes in food and agricultural policies. This research connects country-level economic conditions to individual concerns about an important social issue.

## Introduction

Food production should be a concern for everyone. Everyone needs to eat. However, today's food supply is more than what is needed to feed the world's population (Runge et al., 2003 p.14). Even though hunger exists, many are more concerned about the growing obesity problem, especially in developing countries adopting a more unhealthy Western diet (Popkin, 2007 p.88).

The Great Recession, which began in 2007 with a financial collapse that erased capital and resulted in historical job losses (Grusky, Western and Wimer 2011), might have changed that focus. Economic crises, much like environmental disasters, have uneven geographical consequences. In the European Union (EU), concern about food sufficiency within one's own nation, the European Union (EU) or the world, varied depending on one's country and if one had experienced recent financial difficulties (European Commission, 2012b). Considering that Greeks, Spaniards, Italians and Latvians were more likely to have witnessed the negative effects of the recession, if not in their own households, through their friends, relatives and local news stories, it should not be a surprise that they were more acutely aware of local problems of poverty and hunger. Applying Maslow's theory about the hierarchy of needs (1954), personal or local awareness of a problem obscures one's concern about global issues, since one is more focused on meeting one's basic needs and has little time or energy to spend on worrying about the globalized other. Egoistic concerns about a problem undermine altruistic interests (Stern et al., 1993; Stern et al. 1995; Mohai and Bryant, 1998; Schultz, 2001; Snelgar, 2006).

This research is an attempt to test whether country-level factors, such as changes in the gross domestic product per capita (GDP/capita PPS), a country's unemployment rate and the proportion of people experiencing social exclusion, influence individual concern about food production sufficiency within in one's own country, the EU or the world. Understanding how concerns differ and which individual and country-level factors impact those concerns provides valuable information to policy-makers considering which food and agricultural policies to promote.

## Review of the Literature

Concern about sufficient food production is one aspect of concern about food security or food *insecurity*, and is compounded by the difficulty in defining what food security is. The World Health Organization's (WHO) World Food Summit in 1996 defined food security as the condition "when all people at all times have access to sufficient, safe, nutritious food to maintain a healthy and active life" (WHO, 2014). This definition differs slightly from the United States Department of Agriculture's classification:

Access by all people at all times to enough food for an active, healthy life. Food security includes at a minimum: (1) the ready availability of nutritionally adequate and safe foods, and (2) an assured ability to acquire acceptable foods in socially acceptable ways (e.g., without resorting to emergency food supplies, scavenging, stealing, or other coping strategies) (Bickel et al., 2000 p.6).

Meanwhile, the European Commission focus is on food and nutrition security with policies that are aimed at "...ensuring that everybody is able to access sufficient, affordable and nutritious food (European Commission, 2013b). Most Europeans have not had to be concerned about their *own* food security since the end of World War II. In fact, the issue of food security is discussed in terms of aid to developing countries under "Development and Cooperation—EUROPEAID" on the European Commission website (European Commission, 2013b). It is not a concern within the realm of food and agricultural policy *for Europeans*.

Another challenge to being concerned about food security is the difficulty in understanding it. Food security is a multidimensional issue. Not only can food insecurity manifest through insufficient production and availability of food, but access to food, stability in food supplies and how food is utilized can affect it, as well (Gibson, 2012 p. 8). Also, there are different levels of food insecurity. Food insecurity can be at risk at the individual, household, national and regional or global levels. Various factors can contribute to food insecurity at these different levels, including demographic, political, economic, environmental, social and cultural conditions and other risks, hazards and shocks (Gibson, 2012 p.10). Finally, food security/insecurity has a time dimension to it. Food security can be chronic, temporary or transitional, or cyclical or seasonal (Gibson, 2012 p.11). Therefore, it is not surprising that people's concerns about food security vary, since understanding the issue is quite complex.

Little is known about what influences people's *concern* about food security, let alone one specific aspect of food security, sufficient food production. Few academic studies have been published about why some people are more concerned about food security for themselves, those around them or within a larger, global context. One study conducted for Tyson Foods and the Food Research and Action Center (a nonprofit organization with ties to Nestle` Foods as well as other diverse interests) found that 45% of adults polled in the U.S. believed that hunger was a serious problem in their country. Women,

lower income respondents, as well as those without college educations and those from urban areas were more likely to view hunger as a serious problem. But hunger was more likely to be viewed as a national problem and less likely a problem in one's own state or community (Hart Research and Chesapeake Bay Consulting, 2014 pp.1-2).

