A Media Analysis of Food Crisis: From Qualitative Analysis to a Quantitative Approach

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Paper prepared for presentation at the EAAE 2014 Congress
'Agri-Food and Rural Innovations for Healthier Societies'

August 26 to 29, 2014

Ljubljana, Slovenia

Abstract

In 2007-2008, when food prices started to increase dramatically, purchasing power parity of consumers started to decrease automatically. High food prices were argued to cause poverty, hunger, and food riots among urban populations. Henceforward, ‘food crisis’ became a new story line on the current debate. This paper analyzes different media coverage of urban consumers and rural producers under changes in relative incomes for the 2000-2013 period and propounds media bias on the food crisis debate by using content analysis and OLS regression model.

Keywords: food crisis; media bias; content analysis; relative income

1. Introduction

"We have all become addicted to breaking news on a crisis like this."

Eli Flournoy, director of CNN's international news source

In 2007-08, world food prices reached record levels, rising 80% in 18 months. Following this peak, food prices fell, but since 2009 the cost of food has been climbing steadily in global markets, reaching record highs again in 2011. Over the last five years, the FAO food price index has risen by 92%, threatening the lives and livelihoods of millions of people (FAO, 2012: 2).

A wide range of research has examined the (potential) impacts of higher food prices on poverty (Ahmed et al., 2007; Aksoy and Isik-Dikmelik, 2010; Dessus et al., 2008; Headey and Fan, 2008; IMF, 2008; Ivanic and Martin, 2008; Wodon et al., 2008; Wodon and Zaman, 2008; World Bank, 2008; Zezza et al., 2008). Although we still do not know the accurate welfare effect of higher food prices on urban, rural and country level poverty, the findings of the studies suggest that the overall impact of higher food prices on poverty is generally adverse. For some studies this conclusion is much more obvious for urban consumers. Surprisingly, the study by Ivanic and Martin (2008) shows that rural poverty increases more than urban poverty does, for two out of three countries examined. However Aksoy and Isık-Dikmelik (2010) analyze some of the same surveys as Ivanic and Martin (2008), and they end up with different results.

The real welfare effect of higher food prices depends on whether the poor are net buyers or net sellers of food. Since rural populations also have large numbers of net buyers of food it depends on whether they are marginal net buyers or sellers. Low prices on the world market benefit net buyers and hurt net sellers of the specific product. However, a straightforward implication of these basic principles is that urban consumers lose and rural farmers gain in post-2007 period, and vice versa in pre-2007 period; media coverage of food crisis is limited to food price inflation (i.e. urban consumers). Since public officials react to media news because they see it as a reflection of public opinion (Kim, 2005:3), the media are important actors in policy making. Paying a disproportionate amount of attention to the problems of urban consumers and yet not paying any attention to the problems of rural farmers (i.e. media bias) will translate into bad policies (i.e. policy bias).

The paper starts by presenting a simple theoretical framework to appraise the possible welfare effects of food price changes. It then moves to presenting the methods which are used.

It demonstrates the results and discusses whether the media discourses are biased and whether media bias translates into policy bias. Finally, it draws conclusions.

The present study seeks to provide evidence on the question arising from the dramatic increase in food prices. Are media biased on the food crisis debate by reporting in favor of urban consumers?

The main objectives of this study are to illustrate the perception of the 'food crisis' concept on the media, to explore the differences in media attention between urban consumers and rural farmers under food price changes, and to make a dynamic and progressive contribution to further applied economics researches.

