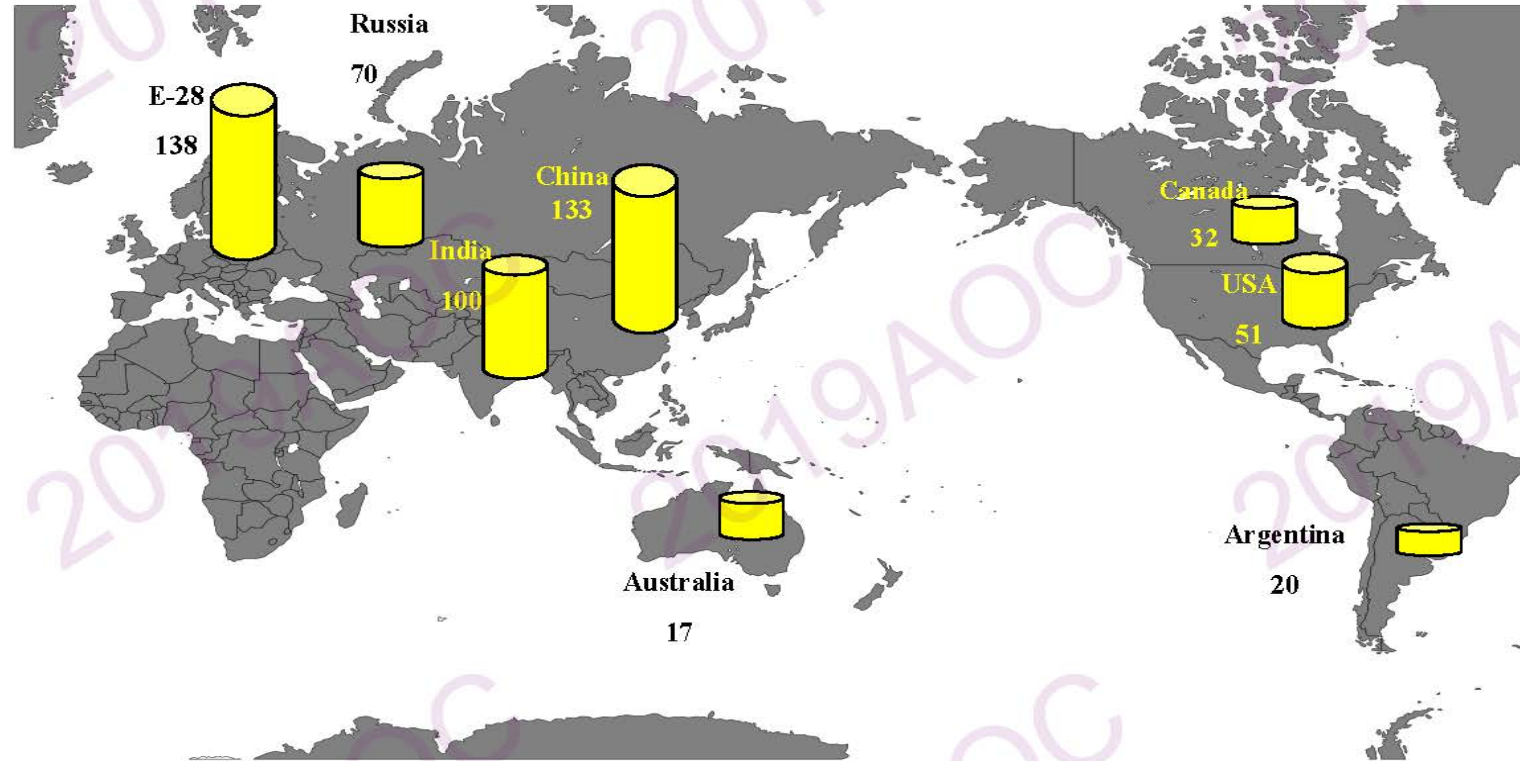


# The Quantitative Economic Analysis of Global Wheat Market Situation and Outlook

Atsuyuki UEBAYASHI (上林 篤幸)

PRIMAFF-Japan (日本国 農林水産政策研究所)

