



# Research on the effectiveness of import trade policy of wheat flour in Korea

Xing Wang<sup>1a</sup>, Aolei Hu<sup>1b</sup>, Yu Hong<sup>1c</sup> and Aijing Hu<sup>2\*</sup>

<sup>1</sup>Jilin University of Economy and Finance, Changchun 130021, China

<sup>2</sup>Changchun Humanities and Sciences College, Changchun, China

\*Corresponding author e-mail: 106044@jlu.edu.cn  
E-mails: <sup>a</sup>2323247065@qq.com; <sup>b</sup>786581266@qq.com; <sup>c</sup>758899065@qq.com

**Abstract.** This study uses data from 1992 to 2021 to examine the long-run and short-run analysis of Korea's foreign trade policy and wheat flour import trade, and finds that there's a cointegration relationship between Korea's wheat flour import comparative advantage and import intervention policy. After HP filter, the results of Granger test show that the import policy is a short-run Granger reason for comparative advantage, and the effect is negative. Meanwhile, comparative advantage is a short-run Granger reason for import policy, but its effect is positive. The empirical results show that Korea implement encouragement policy of wheat flour imports. In the short-run, Korea's encouragement of imports isn't conducive to the formation of import comparative advantages, but the formation and development of import comparative advantages are conducive to implement import incentive policies.

**Keywords:** Korea; wheat flour; import; trade policy; comparative

## 1 Introduction

Since World War II, Korea's agricultural production technology and management level are in the forefront of the world [1]. But, its self-sufficiency rate is 45.8%, of which wheat is 0.8%, and it can only rely on imports to meet its own needs.

Existing literatures show that Korea still attaches great importance to protect its own agriculture [2]. But, the literatures lack on Korea's subdivided agro-products. Thus, the paper focus on that whether Korea restricts the import of wheat flour and whether restricting imports can enhance its comparative advantage.

## 2 Data and Indicators

### 2.1 Revealed comparative advantage

Balassa (1965) proposed to use  $RCA_{ck}$  to measure the revealed comparative advantage of product  $k$  in a country's trade [3-5].

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$$RCAX_{ck} = (X_{ck} / X_c) / (X_{wk} / X_w) \quad (1)$$

In equation (1), X means export, c means Korea, w is the world and the k is the product. If  $0 < RCAX_{ck} < 1$ , it indicated that c has a comparative disadvantage in the international division of labor. When  $RCAX_{ck} > 1$ , the meaning is opposite.

$$RCAM_{ck} = (M_{ck} / M_c) / (M_{wk} / M_w) \quad (2)$$

In equation (2), the data is replaced with imported, and the meaning is opposite.

## 2.2 Revealed symmetric comparative advantage

Dalum, Laursen and Villumsen (1998) proposed "Revealed Symmetric Comparative Advantage (RSCA)" [6].

$$RX_{ck} = RSCAX_{ck} = (RCAX_{ck} - 1) / (RCAX_{ck} + 1) \quad (3)$$

In export,  $RX_{ck} \in [-1,0]$  means that country c's product k has a comparative disadvantage;  $RX_{ck} \in [0,1]$  reveals that country c has comparative advantage in k.

The formula for the RSCAM (RM) is similar to RX, but the meaning is opposite. To better compare RM and RX, a minus sign is added to the RM formula for to ensure that the value interval is unchanged, but the meaning is same.

$$RM_{ck} = RSCAM_{ck} = - (RCAM_{ck} - 1) / (RCAM_{ck} + 1) \quad (4)$$

## 2.3 Net Export Ratio

The net export ratio index (NX) is used to determine the international competitiveness of a country's foreign trade in products and is expressed by

$$NX_{ck} = (X_{ck} - M_{ck}) / (X_{ck} + M_{ck}) \quad (5)$$

## 2.4 Policy Intervention Index

The difference between  $NX_{ck}$  and  $RSCA_{ck}$  is the "policy intervention index". [7] If  $HM < 0$ , it shows that the government adopt the import promotion policy.

$$HM_{ck} = NX_{ck} - RM_{ck} \quad (6)$$

# 3 Research results

## 3.1 HM chart

The figure 1 shows that the HM curve has been below 0 since 1992, which indicates that Korea has been implementing a trade policy to encourage imports.

