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Price transmission between world food prices and different consumer food price indices in Thailand

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Abstract

This paper studied the extent and degree to which world food price indices (*wp*) are transmitted to consumer price indices (*cp*) that describe the food expenditure incurred by the average consumer (NCF), the low-income consumer (LCF), and consumers located in rural areas (RCF) of Thailand. The findings showed that all *wp* were co-integrated with domestic ones, and that the speed of adjustment was similar in all models regardless of the *cp* used. Furthermore, both the long-run and short-run price transmission elasticity of a change in *cp* in response to *wp* were similar when NCF and LCF were included in the error correction models, but were considerably higher when RCF was taken into consideration. Such findings indicate that, within the context of Thailand, study of the impacts of world food prices on the welfare of low-income consumers can be assessed using consumer price indices that are based on food baskets of the general consumer. However, general consumer food price indices do not reflect the effects that changes in world food prices have on the prices of food commodities in rural areas of Thailand.

Introduction

The 2006–2007 food crisis was a phenomenon that exposed the importance of investigating food prices, food price volatility, and food security, and as a result has led to a closer monitoring of food price levels as well as their transmission along the supply chain (OECD, 2015). These concerns are not only limited to developed countries—where food prices increased more than the overall consumer prices in OECD countries during and after the food crisis (McCorriston, 2014)—but also in developing countries, where food prices in domestic markets have been observed to increase in response to increases in world food markets. Furthermore, the increased push for developing countries to participate in global markets through liberalization of domestic food markets has been said to further strengthen market integration and the transmission of prices between world and domestic food markets (Baffes & Gardner, 2003; Baquedano, Liefert, & Shapouri, 2011; Minot, 2011). For such reasons, the degree and extent to which price signals are transmitted from world food markets to domestic ones in developing countries have been of special interest.

Examples of studies assessing price transmission between international and domestic food markets can be found in Baquedano and Liefert (2014) and Minot (2011). They claim that there is evidence of a long-run relationship between world and domestic food prices of several developing countries. However, they pointed out that the degree of price transmission between these markets was not high. It is important to note that not all developing countries are affected to the same degree by shocks in world prices. For

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instance, Conforti (2004) found that price transmission between world markets and domestic markets in African countries was relatively smaller than those in Asian and Latin American countries. Baquedano et al. (2011) also found similar results, where a Latin-American country that had experienced market liberalization had a higher degree of integration to world food markets than its counterpart in Africa.

The aforementioned studies were limited in that price transmission and market integration were only investigated using the world and domestic prices of specific food markets. Therefore, the effects of variations in world food prices on a country's consumer welfare were not investigated. Garcìa-German, Bardajì, and Garrido (2015) addressed this issue by using price indices instead of the prices of specific goods, since the later would only reflect the price dynamics between consumer prices and the international prices of a particular agricultural commodity and the former reflects the changes in the overall price levels of a group of commodities as a result of changes in international markets. They found that consumer welfare in low-income EU countries was most affected by fluctuations in the world prices since these countries had the largest transmission elasticity and spent a larger portion of their income in the purchase of food products.

An issue that has yet to be explored is whether changes in world food prices are proportionally transmitted to consumers of different incomes and in different areas (urban or rural) within the same country. Such effects would be especially significant for low-income consumers because as the income of the consumer falls, the total expenditure on food commodities forms a larger part of the consumer basket costs. Consequentially, increases in food prices have a large impact on health and nutrition especially among the poor (Garcìa-German, Morales-Opazo, Garrido, Demeke, & Bardajì, 2013; Green et al., 2013). Furthermore, low-income households and households located in rural areas spend a greater share of their food expenditure in the procurement of unprocessed agricultural commodities including cereals and other raw agricultural products (Beatty, 2010). Conforti (2004) reported that the prices of staple foods were usually found to be transmitted at a higher degree between world and domestic markets in comparison to processed agricultural products including oilseeds and livestock products, which are more likely consumed by high income earners. What's more, policy makers and government officials often develop policies and monitor changes in food prices using price indices or average prices at the country level. This practice, could show how the general public is affected by increases in food prices. However, it is not known whether such practice would accurately reflect the effects of the increase in world prices on price levels of food products for consumers with different income levels and geographical locations. Therefore, it is necessary to conduct a study that assesses the degree and extent to which price signals are transmitted to different types of consumers.