2. A Framework for Discussion

The basic principles of agricultural price changes and their effects on consumers and producers are shortly summarized in *The Right Price of Food* by Swinnen (2010). As a starting point, Swinnen's work is followed to set a framework on high versus low food prices. A simple model of an open economy with two groups is considered: producers and consumers of food, where prices are determined at the world market, and local production or consumption do not have any impact on global prices (i.e. small country assumption). The basic framework to assess the effects of changes in prices for staples is straightforward. Consumers will lose from price increases; producers will gain, and vice versa when price decrease. As many households in developing countries will be both producers and consumers, the net impact effect of price changes will be determined by which effect is greater: whether the household is a net consumer or a net producer (Deaton, 1989). The effect of world market price changes may differ for countries – due to different trade policies, institutions, and the industrial organization of the food chain – or local production and consumption may affect local prices, the exogenous shocks may also be caused by nature or by people, or short-run effects may differ from the long-run effects. All these extensions do not fundamentally change the basic principle of the simple model: when prices go up, consumers lose and producers gain, and vice versa. (Swinnen, 2010: 4-5).

3. Methodology

This study derives categorical data from the qualitative data in order to quantitatively analyze different media coverage of urban consumers and rural producers under changes in relative incomes. Content analysis (CA), which is a method of chancing qualitative data into quantitative data, is chosen as a main method in the present study. Moreover, a summative approach to qualitative content analysis which goes beyond mere word counts to include latent content analysis is adopted (Hsieh and Shannon, 2005: 1283).

Data analysis begins with identifying and quantifying the core keywords in text. Word frequency counts for each identified keyword to classify textual data and identify patterns in it. The purpose is to understand the contextual use of the keywords, interpret the context associated with the use of the keywords and discover the content. Data analysis continues with quantitative analysis. The OLS regression model is applied to the categorical data derived from qualitative data. Finally the results from qualitative and quantitative analysis are compared.

3.1. Data Source

In this paper, the articles reported on the food crisis over the 13-year period are analyzed. These articles were published in three international newspapers, since January 2000 till mid-April 2013; more specifically, before, during and after the '*global food crisis*'. 78, 159 and 100 reports, respectively taken from the online versions of The Economist, The Guardian and The Mail & Guardian, are investigated. The reason for choosing these three newspapers as representatives of the entire group of newspaper magazines are their being highly ranked and creditable all over the world; having printed and online formats that give audiences the opportunity to search online; and being owned by companies, and not by goverments which shows that they represent the views of their stakeholders and the audiences. Text selection was based on standard techniques, such as keyword computer searches: for instance, *food crisis, world food crisis, global food crisis*.

3.2. Developing the Coding Scheme

Developing a coding scheme is one of the most crucial steps in content analysis since the codes provide the classification system for the analysis of qualitative data. The basic coding process is to reorganize large quantities of textual data in a way that enables retrieving data by much fewer content categories that are analytically useful to the study.

Once the theoretical framework is built, the research questions to be answered are formulated and the text to be analyzed is selected then the priori major codes, such as '*food crisis, food prices, urban consumers vs. rural farmers*' are identified. ATLAS.ti, a qualitative data analysis software, is used to support the coding process, such as coding the texts, retrieving them based on keywords and picturing the relationships of codes.

The first step of coding process is deductive. After a preliminary coding, the process becomes inductive by close reading. New codes are identified and some priori codes are eliminated. The process was repeated several times for each code in order to minimize the subjectiveness of the coder. When the coding is done, the next step is to quantify each code in order by the publication date of the reports that the codes were stated. The frequencies of the codes bring into being quantitative data for the statistical analysis.

3.3. The OLS Model and Hyphothesis

The analysis contiues with the Ordinary least-squares (OLS) regression model where '*the code of food crisis'* (i.e. annual frequencies of *global food crisis* statements) is a dependent variable. The independent variables are the annual frequencies of codes which represent *food price inflation, food riot, poverty, hunger, malnutrition, famine, farmer(negative), farmer(positive), africa food crisis*, a dummy variable (year 2008), and time trend.