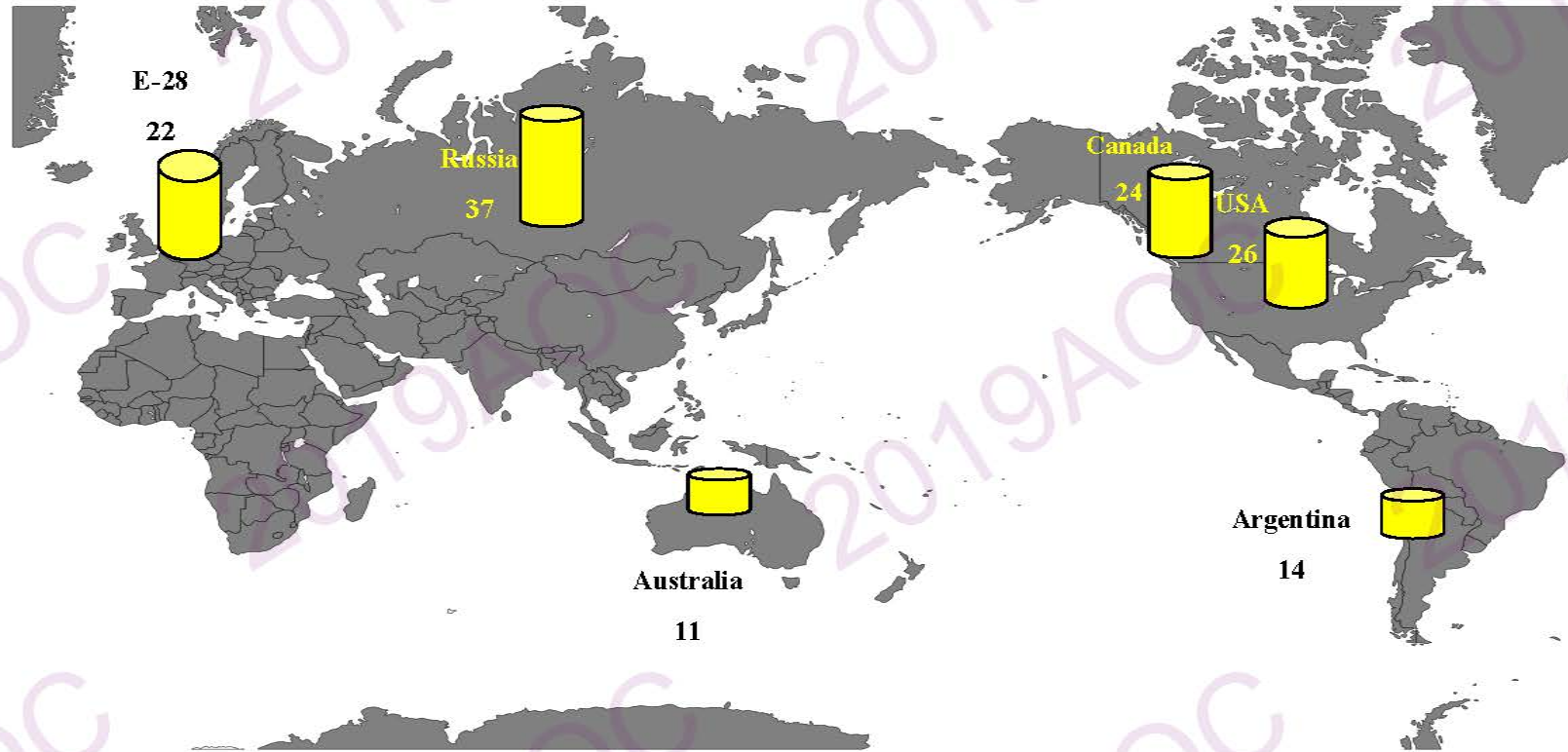
# World Main Wheat Producers ( 2018/19)