Evaluating the degree to which international price signals affect the welfare of consumers with different incomes in Thailand is important because despite having a strong economic growth during the last three decades, poverty and income inequality are still major challenges. The World Bank's economic overview of Thailand reported that as of 2013, over 80 percent of the country's poor live in rural areas, and an estimated 6.7 million people live within 20 percent above the national poverty line (World Bank, 2016). This fact, coupled with the findings of high degree of price transmission running from world to domestic markets of staple foods, may indicate that the welfare of low-income households may be more affected by variations in world prices than in other households. Therefore, the aim of this paper was to evaluate the extent and degree to which world food prices are transmitted to different types of consumers in Thailand through the use of price indices that represent the food basket costs faced by the average Thai household, households with low income levels, and those located in rural areas.

Methods

Data and Time Series Properties

Monthly consumer food price indices (*cp*) from Thailand used in this study included the national consumer food and non-alcoholic beverages price index (NCF), the low income food and non-alcoholic beverages price index (LCF), and the rural consumer food and non-alcoholic beverages price index (RCF). These price series spanned from January 1995 to November 2015 and were extracted from the Bureau of Trade and Economic Indices of Thailand (BTEI). A limitation of this study was that the BTEI does not collect and disseminate price indices that describe the price levels faced by consumers in urban areas and by high-income consumers, which is why NCF is included as a proxy in this study. In turn, LCF and RCF were used to describe the level of prices in commodities usually consumed by low income people. In turn, two indices gathered by the International Monetary Fund (IMF)—the world food and beverage price index (WFB) and the world food price index (WFI)—were used to describe world food prices (*wp*). The nominal effective exchange rate (NEER) and the real effective exchange rate (REER) were extracted from the Bank of Thailand (BoT). NEER and REER are variables that measure a local currency's value against a weighted average of currencies from major trading partners. The world oil price index (OIL) was extracted from the IMF. OIL is the simple average of three spot prices—UK Brent, West Texas Intermediate, and the Dubai Fateh.

The time series properties of the data series (in logarithmic form) used in this study were conducted prior to examination of market integration and price transmission. Finding the order at which data series are stationary is important since inclusion of non-stationary data in regression analysis would lead to spurious results. Therefore, Augmented Dickey and Fuller (1979, 1981) and Phillips Perron (1988) were used to determine the order at which all variables were stationary. If the results of the unit root tests show that a set of price series are non-stationary at level, but stationary at first difference, then there exists the possibility that these variables are cointegrated. Cointegrated price series are important for this study since, as will be explained in the econometric specification, they would

allow the study of market integration and price transmission. Therefore, cointegration between world and domestic food prices was investigated using Engle–Granger's cointegration test (Engle & Granger, 1987).

Econometric Model Specification

Market integration and price transmission from world food markets to domestic ones in Thailand can be investigated based on the Law of One Price (LOP) (Fackler & Goodwin, 2001). The LOP states that arbitrage allows for the prices of markets connected by trade to be the same after adjusting for transaction and transportation costs (Vinuya, 2007). Study of the LOP would require that price transmission between domestic prices and world prices be modeled according to Equation (1):

$$cp_t = \alpha + \beta wp_t + e_t \quad (1)$$

where cp_t is the consumer food price index in question and wp_t is the world food price index. As stated in the data section, both cp_t and wp_t were transformed into logarithmic form, which allows for the interpretation of β coefficient as the long-run price transmission elasticity of a change in *cp* in response to a change in *wp*. The presence of a long-run relationship between *cp* and *wp*, would require that the residual *e* be stationary at the level. Inclusion of the residual into Equation (1) would help discover and discern the short-run causal effects from the long-run causal effects between *wp* and *cp*. Such inclusion would modify Equation (1) into an error correction model (ECM) of the form shown in Equation (2):