Similar questions were asked on the Eurobarometer 77.2, which was a comprehensive survey aimed at examining European *attitudes* about sufficient food production. A report prepared for the European Commission (2012b) provided basic descriptive results from the survey and showed patterns between a respondent's nationality, age and whether or not they had difficulties paying their bills and their concern about sufficient food production in their own country. Most Europeans in all countries were concerned about *global* food production, and in general, most Europeans were *not* concerned about food production in their *own country*. "In 17 out of 27 Member States the proportion of respondents who are *not* concerned about food production in their *own country* is greater than the proportion of those who are concerned" (European Commission, 2012b p.7). However, there were large differences between countries, with 94% of respondents from Greece expressing concern about food sufficiency in their own country, compared to only 11% of respondents from Denmark. Younger respondents and those who reported having "difficulties paying their bills most of the time" were more likely to express a concern about sufficient food production in their own countries. There was little difference between age groups or those struggling financially in terms of their attitudes about global food production (European Commission, 2012b p.11). It must be noted, however, that statistical significance and inferential analyses of all of these differences were not reported.

The disparities in European concerns about sufficient food production are conceivably tied to the recent Great Recession. The loss of capital and jobs did not affect all European countries equally. Therefore, awareness of localized poverty and hunger is most likely unevenly distributed. While most Northern European countries have experienced at least some economic recovery since the recession, Eastern European countries, along with Portugal, Ireland, Italy, Greece and Spain have struggled with double-digit unemployment and lower incomes (Eurostat, 2014). Many countries have had to cut government spending on health and social programs under austerity measures taken to control national debts (Karger, 2014). Governments in the struggling countries have slashed public service jobs, suspended pensions and raised value-added taxes on food, in order to make budget targets set by the European Commission. In Spain, for example, school lunch programs were cut, and charities were left in charge of feeding over 65,000 hungry Spaniards (Daley, 2012). A *New York Times* article (Alderman, 2013) reported that Greek teachers were concerned that children were coming to school hungry and picking through the trash for food. The Athens city government and the Greek Orthodox Archdiocese of Athens served 600-1,000 people a day at a large soup kitchen, and the city was supporting over 20,000 people a day with groceries and other meals (Hartocollis, 2015). As European countries struggle to recover from the Great Recession, the European Red Cross has focused more attention on distributing food to European food banks to help alleviate hunger amongst those who have been chronically unemployed. In a 2013 report, the Red Cross blamed the continued economic crisis for the 43 million Europeans who were experiencing hunger daily (McDonald-Gibson, 2013).

These reports provide illustrations of the food insecurity, mostly access to sufficient food, in many countries in Europe, but there is little academic research on the phenomenon. One study analyzing Eurostat data (Loopstra, Reeves and Stuckler, 2015) found an 8.7% increase in the proportion of Europeans unable to afford meat or an equivalent in 2009 and a 10.9% increase in 2012. They also found that 13.5 million Europeans were living with food insecurity, but could only suggest that high unemployment, debt, housing costs and increased wealth inequality were factors contributing to this problem, since there were not obvious direct correlations (Loopstra et al., 2015). A study of food pantry use in New York State found that long term unemployment was strongly correlated with increased use of food pantries (Shackman et al., 2015), so that is likely the case in the EU, as well.

Meanwhile, the fragile economic progress that had been made as Central European countries were integrating into the European Union was disrupted by the recession. The foreign direct investments driving export production in countries like Poland, Hungary, Slovakia and others that had increased wages and productivity were halted during the downturn (Galgoczi, 2013). Although these economies have rebounded somewhat, they are no longer at the same competitive advantage over other European countries in terms of wage costs (Galgoczi, 2013). Unemployment rates remained high for countries like Slovakia and Romania and only recently showed signs of improvement in other countries like Hungary and Poland (World Bank 2014). At the same time, many Eastern European leaders focused on austerity measures to address high rates of public debt. For example, Valdis Dombrovskis, Latvia's prime minister in 2009, proposed cutting public-sector pay by 20 percent more, on top of the 15 percent reduction that had occurred previously (Land, 2009 p.172). High unemployment and austerity measures are two of the many factors associated with poor material conditions of many citizens in Central European countries. "In 2013, more than a third of the population was at risk of poverty or social exclusion in five EU Member States: Bulgaria (48.0 %), Romania (40.4 %), Greece (35.7 %), Latvia (35.1 %) and Hungary (33.5 %) (Eurostat, 2015a).

One conclusion from the Eurobarometer 77.2 is that attitudes about one aspect of food security, sufficient food production, are affected by one's "consciousness of their own economic security" (European Commission, 2012a p.11).

Because the recovery from the Great Recession has been geographically uneven within Europe, it is likely that more citizens within those countries struggling with higher unemployment and social exclusion would more likely express concern about sufficient food production in their own countries. Based upon Maslow's theory (1954) of a hierarchy of needs, those more aware of and focused on their own or their fellow country mates' basic needs will be less concerned about the global other. Since their basic physiological needs are not being met, they are unable to focus on more philosophical concerns or self-actualization (Maslow, 1954).