Unit: Million Tonnes

Source: USDA PS&D database

# World Main Wheat Exporters (2018/19)

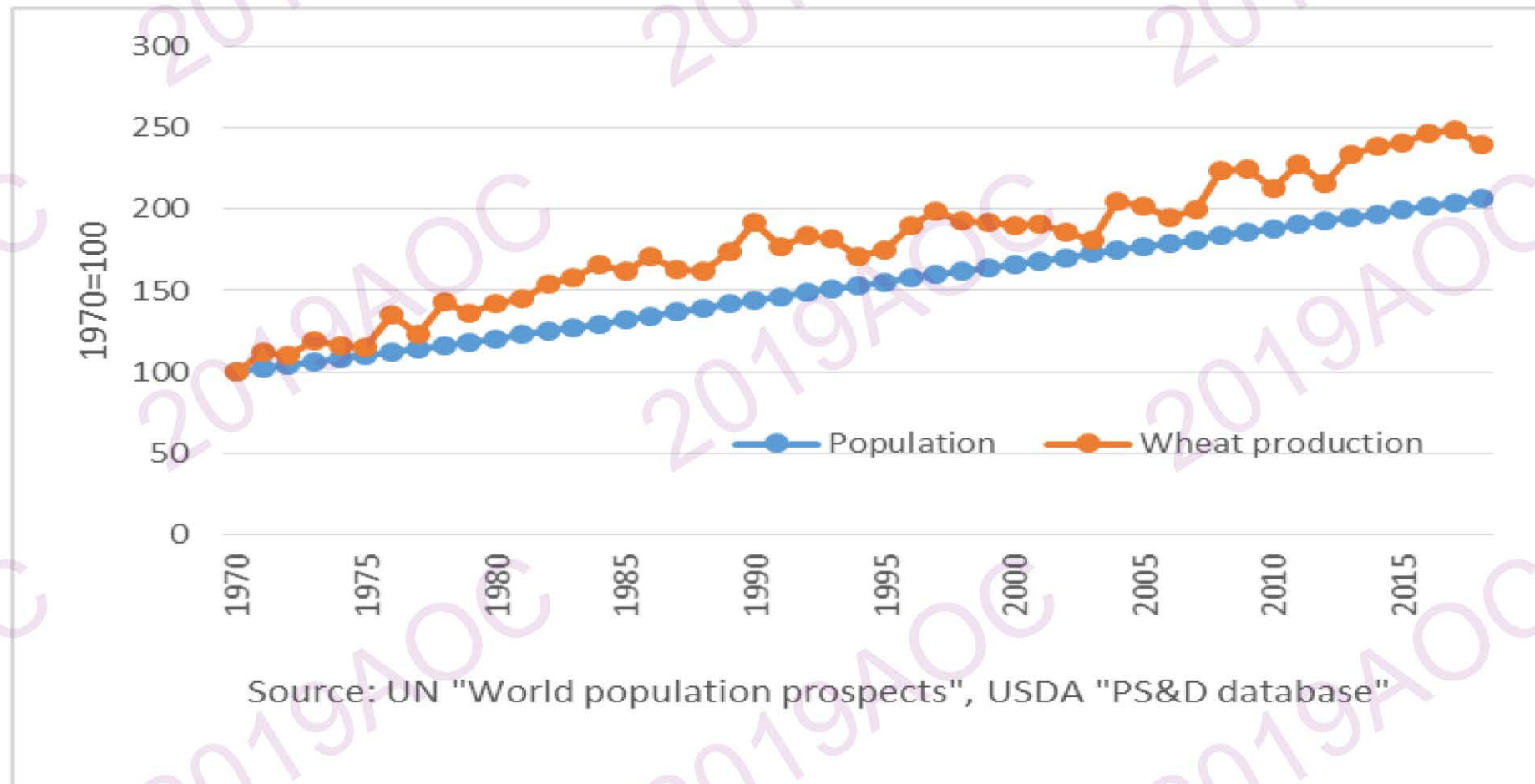


Unit: Million Tonnes

Source: USDA PS&D database






# World Population and Wheat Production Growth - Are People Better Off ? -



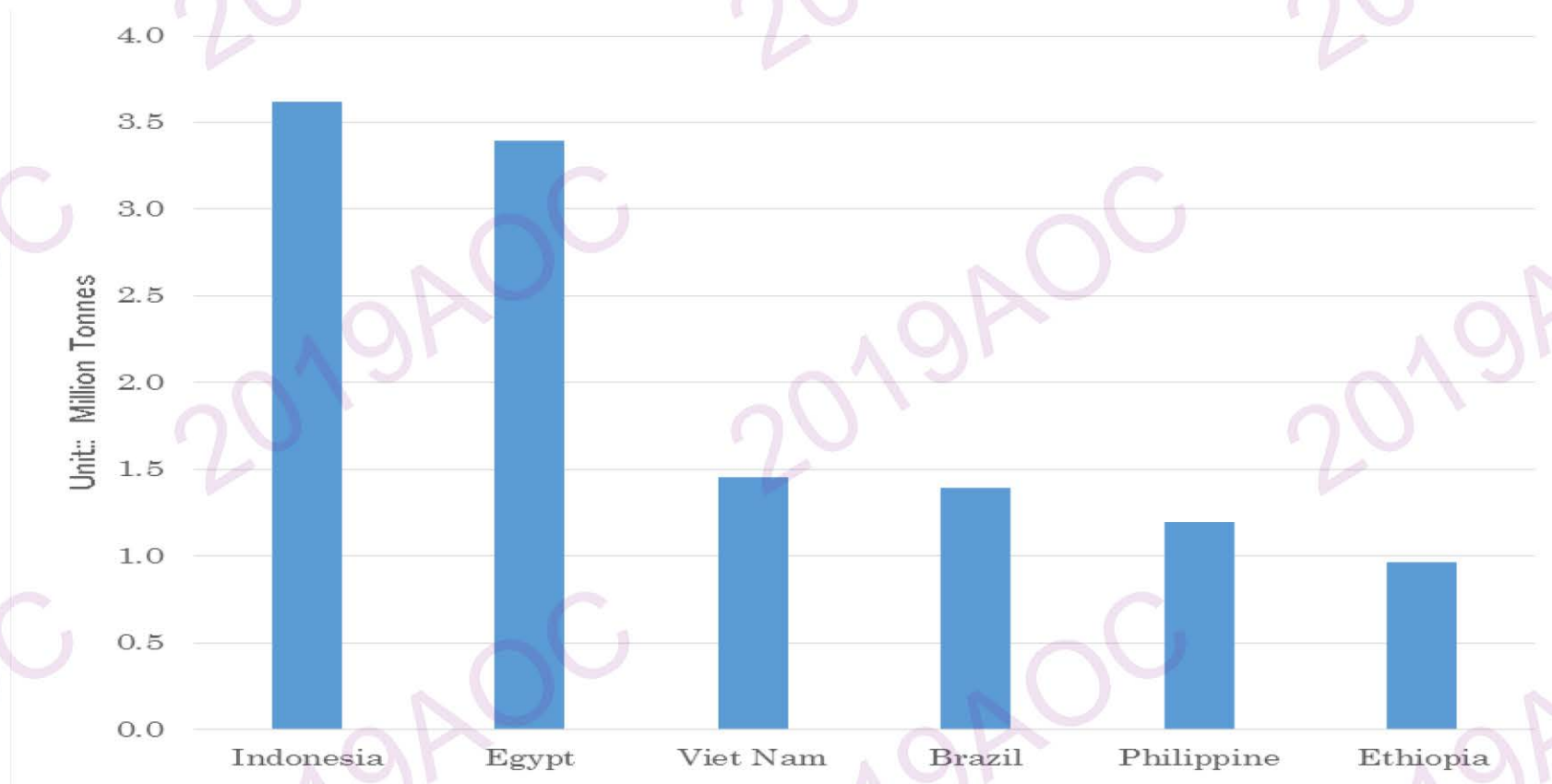
# Quality Difference of Wheat Flour

- Wheat is not same -

	Weak (低筋粉)	Medium (準強力粉)	Strong (高筋粉)
Gluten Contents (%)	7-9	9-12	12-14
Products			

Note: Wheat for strong flour(高筋粉) is produced **mainly Canada and northern US**. Other wheat is produced in all over the world.