$$\Delta cp_t = \alpha + \varphi \Delta wp_t + \gamma ect_{t-1} + \varepsilon_t \quad (2)$$

where Δ is the first difference operator, φ is the short term price transmission elasticity of a change in *cp* to a change in *wp*, the error correction term ect_{t-1}, is the lagged stationary residual of the regression of Equation (1), and γ is the speed at which this bivariate system will return to equilibrium after a change in *wp* (De Boef & Keele, 2008).

Transmission of world price signals to domestic markets is not instantaneous, especially in food markets. The impact of changes in food prices in world markets may take a number of months to be observed in domestic food markets. Furthermore, the lagged prices of domestic food markets may also impact their own prices in the future. For such reasons, the ECM in Equation (2) was transformed into an autoregressive distributed lagged model of the form shown in Equation (3):

$$\Delta cp_t = \alpha + \sum_{i=1}^{k} \alpha_i \Delta cp_{t-i} + \sum_{i=0}^{l} \varphi_i \Delta wp_{t-i} + \gamma ect_{t-1} + \varepsilon_t \quad (3)$$

It is important to note that the autoregressive distributed lag (ARDL) model in Equation (3) takes the form of a parsimonious single ECM. Modeling price transmission using this type of model does more than just describe the long-run equilibrium and short-run price dynamics between international and domestic food prices (Baquedano et al., 2011), as it also allows the researcher to assume that causality runs from international food prices to domestic ones, which is especially important when using aggregated price levels instead of specific commodity prices, because a strong argument is presented in the literature that *wp* has an effect on *cp* (Garcìa-German et al., 2015), but not the other way around. Therefore, this approach would allow for the investigation of price transmission between world food price indices to domestic food prices in Thailand. Furthermore, including different types of *cp* in Equation (4) would allow the researchers to assess the extent and degree to which international food price indices affect the *cp* of different types of consumers with different patterns of expenditure on food commodities, and by extension, to determine whether changes in world food prices equally affect the consumer food prices of different types of consumers. For this reason, the Engle–Granger ECM would be the most appropriate approach to measuring the extent and degree of price transmission between *cp* and *wp*.

A caveat on directly estimating price transmission between world and domestic food prices using Equation (3) is that it does not include the effects that supply and demand shifters may have on the domestic prices of agricultural commodities. Gilbert (2010) noted that these shifters do have a role to play in the price dynamics of aggregated food price indices. Therefore, modeling the price dynamics between *cp* and *wp* might be inaccurate if supply and demand shifters were not included in the model. For this reason, the price transmission model in Equation (3) was augmented by adding the exchange rate and world oil prices. It is worth mentioning that there are other factors that have been posited as important supply and demand shifters. However, inclusion of these variables is limited since datasets of these variables are often not available on a monthly basis. For this reason, the exchange rate and oil price indices were included as exogenous variables in the ARDL model shown in Equation (3) yielding Equation (4):

$$\Delta cp_t = \alpha + \sum_{i=1}^{k} \alpha_i \Delta cp_{t-i} + \sum_{i=0}^{l} \varphi_i \Delta wp_{t-i} + \sum_{i=0}^{m} \beta_1 \Delta e_{t-i} + \sum_{i=0}^{n} \beta_2 \Delta o_{t-i} + \gamma ect_{t-1} + \varepsilon_t \quad (4)$$

where *e* and *o* are variables used for exchange rate (NEER and REER) and world oil prices respectively. It is important to note that much like Equation (3), Equation (4) takes the form of a parsimonious model. In order to specify such a model, Garcìa-German's et al. (2015) approach was used, which consists of adding and subtracting the lags of the exogenous variables in Equation (4), and then deriving the parsimonious model by eliminating the insignificant lags of the exogenous variables from the regression. However, the lag was not eliminated from the regression if the inclusion of such lag yielded a more optimal Akaike information criterion (AIC).

