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## Are we moving towards functioning agricultural markets and trade relations?

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**Introduction to the Special Feature: Are we moving towards functioning agricultural markets and trade relations?**

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**Abstract:** We introduce a special feature on the functioning of international agricultural markets. This feature is motivated by the increased interest in the functioning of commodity markets raised by unprecedented price turbulences since 2008, major structural changes through changed roles of emerging economies and related concerns regarding food security. We argued that the delineation of non-functioning markets from markets that adequately adjusted to adverse framework conditions lacks theoretical foundation. We discuss the relevance of some results on institutions for agricultural markets in emerging and transition countries. A synthesis of the articles included in the special feature is provided by highlighting the selection of topics that span a topical range covering price formation on world and domestic markets, market power and trade policy modelling.

**Keywords:** Market functioning; transition countries.

JEL classifications: Q11, Q13.

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## 1 Assessing market functionality

The title of this special feature suggests that we can discriminate objectively between markets that function well and those that do not, and that we can assess how well they function. We consider the question of whether or not we can actually do this, before introducing the five papers comprising the special feature and their contribution to our understanding of the functioning of agricultural markets.

How can we distinguish functioning from non-functioning markets (or assess the degree of market functioning) and thereby make a practically relevant contribution? When adverse framework conditions entirely prevent any exchange of a good in question we can clearly speak of a non-functioning market (or, better, ought not to speak of a market at all). When a monopolist prevents competitors from accessing a market and charges excessive prices one might identify a dysfunctional market (we will question this view in a moment), but if a non-existent traffic connection (such as prior to the building of the Suez Canal) has the same effect, should we interpret it in the same way? Or should we say that in both cases exchange is expected to efficiently adjust to prevailing conditions and hence conclude that markets do function?

Full functioning of markets could be claimed to be possible (albeit not warranted) when total costs incurred in exchange are at their minimum achievable level. But fulfilment of this condition is not simple to check for two major reasons.

First, there is a counterfactual specification problem, reflecting the conceptual ambiguity of the distinction between functioning and non-functioning markets. There is no objective criterion to distinguish between framework conditions to which market organization "should" adjust and dysfunctional market organization. No natural line of distinction exists between (i) obstacles to exchange that should be understood as exogenous framework conditions which well-functioning trade systems do allow for and, (ii) obstacles that are themselves regarded as part of (or indicators of) non-functioning trade systems (markets). In other words, should we interpret reduced market exchange as a consequence of unexploited potential for exchange, because of dysfunctional markets, or as a consequence of structural conditions which cannot be altered, and to which reduced exchange is an optimally adapted response by fully functional markets?

For example, when an unreliable legal system in a country requires costly insurance against default of contract partners, it is not clear *a priori* whether to speak of an efficient market

when price differences between this and other countries adequately reflect these insurance costs, or whether to interpret the price differences as indicators of dysfunctional markets. Hence, the minimum achievable costs of exchange are conditional on our specification of the counterfactual, and are inherently ambiguous as a consequence. One might tend to draw the line of interest between unalterably fixed cost factors (such as distance between market locations) and cost factors which are set (and alterable) by humans. The latter comprise aspects such as the endowment with facilities and technology for transport and communication, formal and informal institutions providing legal security and market transparency as well as the existence of norms and skills for market participants to communicate effectively. Moreover, administrative market interventions may form part of the framework conditions affecting the efficiency of exchange. But this distinction is not unambiguous as alterability is in most cases a question of investment, such as construction of the Suez Canal.

Second, there is a major measurement problem: which economic model is appropriate to measure the total costs of exchange and their minimum level, respectively? Given that transaction costs and bounded rationality exist (e.g. for establishing a market in the first place), conditions (and hence indicators) of functioning markets maintained in neoclassical analysis may not be valid. The extensive New Institutional Economics literature discusses and analyses different types of actual market organizations which differ from a traditional perfect ideal but serve economising purposes and evolve to suit social preferences. Furubotn and Richter (2005, 2010) provide comprehensive accounts of the literature on such 'efficiency explanations' of deviations from neoclassical perfect markets. They state '... as a result [of the work of scholars in industrial organisation], "market imperfections" appeared in a new light, not necessarily as forms of monopolistic behaviour but as efficient solutions of the problem of market organization related to transaction costs' (2005, p. 313). In the following paragraphs we examine these efficiency explanations with respect to their relevance for transition economies and agricultural markets, for which aspects of market functioning have been analysed recently in studies such as Brümmer *et al.* (2009), Cechura *et al.* (2014), Djuric *et al.* (2015), Glauben *et al.* (2013), Goychuk and Meyers (2014) or Perekhozhuk *et al.* (2015).