The regression equations for the three newspapers are:

$$Y_1 = a_1 + b_1 x_{1+} c_1 x_{2+} + \cdots + n_1 x_{n+} u \quad (1)$$

$$Y_2 = a_2 + b_2 x_{1+} c_2 x_{2+} + \cdots + n_2 x_{n+} u \quad (2)$$

$$Y_3 = a_3 + b_3 x_{1+} c_3 x_{2+} + \cdots + n_3 x_{n+} u \quad (3)$$

where *Y*, and *u* are *T*-vectors, *a, b, …, n* are the *T*k* matrix of regressors, and *x* is the *k*-vector of the parameters. OLS minimizes the sum of the squared residuals.

It is hypothesized that the media will pay more attention to the consumers than to the producers when food prices change, and if this hypothesis is accepted, the results will be significant for the concepts which are related with consumers, such as *poverty, hunger, food riots*, etc., and they will have a positive relationship with *food crisis;* while the results will not be significant for the concepts which are related with farmers, such as *farmer(negative),* and *farmer(positive).*

4. Key Results

4.1. Results from content analysis

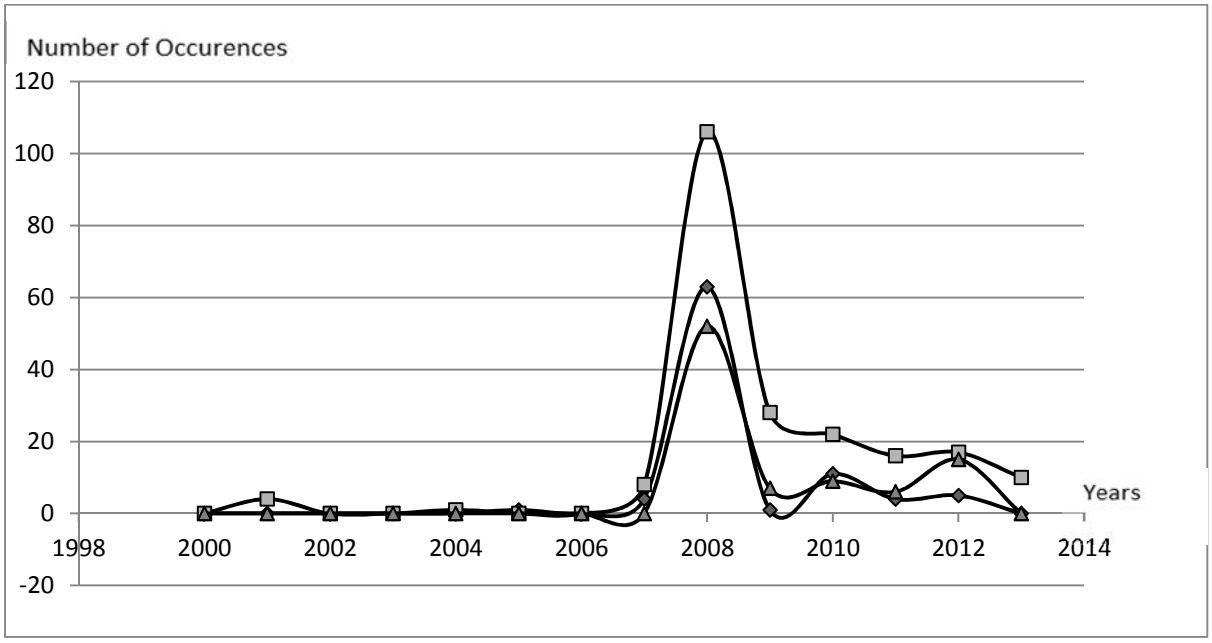

Figure 1. The frequencies of the code '*global food crisis'* stated in *The Guardian* (■), *The Mail & Guardian* (♦) and *The Economist* (▲) by year.

As shown in Figure 1, the global food crisis has been argued in the media since 2007. The numbers of articles which were published in the pre-2007 period and also the frequencies of the code of "*global food crisis*" in these articles are too small to be ignored. In post-2007, especially in 2008, all the newspapers suddenly started to talk about a '*food crisis'* and during all the post- period, they kept talking about it.