Returning to the relationship between agricultural commodity prices and the exchange rate, in the literature, exchange rates are found to affect the prices of agricultural commodities (Bradshaw & Orden, 1990; Harri, Nalley, & Hudson, 2009). Furthermore, changes in macroeconomic policies related to the value of the currency may lower the

speed at which price signals are received in domestic markets. The inclusion of such effects is imperative in Thailand because major fluctuations in the exchange rate may result from developments within a floating exchange rate system and variations in the macroeconomic variables (Baquedano & Liefert, 2014). On the other hand, Gilbert (2010) maintained that similar to other demand shifters, variations in the exchange rate cause a common shock that will predominantly affect the aggregate price indices.

Another factor that is important to discuss is the costs related to agricultural production. Baquedano and Liefert (2014) considered that costs including processing and retail costs are likely to affect domestic prices of agricultural products. If production and retail costs form a larger percentage of the total costs of an agricultural commodity, then price changes of the product might be more responsive to retail and production costs. As important as it is to include retail and marketing costs into the study, it is often the case that data on these costs is not available. Therefore, retail and processing costs are replaced by crude oil prices (Leibtag, 2009). Furthermore, the use of oil prices as a supply shifter may be more appropriate for this study since price indices and not the prices of specific agricultural commodities were included in this study. Gilbert (2010) reported that at an aggregate level, oil prices may have a considerable impact on agricultural prices since an increase in oil prices may lead to higher production costs.

Results and Discussion

Time Series Properties and Cointegration Tests

The results of the unit root tests are shown in Table 1. The findings suggested that all price indices used to represent Thai and world food markets are characterized by a I(1) process. Therefore, all the aforementioned data series can be used to test for the existence of a long-run relationship between world and Thai food prices. Furthermore, findings from the unit root tests also indicated that both time series data used to represent the exchange rate in Thailand (NEER and REER) as well as the oil price indices were also found to be non-stationary at level, but stationary at first difference.

The two step Engle—Granger tests were performed to find evidence of cointegration between *wp* and *cp*. Cointegration between a set of time series data points to the existence of a linear combination of variables that are stationary at order zero. To test for cointegration, Engle—Granger's test starts by first regressing one price series on another price series (in this case *wp* on *cp*), and then performing unit root tests on the residuals obtained from the regression. If the residuals are found to be stationary at levels then the variables at study are said to be cointegrated, and therefore, can be used as an error correction term in the ECM shown in Equation (4). The cointegration tests showed that all the time series used to represent domestic food price indices in the Thailand data (NCF, LCF and RCF) are cointegrated with both WFB and WFI (Table 2).

Table 1
Augmented Dicky Fuller (ADF) and Phillips-Perron (PP) unit root test results

Variable	ADF		PP	
	Level	First difference	Level	First difference
NCF	−1.571	−11.684*	−1.368	−11.612*
LCF	−1.583	−11.541*	−1.407	−11.458*
RCF	−1.484	−11.482*	−1.513	−12.171*
WFB	−2.086	−9.944*	−1.853	−9.954*
WFI	−1.222	−9.990*	−1.838	−9.971*
NEER	−2.627	−12.534*	−2.368	−12.484*
REER	−2.658	−13.121*	−2.273	−13.040*
OIL	−1.702	−11.939*	−1.574	−11.924*

Note: Single asterisk denotes significance at 5% level. The critical test value at 5% level for the ADF test and the PP test is −3.428

