Food Policy 38 (2013) 214–226

Contents lists available at SciVerse ScienceDirect

Food Policy

journal homepage: www.elsevier.com/locate/foodpol

Wheat export restrictions and domestic market effects in Russia and Ukraine during the food crisis

Linde Götz [a,*], Thomas Glauben [a], Bernhard Brümmer [b]

[a] Leibniz-Institute of Agricultural Development in Central and Eastern Europe (IAMO), Halle (Saale), Germany
[b] Georg-August-Universität Göttingen, Department of Agricultural Economics and Rural Development, Göttingen, Germany

ARTICLE INFO

Article history:
Received 16 January 2012
Received in revised form 29 November 2012
Accepted 3 December 2012
Available online 10 January 2013

Linde dedicates this article to Louis & Casimir which have grown much faster than this paper.

Keywords:
Food crisis
Food security
Price insulation
Export controls
Spatial price transmission
Wheat market
Markov switching error-correction model
Russia
Ukraine

ABSTRACT

Studies investigating the effects of wheat export controls on the domestic market in the exporting country itself are scarce. This paper analyses the domestic market impact of wheat export controls in Russia and Ukraine during the 2007/2008 global food crisis within a spatial price transmission approach. Using a Markov-switching vector error-correction model, we contrast our estimation for Russia and Ukraine with Germany and the USA, two countries that did not intervene in their wheat export markets. An explicit "crisis" regime during times of export controls is exclusively identified for Russia and Ukraine. We find that export restrictions temporarily reduced the degree of integration of Russian and Ukrainian domestic markets in world wheat markets, which pushed the growers prices below their long-run equilibrium level. Further, domestic markets were disconnected from their equilibrium and market instability increased. These effects were even more pronounced and long lasting in Ukraine (export quota) than in Russia (export tax). The negative market effects discouraged private investors, thereby preventing Russia and Ukraine from maximizing their grain potential and contributing to global food security.

Introduction

Many governments have intervened in the agricultural export markets during the world market price peaks in 2007/2008 and 2010/2011. In the case of wheat, 15 countries restricted exports in 2007/2008, including such large wheat exporters as Argentina, Kazakhstan, Russia, and Ukraine (Mitra and Josling, 2009).

Russia and Ukraine justified restrictions on wheat exports with the officially stated aim to reduce exports that were induced by the extraordinarily high world market prices in order to secure sufficient wheat supplies in the domestic markets. In particular, Russia implemented export taxes for wheat in 2007/2008, and in light of an extremely small wheat crop, completely banned wheat exports in 2010/2011. In Ukraine, wheat export quotas were introduced within a governmental license system during both price peaks. The purpose of this paper is to quantify the impact of Russia's and Ukraine's grain export controls on their domestic wheat markets within a spatial price transmission model.

Essentially, export restrictions of large exporting countries have a negative impact on food security in two ways (see Sharma (2011) for an overview). First, there is a direct effect on world market supplies through the restrictions of the export limiting country. In phases of high international prices, the world market price increases further, with amplified effects on the food security of the poor in net wheat importing countries. The second consequence is an indirect effect on the domestic market of the export restricting country. By hindering or even banning exports to the world market, supply on the domestic market increases which reduces the domestic market price and increases the difference between the world and domestic market price. This dampens the integration of domestic into world wheat markets. Thus, production and investment incentives of the domestic market decrease, and, in the longer term, hinder agricultural development. This effect will be amplified if the restrictions are introduced and managed in a discretionary and non-transparent way, leading to increased uncertainty and instability for farmers and investors in the affected country. The latter effect is of particular importance in the case of

* Corresponding author. Address: Leibniz-Institute of Agricultural Development in Central and Eastern Europe (IAMO), Theodor-Lieser-Strasse 2, 06120 Halle (Saale), Germany. Tel.: +49 345 2928327; fax: +49 345 2928299.
E-mail address: goetz@iamo.de (L. Götz).

0306-9192/$ - see front matter © 2012 Elsevier Ltd. All rights reserved.
http://dx.doi.org/10.1016/j.foodpol.2012.12.001

Russia and Ukraine since they have large grain production potentials due to fertile soils and high availability of land.[1]

Russia and Ukraine could further increase their role as major wheat exporters (e.g. Liefert et al., 2010). By 2019, the share of the whole region (including Kazakhstan) in global wheat trade could amount to almost 40%, equivalent to more than 50 million tons. However, this development is strongly influenced by Russia's and Ukraine's trade policy, particularly if they continue to temporarily restrict wheat exports. This makes the analysis of the impact of export controls for wheat a particularly relevant topic.

The impact of export restrictions on world market prices during the recent price peaks has received substantial attention in the literature (e.g., Martin and Anderson, 2011; Yu et al., 2011). However, the literature on the effects of export restrictions on domestic markets in the export restricting country is relatively scarce. Exceptions are e.g. Abbott (2012), Mitra and Josling (2009), Grueninger and von Cramon-Taubadel (2008) and Nogués (2008).