Furubotn and Richter point out that barriers to market entry can be efficient means to protect market making investments from expropriation. They argue that such barriers can be indispensable incentives facilitating the establishment of market organisation. If, for example,

the establishment of systems of quality certification and other screening mechanisms are costly and are not provided by the state, it is beneficial if at least some associations of market participants invest in such systems. However, they can only be expected to do this if they can – at least for some time – exclude freeriders from using these systems. This argument is particularly relevant for agricultural markets of transition countries as institutional framework conditions, e.g. financial market legislation and official standardisation systems, are less advanced than in long established market economies.<sup>2</sup> Consequently, high degrees of integration (agro holdings or relational networks excluding outsiders) which are inconsistent with neoclassical concepts of perfect polypolistic markets can be efficient forms of market organisation. Resulting rents to private providers can then be well justified from a societal point of view.

Prices above (short run) competitive levels can also be explained as efficient means to save on information costs as they may signal to buyers that suppliers comply with quality standards that are costly to verify. They may hence facilitate resource saving exchange and are not necessarily socially wasteful.

Furubotn and Richter further explain why price rigidity ('sticky prices') can be efficient market solutions when menu costs are high: non-price adjustments in response to changed scarcity situations can be preferable to frequent price changes as stable prices can increase trust among trade partners and provide an incentive for maintaining relational contracts. Price rigidity is not a typical phenomenon on markets for (unprocessed) agricultural commodities as relatively elaborated quality classification systems and efficient market information and trading systems have emerged to reduce menu and other adjustment costs in the face of weather driven supply volatility. However, some of these institutions are less developed in transition countries rendering sticky prices more likely there (Rozelle and Swinnen, 2004). Moreover, sticky prices frequently found for consumer food products are likely to be in part transmitted upstream to commodity markets. Consequently, efficient commodity markets are not necessarily characterised by rapid commodity price transmission between locations.

Finally, aside from these conceptual and economic considerations suggesting why distinction between functioning and non-functioning markets is not straightforward, we

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<sup>2</sup>In their chapter 'Liberalization and the development of market institutions' in transition countries, Rozelle and Swinnen (2004) and Swinnen and Rozelle (2006) point out that market-supporting institutions, e.g. to enforce contracts, distribute information, and finance intermediation have emerged only slowly – organised around former structures or promoted by foreign investors or other market participants.

should also keep political aspects in mind. Beyond economic justifications of deviations from neoclassical concepts of functional markets we may argue that minimisation of total costs of exchange should not exclusively serve as guideline for market organisation, and hence for classifying markets as functioning or non-functioning. It is commonplace that societal desirability should not be defined on minimised costs of exchange alone and this needs to be acknowledged at least when conclusions are drawn from economic analyses. But societal desirability itself is ambiguous, and depends on political preferences. An important motivation for the integration of Central and Eastern European countries into the EU (EU eastern enlargement) has been to promote political and social stability in transition economies and promote peace. The long tradition of economic sanctions is another example, depending on the political position judging sanctions as societally beneficial.

Despite the ambiguity of theoretical concepts of market functionality and despite the wide range of aspects discussed to amend neoclassical approaches, rigorous empirical analyses of price formation issues (as provided in this feature) are useful and necessary as they can help to identify obstacles to exchange which policy could help to remove in the drive for economic development. Three approaches to detect market dysfunctionality in terms of non-exploited potentials for exchange of goods are: (i) measuring the result of exchange, i.e. check the relationship between prices in different markets for compliance with the (weak) Law of One Price; (ii) assess existence of prerequisites of functioning markets, e.g. the prevailing type of market, existing infrastructure and institutions; (iii) inquiries about the subjective perception of freedom to transact among agents involved in the markets and among experts.<sup>3</sup>

As minimum trade costs can rarely be measured reliably (even aside from the conceptual difficulties mentioned above) many studies facilitate tests of the Law of One Price by making assumptions regarding statistical properties of trade cost variables and market price formation. The assumption that transaction costs are more stable than price formation on (individual) markets allows verification of market integration (and price transmission) by discriminating statistically between a stable relationship between prices in different markets and independent price fluctuations around this stable relationship. Various versions exist, corresponding to different assumptions about the size of transaction costs (e.g. as linear or nonlinear functions of quantity, value or prices of traded goods). Götz *et al.* (2016) in this

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<sup>3</sup> Other indications of functioning markets are also being considered in studies, such as trade volumes and frequency of transactions.

special feature provide an example of this strand of literature, showing that quantitative findings are often consistent with qualitative information on the nature and specificities of markets in different regions (of Russia in this case). This can compensate to a considerable extent for concerns with this approach, which estimates a substantially reduced form (specified on prices only) to model markets, without accounting for the transactions costs, which are a crucial part of the theoretical model of market integration.