Although the differences in concern about sufficient food production have not been studied. Others have studied differences in concern about other social and political issues. For example, researchers have tested whether environmental concerns can be classified into three categories: Egoistic, altruistic and biospheric. Most results show that attitudes about the environment fall within at least two categories, egoistic values, in which individuals are concerned about how environmental changes affect their own lives, and a combined category of altruistic and biospheric attitudes, in which people's concerns transcend their personal lives, and focus on the effects of environmental problems on others and the world in general (Stern et al., 1993; Stern et al., 1995; Schultz, 2001; Snelgar, 2006). Most of this research focuses on how these differences in concern reflect differences in individuals' values, but these differences might also be connected to the theory of a hierarchy of needs (Maslow, 1954). For example, one explanation for why African Americans are more likely to express concern about environmental problems within their own neighborhoods is that they are more likely to be poor and be environmentally deprived (Mahoi and Bryant, 1998). Not surprisingly, urban transient women have been found to be more concerned about meeting daily, physical needs related to food, health and safety, less concerned about feeling like they belonged or were accepted by others, without mentioning concerns about aesthetic or self-actualization needs (Coston, 1993).

Whether or not a person's basic needs (food and shelter) are met is not only dependent upon one's personal circumstances, but the society in which one lives (Tay and Diener, 2011). Therefore, it is likely that those who are experiencing a problem first-hand and those living in countries where more people are struggling to meet their basic needs will be less concerned about how the problem affects others globally, and more concerned about the immediate troubles. Increases in unemployment rates and decreases in GDP increased economic deprivation (Visser, Gesthuizen & Scheepers, 2014), so people experiencing such deprivation are likely to be concerned about sufficient food production closest to home, and less concerned about the world.

In order to monitor and address poverty in the EU, Eurostat tracks the rates of those at risk for poverty and social exclusion (AROPE) which "refers to the situation of people either at risk of poverty, or severely materially deprived or living in a household with a very low work intensity" (Eurostat 2015a). This measure allows for distributional as well as relational issues to be recognized, and it shifts the focus away from the "victims" of economic circumstances and more toward the processes that cause isolation and low labor force participation (Madanipour, Shucksmith and Talbot, 2015). However, because the patterns of people at risk for poverty and social exclusion are spatially uneven in Europe, concerns and policy responses tend to be localized (Madanipour et al., 2015).

Therefore, the following research questions were explored: "Are respondents from those European countries plagued by the Great Recession, with higher unemployment and social exclusion rates and struggling economies, more likely than others to be concerned about one aspect of food security, sufficient food production, in their own country and less likely to be concerned about sufficient global food production? Also, which other factors determine the likelihood of a respondent's concern about more local or regional versus global food sufficiency?" Based upon previous research (Hart Research and Chesapeake Bay Consulting 2014, European Commission 2012b), respondents who were female, lower in social status, with less education, living in rural areas and those experiencing recent financial difficulty should have expressed more concern about food sufficiency in their own country and Europe than the world. Respondents from countries hardest hit by the Great Recession should have been more concerned about food insufficiency in their own country or the European Union than global food sufficiency. Respondents living in countries with lower increases (or higher decreases) in GDP/capita PPS, higher unemployment rates and higher social exclusion rates should have been more likely to express concern about food production sufficiency in their own country and Europe than in the world.

## Data and Methods

Data for this research came from the Eurobarometer 77.2 survey (European Commission, 2013b) collected in March, 2012. Since 1973, the Eurobarometer has been conducted through face-to-face interviews of a probability sample of approximately 1,000 respondents from each country within the European Union. The survey gauges opinions on numerous current events and political and social issues. Reports are published twice yearly (European Commission, 2012a). The Eurobarometer 77.2 included respondents from 27 countries (N=26,593), including Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Great Britain, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain and Sweden, with

separate samples from East Germany and Northern Ireland. The Eurobarometer is a reputable source of valid and reliable measures of European attitudes (Jolly, 2007). However, questions are asked in respondents' native languages, which make interpretations dependent on translations and could introduce bias. Nevertheless, the data are highly scrutinized by researchers, and the methodology is documented for each study (Jolly, 2007, p. 147).

The data were weighted according to each national sample's proportional share of the total population of the EU27 countries using the weight adjustment variable provided by EUROSTAT (European Commission, 2012). All respondents had to be 15 years old or older, residents of their countries, EU-citizens and have command of one of their country's respective languages. Topics for the Eurobarometer 77.2 included opinions about the economic and financial crisis, social service helplines, rail service, food production and quality, and cyber security (European Commission, 2012a). The survey included three questions that asked respondents about their concern about an aspect of food security, food production sufficiency in their own country, the EU or the world.

Although a few descriptive analyses have been conducted and published (European Commission, 2013b), additional descriptive and inferential statistical analyses were conducted for this study in order to test the research hypotheses. In order to test which factors affected the likelihood of concern about national, European or global food security, the following logistic regression model was applied:

$$\ln(p/1-p) = \beta_0 + \beta_1(X_1) + e$$

*Dependent Variables (ln(p/1-p)):* The outcome variables were concern about food sufficiency in *one's own country*, the *European Union* and *the world*. Although the Eurobarometer 77.2 does not provide a measure of one's concern about food security specifically, there were three questions that asked about concern about one aspect of food security, food production sufficiency. *Food sufficiency in one's own country* was indicated by responses to the question, "To what extent are you concerned that sufficient food is produced to meet the needs of the population in [respondent's country]?" Responses were coded as "Very Concerned" and "Somewhat Concerned" = 1, "Not Concerned" = 0. *Food sufficiency in the European Union (EU)* was based upon responses to the question, "To what extent are you concerned that sufficient food is produced to meet the needs of the population in the European Union?" Again, responses were coded as "Very Concerned" and "Somewhat Concerned" = 1, "Not Concerned" = 0. *Food sufficiency in the world* was similarly indicated by the response to the question, "To what extent are you concerned that sufficient food is produced to meet the needs of the population of the world?" Once again, responses were coded as "Very Concerned" and "Somewhat Concerned" = 1, "Not Concerned" = 0.