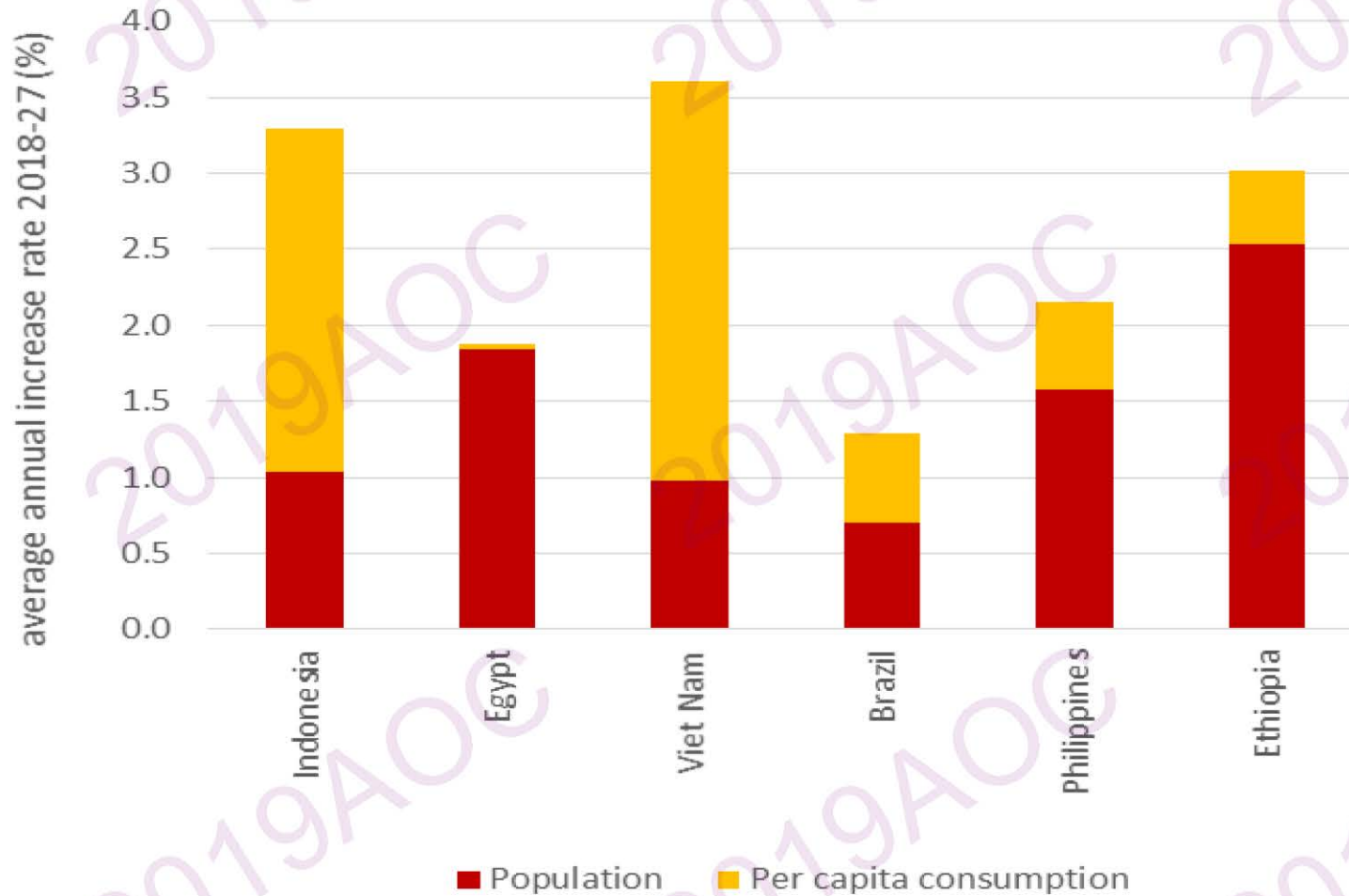
## Growing Market – Middle East and South-east Asia - Import increase quantity in coming 10 years -