Price Transmission and Market Integration Between wp and cp

Table 2 also provides a preliminary view of the extent to which world prices signals are transmitted to domestic ones. Since the econometric models were estimated using data series in logarithmic form, the coefficient β is the long-run price transmission elasticity of a change in *cp* in response to a change in *wp*. The coefficients β for the bivariate model RCF-WFB and RCF-WFI are close to one, which provide an indication of market integration and complete pass-through of world prices to domestic food markets. In contrast, the long-run price transmission elasticity of NCF and LCF in response to a change in *wp* (both WFB and WFI) were observed to range between zero to one, which was in line with Garcìa-German et al.'s (2015) findings. Moreover, the long-run price transmission elasticity was larger when considering the effects of *wp* on rural households (RCF) in comparison to other *cp* used in this study. This indicates that world prices would impact rural households to a higher degree in comparison to urban households, which could be related to the larger expenditure of rural households on staple foods and fresh agricultural products. However, these findings should be applied with caution since they do not reflect the effect that supply shifters may have on the price transmission.

The short-run elasticities of price transmission between domestic food prices and world food prices are shown in Tables 3 and 4. The difference between these tables is that Table 3 contains the coefficients of the ECM using WFB as *wp*, while Table 4 contains the coefficients of the ECM using WFI. The results shown in both tables are quite robust, with the difference being that the transmission elasticities of changes in *cp* from a change in WFI are slightly smaller than the corresponding elasticities in ECM using WFB. Garcìa-German et al. (2015) also reported similar findings where different indices used as *wp* had different impacts on *cp* in European Union countries. They noted that the differences were brought about by the different coverages and weighting methods used to construct the world food price indices. In the current study, WFB is an aggregate of the prices of agricultural commodities and beverages like coffee and tea, while WFI is only an aggregate of agricultural commodities, which could explain the minor differences in the price transmission elasticities in Tables 3 and 4.

Based on findings shown in Tables 3 and 4, it could be concluded that both price indices (WFI and WFB) used as

Table 2
Engle–Granger cointegration analysis

cp	*wp*	Long-run regression				Engle–Granger cointegration	
		A	β	R^2	AIC	ADF test on residuals	*p*
NCF	WFB	0.721	0.752*	0.676	−0.965	−2.270	.028
	WFI	0.711	0.755*	0.680	−0.976	−2.155	.030
LCF	WFB	0.543	0.786*	0.681	−0.898	−2.229	.025
	WFI	0.533	0.789*	0.684	−0.908	−2.117	.033
RCF	WFB	0.771	1.040*	0.698	−0.417	−2.185	.028
	WFI	−0.780	1.044*	0.699	−0.424	−2.000	.044

Note: Single asterisk denotes significance at 1% level. Engle–Granger cointegration analysis is based on the Augmented Dickey-Fuller (ADF) unit root test on the residuals obtained from the regression $cp = \alpha + \beta wp$ (where *cp* is the consumer food price index in Thailand and *wp* is the world food price index). If the residuals are shown to be stationary at levels, then both price indices are cointegrated

wp have a similar effect on Thai consumer food price indices. Both indices had a positive effect on NCF and LCF that was significant until period *t*-3 ($p < .05$). In contrast, WFI and WFB had a negative effect on RCF in period *t*-1, but had a dominant positive effect in subsequent time periods. Furthermore, similar to the findings shown in Table 2, the price transmission elasticity of a change in RCF in response to a change in either WFB and WFI was slightly higher than the price transmission elasticities obtained in the ECM using LCF and NCF as *cp*. These findings indicated that the consumer welfare of rural households may be more affected by movements in international prices.