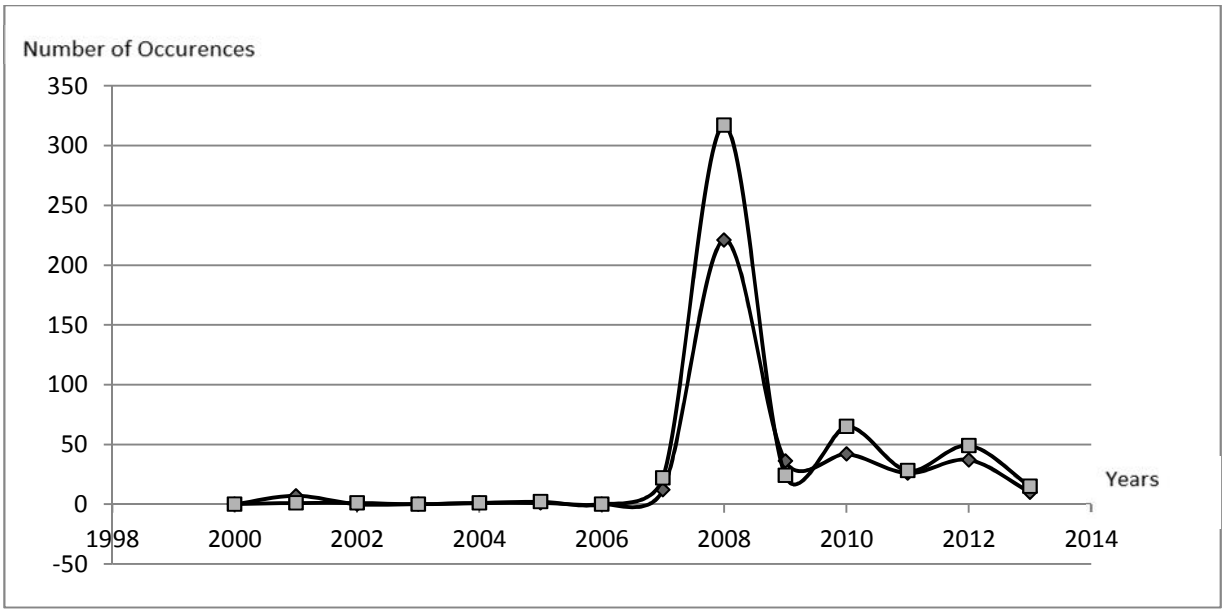

Figure 2. The frequency of the codes '*food price inflation*' (■) and'*global food crisis'*(♦) by year.

What was reasoning this sudden change in communication? The analysis shows that it was '*food inflation'* what leads to *food crisis* talks (Figure 2). There is a dramatic change in the emphasis on *'food price inflation'* in the pre- and after- periods. The results show the change in emphasis on '*food price inflation*' is more dramatic than the change in emphasis on '*food crisis'* for pre- and post- periods. Also, changes in emphasis on both codes move in the same direction. For example, in 2010, a second increase in food prices after a shock increase in 2008 made the media talk about a '*food crisis'* again. We should also take into consideration that in some articles, '*food price inflation'* was used as a complement to or even instead of '*food crisis'*. '*Food crisis'* has been mentioned in most of the articles where '*food price inflation'* has been mentioned. The media name the situation of the changes in prices, which starts to hurt consumers, as a '*crisis*'. Up to this point, the situation is analyzed only from the consumer's side.