This paper is unique in various aspects. First, we quantitatively assess the domestic market effects of the temporary restriction of wheat exports in Russia and Ukraine by studying the impact of the export controls on the relationship between the world market and the local farmers prices. We choose a spatial price transmission approach (Fackler and Goodwin, 2001) as our model framework and evaluate the model results with regard to the integration of the local into the world wheat markets, the equilibrium between the local and the world markets, and the price stability of the local markets. Germany and the USA, two countries which did not intervene in their grain export markets during the food crisis, are included as two reference cases in our analysis to facilitate the correct identification of these effects. The study is based on weekly wheat grower price data for Russia, Ukraine, Germany, and the USA and world price data from January 2005 to May 2009.

Second, given the heterogeneity of world market conditions and domestic policies over the sample period, the model for analyzing price transmission between domestic and international markets should capture changes between a number of regimes governing the market integration processes at a given point in time. We use a Markov switching vector error-correction model (MSVECM), which makes it possible to identify a possible change in the price transmission regime during the food crisis and therefore enables us to capture the impact of the export controls. To the best of our knowledge, none of the studies on world market price transmission covering the food crisis (e.g., Cudjoe et al., 2010; Dawe, 2008) allows for a possible change in the price transmission regime).

Literature review

As explained above, most studies on temporary export restrictions focus on world market effects but only few studies investigate the domestic market effects in the exporting country itself. One example is Mitra and Josling (2009) which analyze the domestic market effects for the different types of export controls based on a partial equilibrium model. In general, export controls lead to welfare losses in the exporting country due to foregone exports. With regard to export taxes and export quotas they point out that high demand responsiveness increases the short-run welfare losses, whereas an elastic demand decreases the short-run welfare losses in the case of an export ban. Strong responsiveness of the supply, however, decreases the welfare losses in the long-run in all three cases. Grueninger and von Cramon-Taubadel (2008) estimate that foregone farm revenues due to export quotas in Ukraine amount to US$ 1.6 billion in 2007/2008 in the case of wheat. It is noted that the milling industry took advantage of the situation on wheat markets and increased the wheat-flour margin with the export quota system. Von Cramon-Taubadel and Raiser (2006) investigate the Ukrainian wheat export quota introduced in September 2006. They find that the export quota is a costly tax on producers and investors in the agricultural sector that may have increased poverty while benefiting only millers and feed producers. Nogués (2008) analyzes the domestic impact of export taxes and export quotas on various agricultural products prevailing in Argentina in mid-2007. The general equilibrium model results imply that the elimination of export barriers increases the respective consumer prices. For example, the removal of a 32.5% export tax on wheat would increase bread prices by 3.5%. They suggest that export taxes should be eliminated since they reduce GDP and increase poverty. Welton (2011) finds that the 2010/2011 wheat export ban did not reduce food prices in Russia. Flour as well as bread prices continued to increase during the export ban and strongly affected Russia's poor people.

Our approach differs from the before mentioned studies in using a spatial price transmission model approach to identify the domestic market effects of export controls. We assume that the price relationships between the domestic and the world market are temporarily changed by the export restrictions. In particular, when exports decrease, the supply on the domestic market increases which has a dampening effect on the domestic price. Therefore, we hypothesize that export restrictions decrease the long-run price transmission.

Recent methodological innovations in price transmission analysis account for non-linearities in the (spatial) price transmission process. For example, a threshold vector error correction (TVECM) and a threshold autoregression model (TAR) capture non-linearities in the error-correction behavior (Balke and Fomby, 1997), and were first introduced in spatial price transmission analysis by Goodwin and Piggott (2001). It is assumed that threshold behavior results from trade costs. Error correcting behavior is observed only for price changes larger than trade costs thus exceeding the threshold, whereas a so-called "band of inactivity" is observed for price changes smaller than the trade costs. Balcombe et al. (2007) investigate price transmission between wheat markets in Brazil, Argentina and USA. They develop a generalized TECM and estimate it within a Bayesian approach. They found evidence for threshold behavior in some cases with the thresholds for the wheat price pair smaller than for maize. Cudjoe et al. (2010) analyzes price transmission between global, national, and regional markets in Ghana to assess the welfare impacts of the 2007/2008 food crisis. The results of a TVECM suggest that the degree to which price changes in world markets are passed onto regional markets within Ghana depends on the pattern of price transmission between local markets. Thus, world market price transmission varies for different food crops and different regional markets, ranging between 40% and 100%. Asymmetry in international wheat markets is investigated by Ghoshray (2002) within threshold autoregressive (TAR) and momentum threshold autoregressive (M-TAR) models for Argentina, Australia, Canada, the EU, and USA. World wheat markets are found to be highly integrated, with only slight evidence of asymmetry. In cases in which price transmission is identified as asymmetric, the author traces this back to differences in wheat quality. A TAR is also applied in Goodwin and Grennes (1998)

[1] For Russia, the additional land potential is estimated to amount to 6 million ha, according to FAO/EBRD (2008). The additional land potential for Ukraine is estimated to amount at a maximum of 10 million ha by USDA (2008) and 3 million ha by FAO/EBRD (2008). Wheat yields in Russia are expected (FAO/EBRD, 2008) to increase from 2.1 t/ha (2008/2009) to a yield level similar to that of Canada (2.3 t/ha), and in Ukraine from 2.8 t/ha to a yield level similar to France (6.3 t/ha).