*Independent and Control Variables at the Individual Level (X):* In order to test and control for the effects of individual level factors that might influence concern about food sufficiency in one's own country, the EU or the world, a variety of measures from the survey were included in the analyses. *Female* was based upon the coding for "Gender" provided in the Eurobarometer 77.2 data set. "Females" were coded as "1," and "males" were coded as "0." *Age* was measured as the response to the question, "How old are you?" and reported in years. *Married or Cohabiting* was coded as 1 = "Married," "remarried" or "single and living with a partner" and 0 = "Other" (including single, divorced or separated and widowed). *Employed* included "employed" (by others) and "self-employed" coded as "1" and "not working" was coded as "0." *Length of Education* was measured as age when a respondent completed full-time education ("20+ years" =1, "less than 20 years" =0). This measure allowed for comparisons across countries with different educational systems. *Rural or Small Village* included responses to the questions, "Would you say you live in a rural area or village, small or middle-sized town, large town?" (Coded as "Rural or small village" =1, "Other" = 0). *Right-leaning Ideology* was the response given to the question, "In political matters people talk of "the left" and "the right." How would you place your views on this scale? The scale was from 1 to 10, with higher numbers indicating right-leaning ideology. *Level in Society* was the response given to the question, "On the following scale, step '1' corresponds to "the lowest level in the society"; step '10' corresponds to "the highest level in the society." Could you tell me on which step you would place yourself?" The scale ranged from 1 to 10. Respondents were asked whether they had a difficult time paying their bills. *Difficulty Paying Bills* was coded as 1 = "Most of the time" and "From time to time" and 0 = "Almost never/never."

*Independent Variables at the Country Level (X):* To test the effects of macro-economic conditions on individual responses, three variables at the country-level were included in the analyses. *Change in GDP/capita PPS* was a measure reported by Eurostat (2015a). GDP/capita PPS was calculated based upon a county's GDP/capita "in relation to the European Union (EU28) average set to equal 100." Expressing GDP/capita in PPS allowed for comparison across currencies (Eurostat 2015b). The *Change in GDP/capita PPS* was calculated by subtracting the GDP/capita PPS reported for 2007 from the 2011 GDP/capita PPS for each country and entered for each case based upon the respondent's country of residence. *2011 Unemployment Rate* was included as the 2011 unemployment rates (%) for each of the 27 countries and entered for each individual respondent, depending on their countries of residence (Source Eurostat 2014). *2011 Social Exclusion Rate* was indicated by the percent of the total population of their country falling within at least one of three categories of being at risk of poverty or social exclusion for 2011. Categories included: 1) Persons at-risk-of poverty after social transfers, 2) Persons

severely materially deprived, 3) Persons aged 0-59 living in households with very low work intensity (Source: Eurostat, 2012).

Baseline analyses were conducted with only individual-level independent and control variables and then again, with country-level variables included. Step-wise logistic regression analyses were conducted by including the independent and control variables in the models one at a time, and tests for multicollinearity were conducted and showed that results were robust across models. Path analyses were not performed due to the exploratory approach of this study and because the independent variables were a mix of dichotomous and continuous measures, which “make[s] path analysis impossible” (Webley & Lea, 1997).

## Results

Tables 1 and 2 provide descriptive information. While less than half (43.7%) of the respondents from all countries expressed concern about food sufficiency in their own countries, and only 41.2% were concerned about food sufficiency in the EU, 77.8% were concerned about food sufficiency for the world. Just slightly over half of the sample was female (51.7%), almost two-thirds (64.2%) were married or cohabiting, and 40.2% had children living in their household. The average age of the respondents was 46.76 (in Table 2) and 29.5% had completed formal education past age 20 or higher. Less than half (48.7%) were employed, including those who were self-employed. On average, respondents placed themselves in the middle levels of society (5.46 on a 10 point scale) and almost exactly in the middle (5.07 on a 10 point scale) in terms of Left/Right political ideology. Just less than one-third of the sample was from a rural area or small village (32.8%) and 38.2% reported having difficulty paying their bills some or most of the time. The mean change in GDP/capita PPS was -.73 (reported in Table 2). The mean unemployment rate in the respondents’ countries was 9.86% in 2011, and the mean % of citizens who fell within one of the three categories of social exclusion in the respondents’ countries was 22.39 for 2011.