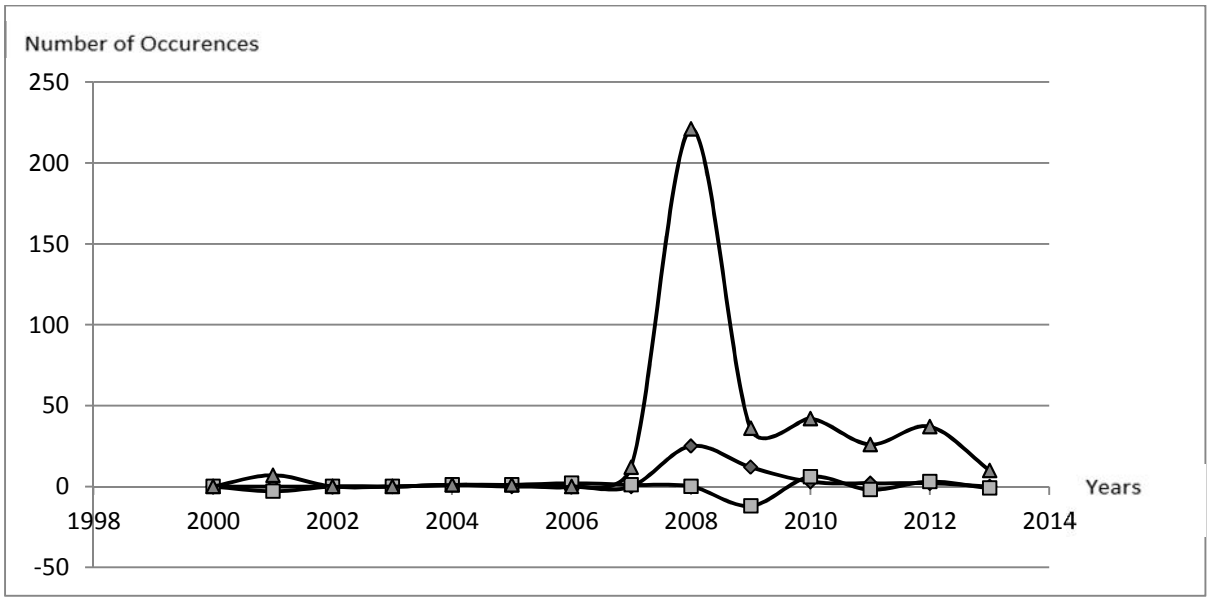

Figure 3. The frequencies of the codes '*global food crisis'* (▲), '*farmers-positive'* (♦) and '*farmers-negative'* (■) by year.

In Figure 3, positive farmer-side discourses, such as:

"…Farmers in developed countries are the winners of food crisis…,

…Farmers benefit from high food prices…"

refer to 'farmers-positive' while negative farmer-side discourses, such as:

"…Farmers who were already poor became poorer…,

…Poor farmers could not benefit from the high food prices…''

refer to 'farmers-negative'.

As said before, consumers will lose from price increases; producers will gain, and vice versa when price decrease. Since the food prices were very low in the pre-2007 period, one would expect the media to mention the losses of farmers; however, we do not find it in media arguments. In the pre- period, farmers were mentioned only 12 times which consist of 11 negative discourses and 1 positive discourse. We daresay that there was a lack of media coverage of the losses of the farmers. Additionally, one would expect the media to mention the benefits of farmers in the post-period, when the food prices increased dramatically. However positive discourses start to appear, negative discourses still exist, to an even larger extent. Surprisingly, negative discourses concerning farmers (99 statements) are much more than positive discourses (44 statements) in the post- period. Negative discourses refer to farmers in developing countries, while positive discourses refer to farmers in developed countries. Considering that some of the farmers in developing countries are net buyers of food and most of the farmers hurt by increasing energy prices, it is not surprising anymore that negative media coverage of farmers in the post- period is quite large. However, the emphasis on farmers in the post- period is much stronger than the pre- period; the overall emphasis on farmers is very little comparing to the overall emphasis on the concepts concerning consumers. In total media coverage of consumers is 6 to 8 times (depends on taking ‘‘*food price inflation*’’ into account) bigger than media coverage of farmers.