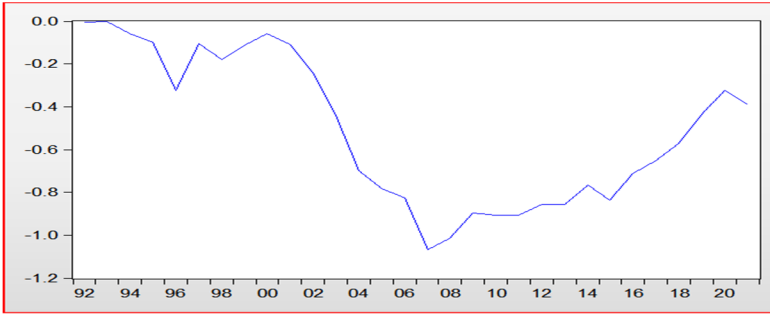


Fig. 1. The curve of HM chart (Source: Data from UN Comtrade Database)

### 3.2 Augmented Dicky-Fuller (ADF) unit tests

Table 1 presents the Augmented Dicky-Fuller (ADF) unit root test results' all steady.

Table 1. The results of the ADF unit root test.

Variable	Test type	ADF	Prob.	Variable	Test type	ADF	Prob.
RM	N, N, 1	-0.821	0.351	$\Delta$ RM	N, N, 0	-3.667	0.001
HM	N, N, 1	-0.417	0.524	$\Delta$ HM	N, N, 0	-4.338	0.000
$\ln(RM+2)$	C, N, 1	-1.826	0.361	$\Delta \ln(RM+2)$	N, N, 0	-3.675	0.001
$\ln(HM+2)$	N, N, 0	-1.147	0.223	$\Delta \ln(HM+2)$	N, N, 0	-4.361	0.000

Note: C is intercept; N is used when there isn't an intercept or trend [8-9].

Source: Data from the UN Comtrade Database and verified by the E-views software.

### 3.3 AR unit Root

In this paper, the stability test of the previously selected VEC optimal model is performed before the long-run Granger causal analysis. The Figure 2 shows that five roots on the circle, so long-run testing isn't possible.

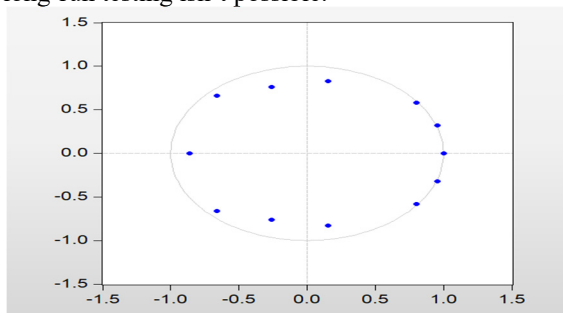


Fig. 2. Inverse roots of AR characteristic polynomial of the optimal VEC model

(Source: Data from the UN Comtrade Database and verified by the E-views software)

### 3.4 HP filter

The HP filter treats the economic cycle as a macro emergency that deviates from the slow-moving path of monotonous growth during this period, and calls it a trend [10].

#### Stationarity test.

Table 2 shows the ADF test results for HP filtered adjusted data, which is distinguished by naming the adjusted data in lowercase.

**Table 2.** The results of the ADF unit root test.

Variable	Test type	ADF	Prob.	Variable	Test type	ADF	Prob.
rm	(N, N, 1)	-2.665	0.010	ln(rm+2)	(N, N, 1)	-2.677	0.009
hm	(N, N, 0)	-2.669	0.010	ln(hm+2)	(N, N, 0)	-2.678	0.009

Source: Data from the UN Comtrade Database and verified by the E-views software.

#### Model selection.

In the table 3, a hysteresis length of 6 is selected for all information criteria, and the comparison nonlinearity assumes optimality. Thus, under HP filtering, the nonlinear is optimal.

**Table 3.** Model selection result.

Model Assumption	Lag	FPE	AIC	SC	HQ
Linear	6	2.71e-05	-5.175	-3.801	-4.810
Nonlinear	6	1.34e-06	-8.182*	-6.808*	-7.818*

Note: "\*" means be selected;

Source: Data from the UN Comtrade Database and verified by the E-views software.

#### Short-run Granger test.

Table 4 shows the short-run analysis results of the linear model after HP filter.

**Table 4.** Short-run Granger causality test results.

Variable	ln(rm+2)			ln(hm+2)		
	Chi-sq	Prob.	S.E.	Chi-sq	Prob.	S.E.
ln(rm+2)	—	—	—	30.075	0.000	3.384
ln(hm+2)	21.622	0.001	-0.244	—	—	—

Source: Data from the UN Comtrade Database and verified by the E-views software.

The results mean that ln(hm+2) and ln(rm+2) both have short-run Granger reasons. The short-run effect is negative for ln(rm+2), but the effect is positive for ln(hm+2).

## 4 Conclusions

In this paper, we drew the following three conclusions:

Since 1992, Korea has been implementing a trade policy to encourage imports.

In the short run, due to the short duration of the policy, the degree of import incentive policies in Korea is different, which has a negative impact on the formation and development of import comparative advantages.

The formation and development of import comparative advantages can enhance industry confidence and facilitate the implementation of import incentive policies.

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