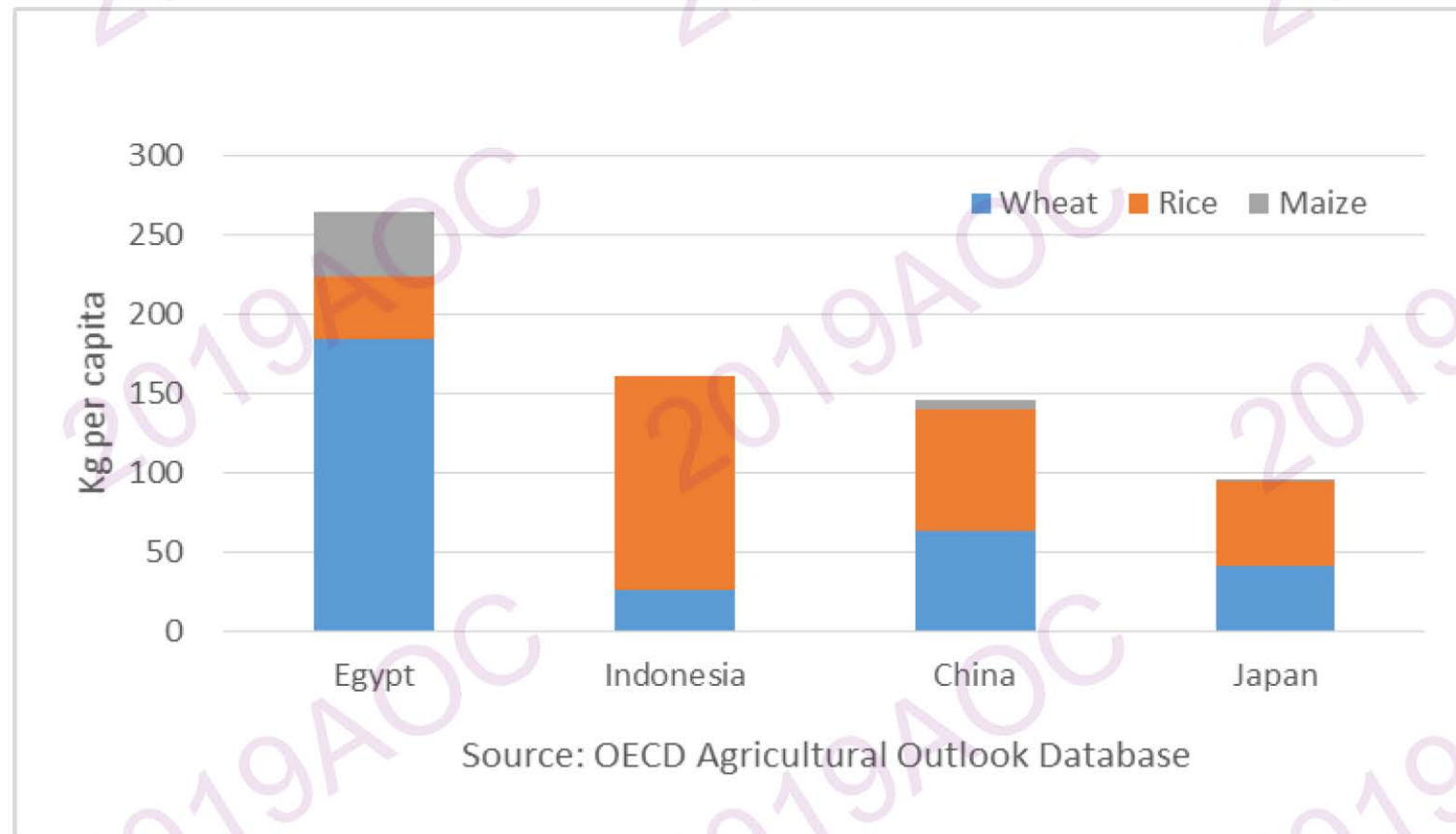
Source: “OECD-FAO Agricultural Outlook 2018-2027”