4.2. Results from the OLS regression

Each explanatory variable in the model is assessed: Coefficient, Probability or Robust Standard Errors (HAC), and Variance Inflation Factor (VIF). The T-test is used to assess whether or not an explanatory variable is statistically significant. Each consumer-side explanatory variable is expected to be significant and the signs of the coefficients to be positive. In contrast, farmer-side explanatory variables are expected to be non-significant. The models do not include first order autocorrelation (i.e. the Durbin-Watson test statistics are very close to 2 in all models). The models for *The Economist* and *The Mail & Guardian* do not include collinearity problem (i.e. the variables which have VIF values bigger than 10.0 are omitted), while the other model includes a negligible collinearity problem (VIF value for food price inflation is 12.699). According to R-squared, in all models, all the explanatory variables modeled using regression explain more than 85% of the variation in the dependent variable (*food crisis*).

Table 1. Summarized OLS Results *

Independent variables/Newspapers	The Guardian		The Economist		The Mail & Guardian	
	Sign of coefficient	Level of significance	Sign of coefficient	Level of significance	Sign of coefficient	Level of significance
food price inflation	+	ns	+	ns	+	***
food riot	+	***	+	ns	-	**
poverty	+	ns	+	*	+	ns
hunger	+	**	+	**	+	*
malnutrition	-	ns	+	ns	-	**
famine	+	*	+	ns	-	ns
farmer(negative)	-	ns	+	ns	-	ns
farmer(positive)	-	ns	+	ns	+	ns
time trend	+	**	+	***	-	ns
dummy 2008	+	**	+	ns	+	ns
africa food crisis	-	ns	-	***	-	ns
R-squared	0.865041		0.851133		0.873680	

*ns: nonsignificant, *: 0.1< p value<0.05, **: 0.01<p value<0.05, ***: p value<0.01

As shown in Table 2, the code of '*hunger*' is significant with a positive coefficient for all the newspapers analyzed. The more we talk about *hunger*, the more we talk about *food crisis*. The other codes concerning consumers, such as *'food price inflation', 'food riots', 'poverty', 'malnutrition*', and *'famine'* are all significant for at least one of the newspapers and have positive coefficients, except malnutrition. The codes concerning farmers are not significant at all. The emphasis on *'food crisis'* do positively change with respect to time. We can also say that the emphasis on *'food crisis'* increased in 2008. African food crises are believed to be local or regional problems mostly caused by bad weather conditions and bad policies. The result from the analysis of *The Economist* show that the media attention shifted from African food crises to global food crisis by time. However it is not clearly shown by the quantitative results, The South African newspaper *(The Mail & Guardian)* differs in coverage of African problems and it kept reporting on 'African food crises' during the global food crisis.

Finally, the regression results substantiate the results from CA by supporting research hypotheses. In contrast with consumers, farmers do not play a significant role in the food crisis debate. Food crisis talks become popular when consumers are hurt by food price changes.

5. Conclusion

As a consequence of increasing food prices, the poor who spend most of their income on food became poorer and the ones in the cities started to protest against high food prices. Worldwide food riots became an important issue in the post-2007 period. Hence, the media started to pay more attention to the consequences of high food prices on consumers, such as poverty and hunger. Eventually *'food crisis'* discourse which was led by *'food inflation'* discourse became a new storyline in the post-2007 period (Figure 2). Even though there were poverty and hunger problems in the pre-2007 period and many of the rural farmers could not afford to grow or buy their own food, there was an absence of media coverage for the food crisis (Figure 3).

Media pay a disproportionate amount of attention to the negative welfare effects of high food prices on consumers, especially in urban areas and ignore the negative welfare effects of low food prices on farmers. Moreover, the media are also selective in reporting the positive welfare effects of high food prices on farmers –at least for the ones in developed countries. There is a lack of media attention to farmers, regardless of how much and in which direction they are affected by food price changes. And there is a disproportionate amount of attention to consumers regarding the negative welfare effects. Since public officials react to media news because they see it as a reflection of public opinion (Kim, 2005:3), selective media coverage (i.e. mass media news bias) will translate into a bias in public policy. Small groups will receive less favorable policies because of the provision of information by mass media firms (Strömberg, 2004: 281).

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