## **2 Examples from transition country and world markets**

So we surely can and should address the question posed in the title and analyse the functioning of markets and its development over time, particularly as substantial new forces are likely to impact on world agricultural markets since emerging transition countries became major market participants. Several studies presented during the IAMO forum and particularly those selected for this special feature provide examples of how innovative approaches can address the difficulties above, at least partially.

Emerging economies, particularly the transition countries of the former Soviet Union and its satellites and China, have assumed different roles in global agricultural markets in the past decades. They have assumed prominent positions in the global division of labour and this process is still ongoing. China has become a big consumer of agricultural bulk commodities, particularly feedstuffs for its surging livestock production for domestic demand, while it has become a major supplier in some niche markets for specific types of seafood, vegetables and fruit. Russia, Ukraine and some Central Asian countries are integrating in world agri-food markets, particularly as suppliers of grains. Assessment of the functioning of markets in this context means analysing the price and trade effects of these changes.

Finally, an important branch of market functioning analyses (also addressed in this special feature) is the assessment of market responses to administrative interventions by governments. We frequently find striking discrepancies between effects mentioned by politicians as motivation for, say, trade restrictions and the effects they actually have through the responses of markets.

The issues outlined above were discussed during the IAMO Forum and are reflected in the papers in this special feature. Three papers address issues of food security, commodity price trends and price turbulences, which are of great current concern.

The first paper (Brümmer *et al.*, 2016) is motivated by recent price spikes: are they nervous overreactions or a sign of efficient markets? Do fundamentals of the real economy fluctuate to an extent unknown before or is it monetary policy and (global) finance that generate strong price volatility? The authors conduct a comprehensive price volatility assessment for the world market of oilseeds and vegetable oils. Their major innovation is that they propose a new estimation procedure that combines a volatility spillover analysis with a structural model approach. Through the combination of both approaches, the authors can simultaneously analyse the major drivers as well as the dynamics of price volatility. The new approach is based on a two-stage estimation procedure: in the first stage, monthly price volatilities are estimated using a standardised GARCH model; and in the second stage, a VAR model is applied to the estimated volatilities. Empirical results for the oilseeds and vegetable oils market reveal that, in particular, exchange rate volatility is a major driver of price volatility; where a statistically significant impact is found, exchange rate volatility turns out to be driving price volatility upwards. Volatility dynamics on the vegetable oils market are largely driven by volatility on the palm oil and soybean oil market. However, the major insight is that price volatilities on the oilseeds as well as the vegetable oils market are largely driven by factors specific to each market. This implies that policies to help producers and consumers cope with price volatility on agricultural commodity markets are more promising than policies that try to curb price volatility.

The second paper questions the popular concern that consumers are in a headlock by those controlling commodity supply. Baffes and Haniotis (2016) examine the main drivers of long-term agricultural commodity price movements during the last six decades, i.e. 1960–2014. Contrary to previous analyses, the authors' analysis is based on a multi-dimensional approach to identifying the main drivers of agricultural commodity prices. Uni-dimensional approaches have the disadvantage that they (usually) overestimate the explanatory power of single price drivers (e.g. biofuel policies). The reduced-form econometric model applied by Baffes and Haniotis accounts for macroeconomic variables as well as sectoral variables. The econometric results for six major crop commodities reveal that energy prices matter most for the movement of prices, followed by stock-to-use ratios and, to a lesser extent, exchange rate movements. Moreover, the results reveal a long-term deterioration of the sectoral terms of trade in agriculture, consistent with the Prebisch-Singer hypothesis.