Table 1. Descriptive Frequencies:

	Frequency	Valid Percent
Concerned about sufficient food production for own country	11478	43.7
Concerned about sufficient food production for EU	10836	41.2
Concerned about sufficient food production for World	20110	77.8
Female	13736	51.7
Married or cohabiting	16838	64.2
Children in household	10537	40.2
Length of Ed. 20+ Years	7014	29.5
Employed (by self or other)	12948	48.7
Rural or small village resident	8717	32.8
Had difficulty paying bills some or most of the time	9878	38.2

Table 2: Descriptive Statistics

	Mean	SD	Min	Max
Age	46.76	18.41	15	98
Self-placement of level in society	5.46	1.56	1	10
Right-leaning Ideology	5.07	2.05	1	10
Change in GDP/capita PPS	-.73	7.17	-17.00	11.00
Unemployment Rate	9.86	4.94	4.20	21.40
Social Exclusion Rate	22.39	5.84	14.60	49.10

Bivariate correlations are reported in Table 3. The variables most strongly correlated with concern about food production in one's country included Change in GDP/capita PPS ( $r=-.257$ ,  $p=.000$ ), 2011 Unemployment Rate ( $r= .335$ ,  $p=.000$ ) and 2011 Social Exclusion Rate ( $r=.202$ ,  $p=.000$ ). Few variables were moderately correlated with the other dependent variables measuring concern about food production in the EU or in the world. Variance Inflation Factors (VIFs) of less than 2.0 indicated that the results were not affected by multicollinearity, and results were robust with different models that included each of the country-level variables separately or in various combinations

**Table 3. Bivariate Correlations**

	Food Production Sufficient for EU	Food Prod. Sufficient for World	Female	Married or Living with Partner	Children in Household	Age	Length of Education 20+ Years	Level in Society	Employed (by self or others)	Right Leaning Ideology	Rural area or small village	Difficulty paying bills some or most of time	Change in GDP/capita PPS	2011 Unemployment Rate	2011 Social Exclusion Rate
Food Production Sufficient for Own Country	..751** .000 25787	.213** .000 25723	.016** .000 26311	.018** .003 25266	.003 .000 25919	.005 .421 25266	-.065** .000 23461	-.123** .000 25496	-.018** .004 26266	-.028** .001 20861	.043** .000 26241	.161** .000 255641	-.257** .000 25109	.335** .000 21797	.202** .000 25109
Food Production Sufficient for EU		.339** .000 25505	.017** .005 25849	.012* .049 25507	.005 .413 25507	.004 .539 25849	.059** .000 23072	-.091** .000 25112	-.010 .107 25849	-.026** .017 20593	.034** .000 25827	.135** .000 25157	.287** .000 21416	.147** .000 21416	.147** .000 24718
Food Production Sufficient for World			.032** .000 25851	.005 .405 25519	.004 .545 25519	.040** .000 25851	.022** .001 23096	.019** .002 25851	.000 .996 25851	-.068** .000 20647	-.020** .002 25827	-.032** .000 25180	-.046** .000 24749	.030** .000 21450	-.016** .012 24749
Female				-.046** .000 26242	.092** .000 26242	.061** .000 26593	-.049** .000 23741	-.018** .487 25795	-.129** .000 26593	-.007 .328 21073	-.001 .818 26568	.032** .000 25874	.006 .339 25406	.000 .999 22032	.001 .831 25406
Married or Living with Partner					.338** .000 26242	.108** .000 26242	.031** .000 23600	.080** .000 25473	.175** .000 26242	.026** .000 20820	.045** .000 26218	-.067* .000 25563	.087** .000 25118	-.030** .000 24758	.012 .056 25118
Children in Household						-.146** .000 26242	.034** .000 23600	.013* .044 25473	.241** .000 26242	.013 .065 20820	.044** .000 26218	.088** .000 25563	.024** .000 25118	.034** .000 21758	.013* .036 25118
Age							-.148** .000 23741	-.039** .000 25795	-.264** .000 26593	.019** .006 21073	.042** .000 26568	-.122** .000 26874	.011 .075 25406	-.028** .000 22032	.006 .336 25406
Length of Education 20+ Years								.209** .000 23062	.223** .000 23741	-.026** .000 19055	-.071** .000 23741	-.144** .000 23263	.039** .000 22645	-.040** .000 19591	-.099** .000 22645
Level in Society									.137* .015 25795	.112** .000 20709	-.047** .003 25771	-.300** .000 25254	-.031** .000 24622	-.145** .000 21398	-.143** .000 24622



## Logistic Regression Analyses Results

*Concern about Food Sufficiency in One's Own Country:* The base-line results for the model excluding the country-level data (Table 4) show who was more or less likely to be concerned about food sufficiency in their own countries. Those more likely to be concerned included respondents from rural areas or small villages (18.7% more likely) and those who had difficulty paying their bills (69.9% more likely). Meanwhile, those who were less likely to be concerned included older respondents (0.5% less likely for each additional year of age), those who continued their full-time education to age 20 or higher (13.3% less likely), those who rated themselves at a higher level in society (9.9% less likely for each additional rating point), employed respondents (12.8% less likely) and those who self-identified as leaning toward the right in terms of ideology (2.1% less likely).