# Factor Decomposition of Consumption Growth

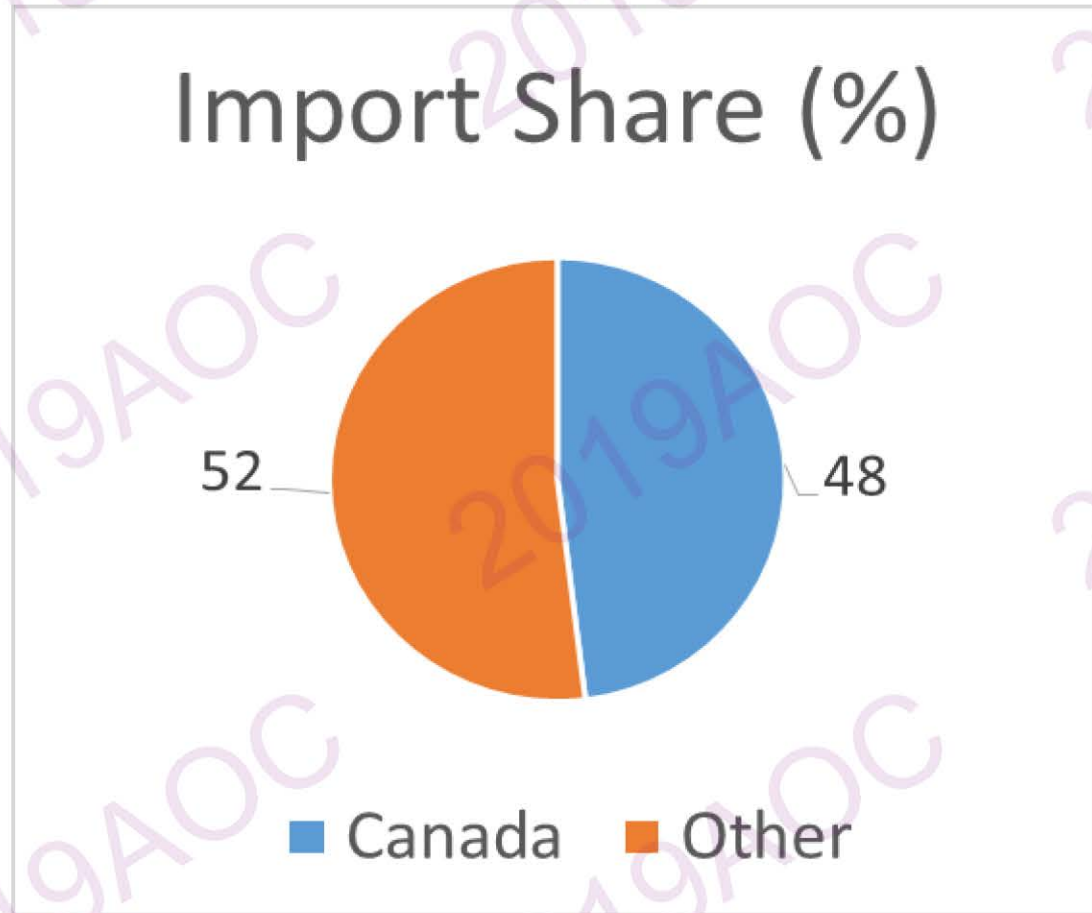


# Per Capita Food Consumption of Cereals (Year 2017)





# Source and Destination of CHINESE Wheat Trade



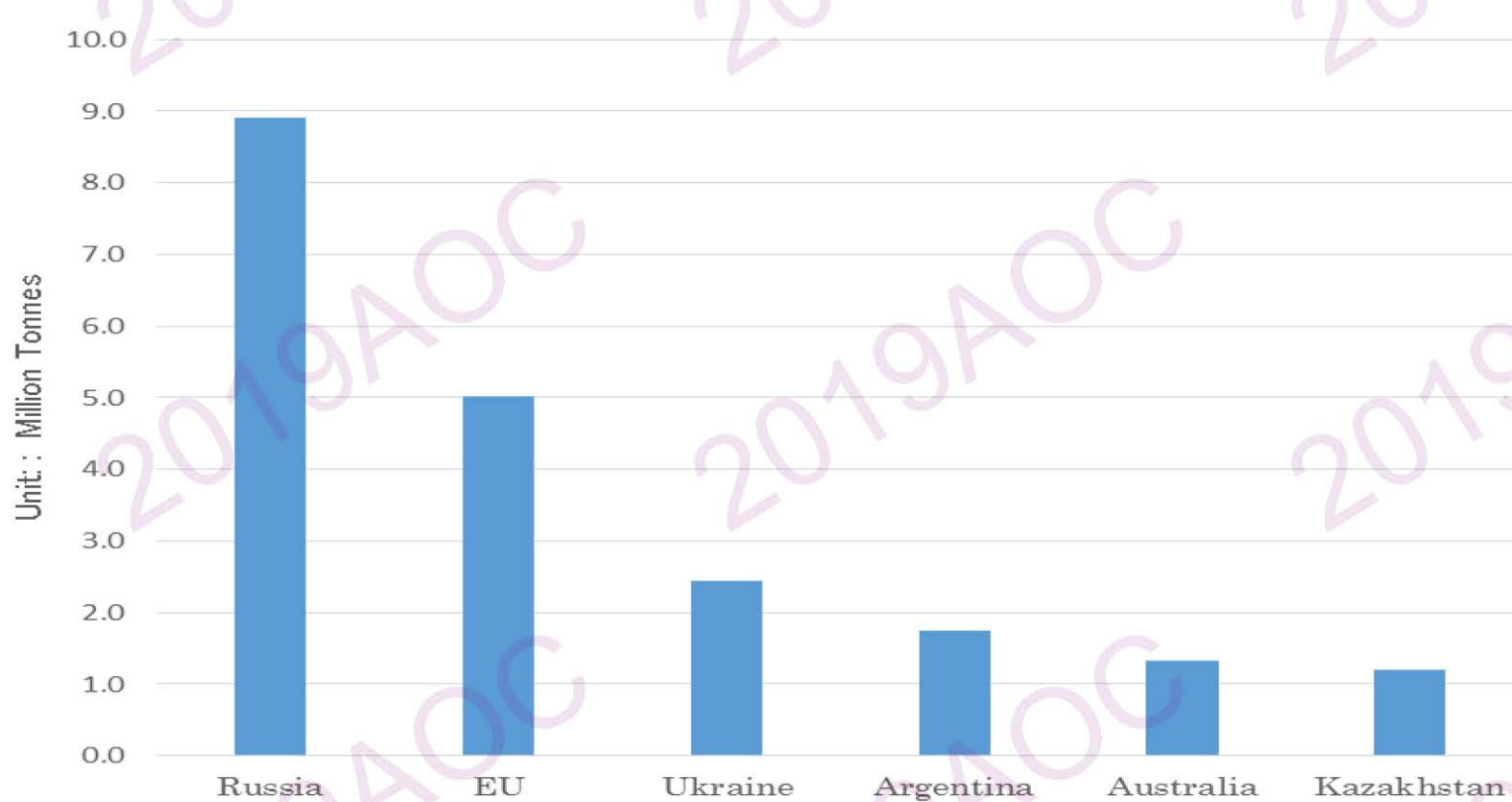
( 2.88 Million Tonnes)



(0.007 Million Tonnes)