Uhl *et al.* (2016) also address price formation but have a more specific focus: they analyse the pricing behaviour of Russian grain exporters during the onset of recent developments of political polarisation and dislocations in commodity price ratios. They focus specifically on Russia, which has emerged as an important wheat exporter in recent years while the Russian wheat export market is also highly concentrated. This has raised concerns about Russian wheat exporters' ability to exercise market power, especially in countries that are highly dependent on Russian wheat. Azerbaijan, Armenia and Georgia for example import between 41% and 90% of their total wheat consumption with around half of total imports coming from Russia. Thus, the authors analyse the exertion of price discrimination by Russian wheat exporting firms, applying Knetter's panel model to a unique firm-level dataset. They generate estimates over two different time periods, 2002–2011 and 2006–2011, i.e. the period of high world wheat prices. Their estimation results contradict the hypothesis of an integrated world market with evidence of price discrimination in 25 of 61 destination markets in the longer period and 14 of 49 export markets in the shorter data period. They conclude that the detection of pricing-to-market in international wheat trade is bad news for global food security. In addition, they find a positive exchange rate elasticity, which implies an additional source of volatility in the wheat import price, which is particularly important for unstable economies with highly volatile exchange rates.

The last two papers in the special feature deal with government interventions in international agricultural trade: they investigate both explicit and implicit motivations for trade interventions and their effects as well as attempts to avoid a spiral of protectionism through multilateral agreements.

Götz *et al.* (2016) analyse the performance of Russian and Ukrainian wheat export quotas, export taxes and temporary export bans against the objective announced by the governments of protecting consumers from excessive food prices. As these export controls were typically imposed during times of harvest failure it is not trivial to disentangle trade policy effects and domestic market effects. In their price transmission framework the authors account for such confounders and also for domestic interregional trade flows triggered by the export restrictions. They find non-negligible price effects of trade policies in some Russian regions, though pass-through to retail prices of consumer food products is likely to be small even there. Economic costs of export restrictions are considerable in terms of additional risk factors and scale effects foregone, which discourage production and may eventually affect food security.

While statistical policy analysis tools were applied in the first four papers to address particular research questions, a methodological aspect is the focus in the final paper in this feature. Anderson *et al.* (2016) address long-term projections of trade-related policies and their welfare effects, i.e. a particular aspect of trade policy analysis. The authors note that, in baseline projections of sectoral and general equilibrium models, it is typically assumed that policy regimes and protection levels are fixed over the projection period. However, this assumption is not realistic. Developing and emerging countries change their agricultural and trade-related policies considerably in the course of economic development, encouraged by both internal and external forces. As an alternative to the typical ‘status quo approach’ the authors suggest that domestic agricultural and other policies should be endogenous. They estimate projected price distortion rates for 10 agricultural products and for 39 developing countries up to 2030. Using the GTAP model, they show that employing baseline scenarios with endogenised trade policies avoids substantial underestimation of potential welfare effects of trade agreements. Consequently, more realistic baseline scenarios serving as the counterfactual for trade policies improves the quality of policy analysis and hence policy advice. Better multilateral trade agreements may result where optima are not reached in decentralised processes.

### 3 Outlook

The papers in this special feature can only cover a fraction of the issues with the functioning of agricultural markets, though they are illustrative of topics and regions, commodities covered and methodological approaches. An issue not addressed directly in this special feature is the distribution of benefits from functioning trade (although Baffes and Haniotis indicate clear distributional implications as theoretically expressed in the Prebisch-Singer hypothesis). Distributional issues between sellers, buyers and non-participants are often of particular political concern, and prompt policies which often have unanticipated or undesirable effects (as illustrated by Uhl *et al.*, 2016). Distributional issues are frequently discussed in contexts of market power but arise more generally through structural change both within industries and international trade patterns and globalisation.

There are also wider effects of trade and market policies which are important in the socio-political determination of appropriate policies. Effects of market exchange and trade are not limited to welfare triangles. Social evaluation of market exchange and trade needs also to

include aspects of environment, health, culture and other quality of life dimensions. Furthermore, better functioning markets and improved communication and mutual understanding are two sides of the same coin, neither can happen without the other, and both offer perhaps the only reliable route to human progress and prosperity, as our collective histories demonstrate. While these more general aspects are not topics of our special feature nor of the IAMO Forum, they may be regarded as building blocks, perhaps corner stones of improved international understanding and should not be overlooked. Developments in recent years with intensified conflicts and international confrontation in several world regions have entailed profound changes on markets, and agricultural markets were among the first to be affected. Conversely, reductions in conflict and confrontation require increased market integration and functionality.

Thorough and innovative research related to these aspects can help design ways of organising market relationships and trade in agriculture and food in beneficial ways beyond the scope of this special feature. Nevertheless, the studies presented here contribute new insights into price formation and policy impacts on international agricultural markets with a focus on the role of emerging and transition economies. We hope that this special feature will help to better understand them.

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