The overall findings suggest that price transmission of *wp* to *cp* is slightly higher in the short run and long run when using RCF in comparison to NCF and LCF. A possible explanation for this difference is that RCF was more heavily

Table 3
Estimated coefficients of error correction model using world food and beverage price index as world price (*wp*)

	NCF		LCF		RCF	
	NEER	REER	NEER	REER	NEER	REER
α_i	0.003***	0.003***	0.003***	0.003***	0.005***	0.005***
Δcp_{t-1}	0.227***	0.223***	0.241***	0.239***	0.209***	0.201***
Δcp_{t-2}	−0.180***	−0.175***	−0.174***	−0.167***	−0.179***	−0.173***
Δwp_{t-1}	–	–	–	–	−0.074**	−0.077**
Δwp_{t-2}	–	–	–	–	0.076**	0.075**
Δwp_{t-3}	0.053***	0.053***	0.055***	0.055***	0.064**	0.062**
Δe_t	−0.009	0.015	0.006	0.035*	0.028	0.064*
Δe_{t-1}	–	–	–	−0.024	–	–
Δo_t	−0.001	−0.001	−0.003	−0.003	0.008	0.008
ECT_{t-1}	−0.015***	−0.015***	−0.016***	−0.016***	−0.016***	−0.016***
AIC	−7.045	−7.046	−6.911	−6.920	−5.878	−5.891
$\overline{R}^2$	0.200	0.201	0.202	0.212	0.180	0.190
DW	2.068	2.057	2.058	2.053	2.012	2.007

Note: Single asterisk denotes significance at 10%, while double and triple asterisks denote significance at 5% and 1% respectively. In order to specify a parsimonious model, insignificant lags were eliminated from the regressions. However, the lag was not eliminated from the regression if the inclusion of such lag yielded more optimal AIC scores

Table 4
Estimated coefficients of error correction model (using world food price index as world price (*wp*)

	NCF		LCF		RCF	
	NEER	REER	NEER	REER	NEER	REER
α_i	0.003***	0.003***	0.003***	0.003***	0.005***	0.005***
Δcp_{t-1}	0.235***	0.231***	0.249***	0.246***	0.217***	0.209***
Δcp_{t-2}	−0.183***	−0.179***	−0.177***	−0.170***	−0.187***	−0.180***
Δwp_{t-1}	–	–	–	–	−0.060**	−0.062**
Δwp_{t-2}	–	–	–	–	0.058*	0.057*
Δwp_{t-3}	0.043***	0.043***	0.045***	0.045***	0.050*	0.049*
Δe_t	−0.009	0.016	0.006	0.036*	0.026	0.063*
Δe_{t-1}	–	–	–	−0.024	–	–
Δo_t	−0.001	−0.001	−0.003	−0.003	0.009	0.008
ECT_{t-1}	−0.015***	−0.015***	−0.016***	−0.016***	−0.017***	−0.017***
AIC	−7.031	−7.033	−6.898	−6.907	−5.855	−5.867
$\overline{R}^2$	0.189	0.191	0.192	0.202	0.160	0.171
DW	2.067	2.055	2.056	2.049	2.014	2.009

Note: Single asterisk denotes significance at 10%, while double and triple asterisks denote significance at 5% and 1% respectively. In order to specify a parsimonious model, non significant lags were eliminated from the regressions. However, the lag was not eliminated from the regression if the inclusion of such lag yielded more optimal AIC scores

weighted toward prices of raw agricultural commodities including staple foods, while NCF had larger weights directed to processed food products, which as reported by Conforti (2004), is transmitted at a lower degree between world and domestic markets in comparison to that of staple foods. Furthermore, Lloyd, McCorriston, Morgan, and Zgovu (2012) reported that prices of raw agricultural products are likely to be more volatile than retail prices of processed food products. Therefore, price indices that are more weighted toward raw agricultural products are more likely to be responsive to external shocks. Another explanation could be that a hike in world food prices would be transmitted to food markets in the urban centers, which would divert the flow of food products from rural areas to urban centers and international markets. The deficit of food products in rural areas would then lead to an increase in the overall price levels of food commodities in rural areas. These findings are important because studies that investigate the transmission of price signals between world food markets and domestic ones would use food prices at retail and wholesalers, which are collected in urban centers or are average prices for all the country (or province, state). Therefore, these studies would not fully reflect the price dynamics rural consumers would face after an innovation in world food prices. Consequentially, if the Thai government were to pursue policies that further liberalize the markets based on average consumer food price indices, then these policies would have a detrimental effect on consumers in rural areas.