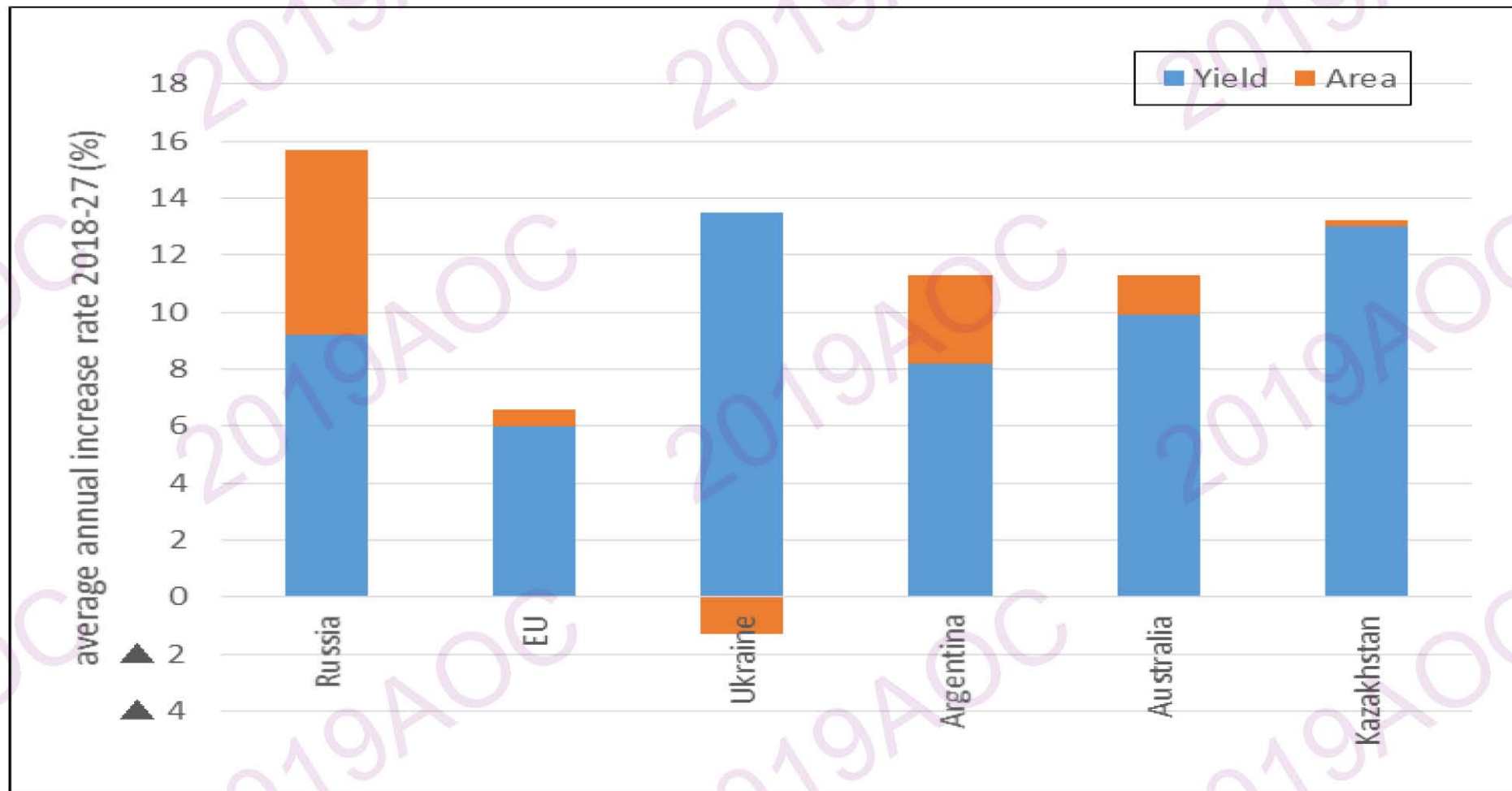
# Growing Production – Main Export Countries

- Export increase quantity in coming 10 years -



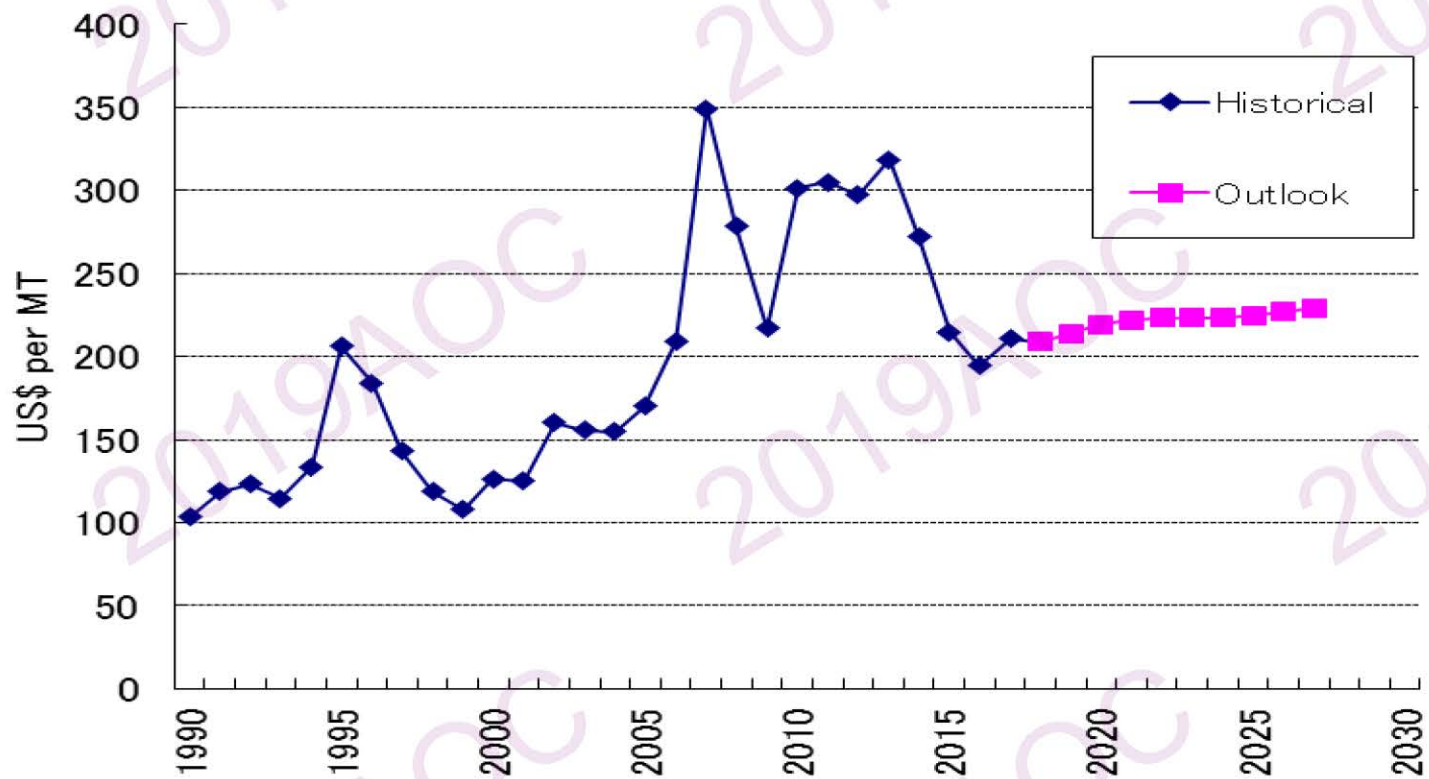
Source: OECD-FAO Agricultural Outlook 2018-2027