The model including the country-level variables (Table 4) provided slightly different results. While rural/small village respondents (23.1% more likely) and those with difficulty paying bills (54.8% more likely) were still more likely to express concern about food sufficiency in their own countries and those who continued their formal educations to age 20 or higher (15.6% less likely), and those who rated themselves higher in terms of level in society (11.0% less likely for each additional rating point) were also still less likely to be concerned, age, employment status and political ideology were not significant in this model. The country-level variables revealed that for each point increase in GDP/capita PPS in a respondent's country, a respondent was 4.7% less likely to be concerned about food security in her or his own country. For each percentage increase in a respondent's country's unemployment rate, a respondent was 11.5% more likely to be concerned, and for each additional percentage of citizens of a respondent's country who fell within one of three categories of social exclusion, a respondent was 1.2% more likely to be concerned about food sufficiency in their own country. With Cox & Snell and Nagelkerke  $R^2$ 's between .153 and .206, this model offers more predictability than the model without the country-level variables, if one accepts the premise that  $R^2$  indeed is a useful statistic and not a statistic easily influenced by many factors (Shalizi 2015: 18). However, the focus of this paper was not overall prediction of the outcome of the dependent variable as much as it was an attempt to observe the coefficients associated with the individual independent variables and to understand how different specific statuses, including the economic situations of respondents' countries, influenced concerns about food production.

Table 4: Logistic Regression Results for Concern about Food Security in Own Country

	Individual-Level Factors			With Country-Level Factors		
	<i>B</i>	<i>SE</i>	Odds	<i>B</i>	<i>SE</i>	Odds
Female	.023	.031	1.023	.004	.036	1.004
Married or Cohabiting	.012	.035	1.012	.064	.041	1.066
Children in Household	-.014	.034	.986	-.063	.041	.939
Age	-.005**	.001	.995	.000	.001	1.000
Length of Education	-.143**	.035	.867	-.169**	.040	.844
Level in Society	-.104**	.011	.901	-.117**	.013	.890
Employed	-.136**	.037	.872	.027	.043	1.028
Right/Left Ideology	-.021**	.008	.979	-.006	.009	.994
Rural or Small Village	.171**	.032	1.187	.207**	.038	1.231
Difficulty Paying Bills	.530**	.034	1.699	.437**	.041	1.548
Change in GDP/capita PPS in Respondent's Country				-.048**	.003	.953
Unemployment Rate of Respondent's Country				.109**	.005	1.115
Social Exclusion Rate in Respondent's Country				.012**	.003	1.012
Constant	.496**	.103	1.642	-1.217**	.143	.296
Cox & Snell $R^2$	.037			.153		
Nagelkerke $R^2$	.049			.206		

$p \leq .05$ , \*\* $p \leq .01$

*Concern about Food Sufficiency in European Union:* Table 5 provides results from the base-line analyses excluding the country-level variables, as well as those including them. These results show that similar factors to those that influenced likelihood of concern about food sufficiency in one's own country also affected concern about food sufficiency regionally, within the European Union. In the model excluding the country-level data, those from rural areas and small villages were 17.5% more likely and those with difficulty paying their bills were 57.8% more likely to express concern about food sufficiency in the EU. For each additional year of age, respondents were .4% less likely to be concerned. Those who continued their full-time education to age 20 or higher were 13.3% less likely, those who rated themselves higher in terms of level in society were 6.5% less likely to report such a concern about European food sufficiency. Employed respondents were 8.8% less likely and those who rated themselves with right-leaning ideologies were 2.4% less likely to be concerned for each additional point on the political ideology scale.

With the country-level variables included, a similar pattern emerged, as shown in Table 5. Rural and small village respondents, as well as those with difficulty paying bills were more likely to be concerned about food sufficiency in the EU (18.8% and 44.2% more likely, respectively). Those who continued their full-time educations to age 20 or higher and those who rated themselves higher in terms of level in society were less likely to express this concern (17.0% and 7.2%, respectively). While the likelihood of concern about food sufficiency in the EU decreased with increases in the changes in GDP/capita PPS (3.4% less likely) and increased with higher unemployment rates (9.7% more likely), the social exclusion rate within a respondent's country was not a significant factor influencing one's concern about food sufficiency in the European Union. Once again, the  $R^2$  values on the model with country-level variables were higher (Cox & Snell  $R^2 = .104$  and Nagelkerke  $R^2 = .141$  versus .026 and .035 without the country-level variables included), but caution is suggested when interpreting the meaning of these statistics (Shalizi 2015: 17-19).