The estimated parameters of the ECT (or in other terms, the speed of adjustment parameter) are also shown in Tables 3 and 4. The results showed that although the magnitude was small, the estimated parameters of the ECT were significantly different from zero and had a negative sign regardless of which time series was used to describe *wp* and *cp*. Similar findings were reported by Garcìa-German et al. (2015), where the speed of adjustment parameter for several European countries was negative and had a wide array of magnitudes different from zero. These results also provided strong indications of a long-run relationship and a certain degree of market integration between *cp* and *wp* (Baquedano & Liefert, 2014). Furthermore, the parameter ECT had similar magnitudes in all the estimated models, which indicates that after a shock in the world prices, the NCF, LCF, and RCF will return to their long-run equilibria at the same speed.

Turning to the effects that demand shifters have on consumer food prices as well as the transmission of food prices to domestic ones, we observed that the real effective exchange rate had a significant positive effect on food price indices reflecting expenditures of low-income consumers (LCF) as well as consumers living in rural areas (RCF). Several authors including Davidson, Halunga, Lloyd, McCorriston, and Morgan (2011) and Gilbert (2010) noted that food prices increase as a result of a depreciation in a country's currency, which contrasted with our findings. However, some studies have found cases were an appreciated currency does lead to falls in the prices of food commodities in several countries (Baquedano & Liefert, 2014). German-Garcìa et al. (2015) considered that an appreciation of the currency would reduce the impact of higher world food prices on domestic ones, which could explain the positive relationship between food prices and the exchange rate in Thailand.

Similar to Ma, Xu, and Dong (2015), our findings indicated that there was no significant impact of oil price on the food price indices considered in this study. All together, these findings are aligned with Gilbert's (2010) argument, where he stated that demand shifters play a more important role in explaining aggregated price changes, while the impact of changes in supply shifters are more prevalent in specific commodities. If these findings are prevalent at high levels of aggregation (entire food sector), then this argument would be applicable to lower levels of price aggregation (such as cereals, meats, vegetables).

Conclusions

This paper studied the extent and degree to which changes in *wp* are transmitted to the *cp* of different types of consumers in Thailand. The conceptualization of this study originated from the need to evaluate whether the consumer welfare of general consumers, low-income consumers, and consumers residing in rural areas was equally affected by variations in world prices. Overall the results showed that the consumer food price indices of both the average consumer and the low-income consumer were equally sensitive to variations in world prices. Therefore, both price indices could be used to monitor the consumer welfare of general and low-income households living in urban areas. In turn, the food prices faced by rural households were found to be more responsive to changes in world prices. Rural households are said to consume agricultural commodities that are less processed than the products mostly consumed in urban areas, which is why the food price indices for rural areas are more weighted towards fresh agricultural commodities and staple foods. Incidentally, these groups are the ones that are more sensitive to movements in the world prices. Furthermore, rural households might be more prone to changes in world price signals as a result of the food deficits created when increases to domestic food prices originating from increases in world food price levels, divert food commodities from rural areas to urban and international markets.

A common approach used to study price transmission from international markets to domestic ones is to observe how food prices at either the retail, wholesale, or producer level react to an innovation in international food markets. However, the data used in such a study typically only include retail prices from major urban centers or, at the best, average retail prices of the country (or province, state). Consequentially, an implication of these findings is that if policy makers push for market liberalization and the integration of world food markets (that is, free trade and economic communities), then the consumers in rural areas would be impacted more as a result of a change in international food markets. Furthermore, the use of retail prices from major urban areas would then not reflect the effects on rural consumers when there is a change in world prices or an innovation within the supply chain. Therefore, further study on the price dynamics between consumer prices in rural areas and those in urban areas is important to help

policy makers understand how both groups of consumers are affected by international prices.

Conflict of Interest

No conflict of interest.

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