# Factor Decomposition of Production Growth





# Outlook of Wheat International Price



Source: OECD-FAO Agricultural Outlook 2018-2027

# Estimation of China Wheat Food Consumption Elasticities

## 1. Definition of the Equation

$$\begin{aligned} &\text{Log (China Wheat Food Consumption)} \\ &= \alpha \text{ (price elasticity)} * \log(\text{wheat price deflated by CPI}) \\ &+ \beta \text{ (income elasticity)} * \log(\text{per capita GDP index}) \\ &+ \log(\text{population}) \\ &+ \text{constant} \end{aligned}$$

## 2. Regression

```
*** File opened ( 2): c:\models\chnwt\chnwtddb.sdb
EQUATION CHNWTFOS &
CHNWTFOS=(EXP(CHNWTFOS%CON+CHNWTFOS%WTTP*(LOG(CHNWTFOS/CHNMECPI)))+CHNWTFOS%GDPI &
*(LOG(CHNMEGDPI/CHNMEPOP))+LOG(CHNMEPOP))+LOG(RES_CHNWTFOS))+ &
INFES_CHNWTFOS))
```

Nonlinear Least Squares  
-----

Convergence achieved after 7 iterations.

Equation CHNWTFOS  
-----

Dependent variable is CHNWTFOS

Variable	Coefficient	Std Err	T-stat	Signf
CHNWTFOS%CON	-4.96828	.911334	-5.45165	.000
CHNWTFOS%WTTP	-.143481	.350720E-01	-4.09103	.001
CHNWTFOS%GDPI	-.233835	.487351E-01	-4.79808	.000

R-Squared= .62778      No. obs= 18  
R-Bar-Squared (adj) = .57815  
Durbin-Watson ( 0 gaps) = 1.258525  
Sum of squared residuals = .211927E+08  
Std. error of regression = 1188.63  
Sum of residuals = 70.8740  
Mean of dependent variable = 88272.2  
Log of likelihood function = -151.350

			Actual(*) vs. Fitted(+)		Residuals(0)		
Obs.	Actual	Fitted			Residual		
2000	92000.0	89804.8	+	*	2195.23		
2001	92000.0	90507.5		+	1492.48		
2002	90000.0	91559.6	*	+	-1559.59	0	
2003	90000.0	90868.5	*	+	-868.530	0	
2004	90000.0	88297.1		+	1702.90		
2005	89000.0	89102.9		+	-102.905		0
2006	88000.0	89139.4	*	+	-1139.44	0	
2007	87000.0	88699.1	*	+	-1699.14	0	
2008	87000.0	87711.9	*	+	-711.937		0
2009	87000.0	87430.1	**	+	-430.115		0
2010	86000.0	86490.5	*	+	-490.533		0
2011	86300.0	86080.9	**		219.142		0
2012	86700.0	86176.6	+	*	523.386		0
2013	87000.0	86016.4	+	*	983.634		0
2014	87400.0	86650.0	+	*	750.047		0
2015	87500.0	87819.4	**	+	-319.399		0
2016	87800.0	88694.7	*	+	-894.673	0	
2017	88200.0	87779.7	**	+	420.328		0



### 3. Regression Results (data: 2000-2017 = 18 observation)

	estimated coefficients	t – value
constant	▲4. 97	▲5. 45 (statistically significant)
$\alpha$ (PRICE ELASTICITY)	▲0. 14	▲4. 09 (statistically significant)
$\beta$ (INCOME ELASTICITY)	▲0. 23	▲4. 80 (statistically significant)
adjusted R-Squared = 0.57815		

# CHINA Wheat Model

- Prototype pilot model
- Extendable to other crops
- 17 variables
- 10 equations  
(=10 endogenous variables)
- Baseline (market clearing)
- Various scenarios possible

- Easy to handle with
- Relatively less expensive cost
- Software requirement
  - (1) SORITEC (295 US\$)
  - (2) KEDITW (79 US\$)
  - (3) Openoffice (free download)

Thank you for your attention !

謝謝！

Note:

This presentation is based on my own research and views, and does not necessarily reflect the official views of the Government of Japan.