Table 5: Logistic Regression Results for Concern about Food Security in Europe

	Individual-Level Factors			With Country-Level Factors		
	<i>B</i>	<i>SE</i>	Odds	<i>B</i>	<i>SE</i>	Odds
Female	.039	.031	1.040	.063	.036	1.065
Married or Cohabiting	-.052	.035	.949	-.007	.040	.993
Children in Household	.027	.035	1.028	-.023	.040	.977
Age	-.004**	.001	.996	.000	.001	1.000
Length of Education	-.143**	.035	.867	-.186**	.040	.830
Level in Society	-.068**	.011	.935	-.075**	.013	.928
Employed	-.092*	.037	.912	.044	.043	1.045
Right Leaning Ideology	-.024**	.008	.976	-.012	.009	.988
Rural or Small Village	.161**	.033	1.175	.172**	.037	1.188
Difficulty Paying Bills	.456**	.034	1.578	.366**	.040	1.442
Change in GDP/capita in Respondent's Country				-.034**	.003	.966
Unemployment Rate or Respondent's Country				.093**	.004	1.097
Social Exclusion Rate in Respondent's Country				.000	.003	1.000
Constant	.229*	.103	1.258	-.968**	.142	.380
Cox & Snell $R^2$	.026			.104		
Nagelkerke $R^2$	.035			.141		

\*  $p \leq .05$ , \*\* $p \leq .01$

*Concern about Food Sufficiency in the World:* Results from logistic regression analyses of respondents' concern about global food sufficiency (Table 6) revealed a very different picture. Within the model excluding country-level variables, women were more likely (19.8%) to be concerned about global food security. A few of the effects switched direction. For example, with each additional year of age, respondents were .7% more likely to be concerned. Those who rated themselves higher in terms of level in society were more likely (8.8% for each additional rated point on the scale) to express a concern about the world's food production. For each additional self-rated right-leaning point and if they experienced difficulty paying

their bills respondents had a *lower* likelihood (7.4% and 10.4%, respectively) of being concerned about global food sufficiency.

With the country-level variables included, women were still 18.5% more likely than men to be concerned about global food sufficiency (see Table 6). With each additional year of age, concern increased by .9%. If a respondent continued full-time education past age 20 or higher, the likelihood of concern increased by 10.7%, and if they were employed the likelihood of concern increased by 13.6%. Likelihood of concern decreased by 7.6% for each additional point toward a right-leaning political ideology. Global concern also decreased by 10.9% if they reported difficulty paying their bills. If a respondent's country experienced a more positive change in GDP/capita PPS or if it had a higher social exclusion rate, the respondent was *less* likely (0.8% for each point and 1.8% for each percentage increase) to express concern about global food sufficiency. For each additional percentage point of unemployment within a respondent's country, the likelihood of concern about global food sufficiency increased by 2.2%. Both models resulted in low R<sup>2</sup> values, but considering that 77.8% of the 25,851 respondents included in the analyses expressed concern about global food production sufficiency, it is unlikely that changes to the model, by adding independent variables (questions from the survey), would increase these values significantly.

Table 6: Logistic Regression Results for Concern about Food Security in the World

	Individual-Level Factors			With Country-Level Factors		
	<i>B</i>	<i>SE</i>	Odds	<i>B</i>	<i>SE</i>	Odds
Female	.181**	.037	1.198	.170**	.041	1.185
Married or Cohabiting	-.015	.042	.985	.034	.047	1.035
Children in Household	.045	.041	1.146	.020	.046	1.020
Age	.007**	.001	1.007	.009**	.001	1.009
Length of Education	.085*	.042	1.088	.101*	.046	1.107
Level in Society	.029*	.013	1.029	.012	.015	1.012
Employed	.089*	.045	1.093	.128**	.049	1.136
Right Leaning Ideology	-.077**	.009	.926	-.079**	.010	.924
Rural or Small Village	.012	.039	1.012	-.014	.043	.986
Difficulty Paying Bills	-.110**	.041	.896	-.116*	.047	.891
Change in GDP/capita in Respondent's Country				-.008**	.003	.992
Unemployment Rate or Respondent's Country				.021**	.005	1.022
Social Exclusion Rate in Respondent's Country				-.018**	.003	.982
Constant	1.092**	.121	2.981	1.278**	.162	3.589
Cox & Snell R <sup>2</sup>	.008			.012		
Nagelkerke R <sup>2</sup>	.013			.019		

\*  $p \leq .05$ , \*\* $p \leq .01$

## Conclusion

In summary, similar factors influenced respondents' concern about food sufficiency in their own country and the EU. As hypothesized, if a respondent lived in a rural or small village, had difficulty paying bills some or most of the time and lived in a country with higher unemployment rates, she or he was more likely to be concerned about food sufficiency in one's own country or the EU. If a respondent completed full-time education at age 20 or higher and rated herself or himself higher in terms of level in society (social class) and lived in a country with higher increases (or lower decreases) in GDP/capita PPS, he or she was less likely to be concerned about food sufficiency in one's own country or the EU. The only factor that influenced one's concern differently, depending on whether it was concern about food sufficiency in one's own country or the EU, was the percent of residents who fell within one of three categories of social exclusion. Living in a country with higher levels of social exclusion increased the likelihood of concern about food sufficiency in one's own country, but was not a factor influencing likelihood of concern about food sufficiency in the EU.

Concern about food sufficiency in the world was influenced by a few different factors from those influencing concern about food sufficiency in one's own country or the EU. Older respondents and those who completed full-time education at age 20 or higher were more likely to be concerned about global food sufficiency. Unexpectedly, women were more concerned about global food production, but gender was not a factor influencing concern at the country or European level, which contradicts one research hypothesis. As a respondent's self-reported political ideology leaned right and if they lived in a country with increases in GDP/capita PPS, their likelihood of expressing concern about global food sufficiency decreased. As the percent of residents within a respondent's country who fell within one of three categories of social exclusion increased, the likelihood of being concerned about food sufficiency in the world decreased, as well. If they lived in a country with higher unemployment rates, their concern increased.

In general, the effects of the Great Recession were associated with disparate concerns about food security amongst EU residents. Those living in countries with higher unemployment rates, those from countries like Spain (21.4%) or Greece (17.7%), were more likely to be concerned about food sufficiency *everywhere*. Meanwhile respondents from countries with lower unemployment rates, those from countries like Austria (4.2%) or the Netherlands (4.4%), were less likely to express concern about food sufficiency. Likewise, those respondents from countries with increases (or lower decreases) in GDP per capita, those in countries like Luxemburg (+11 PPS) or Germany (+6 PPS), were less likely to be concerned about food production sufficiency *anywhere*. However, living in a country with higher rates of social exclusion, like those found in Bulgaria (49.1%) or Latvia (40.1%), increased one's likelihood of being concerned about food sufficiency in one's own country, but decreased the likelihood of being concerned about global food sufficiency.

These results support the hypothesis that personal financial struggles (difficulty paying one's bills) and living closer to poor economic conditions (higher rates of social exclusion within one's own, more immediate sphere) increased the likelihood of more localized concerns about sufficient food production. In fact, experiencing personal financial struggles actually decreased the likelihood of more altruistic, global concerns. Additionally, it is likely that exposure to news stories about fellow country mates seeking food assistance or increases in local food bank dependence created heightened awareness of social exclusion and food security issues. Such awareness of local social exclusion likely preoccupied people's concerns to the point where worrying about global food sufficiency seemed unimportant compared to the seriousness of their personal or local difficulties. Caring about global problems is a luxury for those not weighed down by the daily stress of poverty and financial struggles. Deprivation increased concern about one's own needs (Mahoi and Bryant 1998).

The fact that concerns about food sufficiency were correlated with social exclusion and unemployment was not surprising. Because there is a spatial dimension to poverty and social exclusion (Madanipour et al., 2015), it was expected that concerns about where food sufficiency was a problem would have national and regional variations. Such spatial differentiation complicates policymaking. Responses to food supply problems are likely to be localized (Madanipour et al., 2015) and not considered serious issues needing attention by citizens and elected officials in those regions of the EU not experiencing as much hardship.

Europeans living in countries like Luxemburg and Germany, where unemployment and social exclusion rates were lower than other countries and where there were signs of economic growth, were more concerned about food production globally, but less concerned locally. Europeans whose immediate needs of food and shelter were not a daily worry could consider the needs of others outside of their local province or express concerns reflecting more philosophical, self-actualized values (Maslow, 1954). Support for food and agricultural policies focused on feeding the world would most likely be popular amongst such Europeans. Such Europeans more likely would support providing funding to the Food and Agriculture Organization (FAO) of the United Nations, since they were more likely to express a "global imagination" related to food sufficiency (Phillips and Ilcan, 2003). However, they might be less supportive of programs and funding focused on assisting their fellow Europeans, since they might not believe such programs are necessary.

A limitation of this study was that changes in concern about sufficient food production could not be tested, since Eurobarometer data on such questions were not collected before 2007. Additionally, the questions about concern about food production sufficiency provided a very narrow measure of concern related to food security. Questions that included beliefs about the ability to access nutritional food in socially acceptable ways, for example, would have provided a more direct measure of concern about the broader concept of food security. Analyses and conclusions were limited by the data available and dependent upon the reliability and validity of the measures resulting from methods used to collect the data.

Limitations aside, it is important to understand the attitudinal differences between Europeans on food production sufficiency as the EU moves forward through economic recovery. By understanding why some Europeans were more concerned about local versus global food production, policy makers will be better able to acquire support for relevant changes in food and agricultural policies. Local and national government officials, as well as members of the European Parliament can gain trust as they recognize the differences in concerns between citizens of this diverse geopolitical region. The European Parliament has already created policies to address deprivation amongst European citizens (Braye, 2012). Policies such as the Fund for European Aid to the Most Deprived (FEAD) will more likely be supported and implemented in those countries where concern is more local. As of 2015, FEAD had €38 billion set aside to provide non-financial aid, such as food, clothing and other personal items to facilitate social inclusion (European Commission, 2015). One challenge for policymakers will be to rally support for such programs from Europeans not as concerned about deprivation in their own countries or the rest of the European Union because their economic conditions are not so dire.

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