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SPS measures and the Hazard Rate of Chinese Agricultural Exports

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SPS Measures and the Hazard Rate of Chinese Agricultural Exports

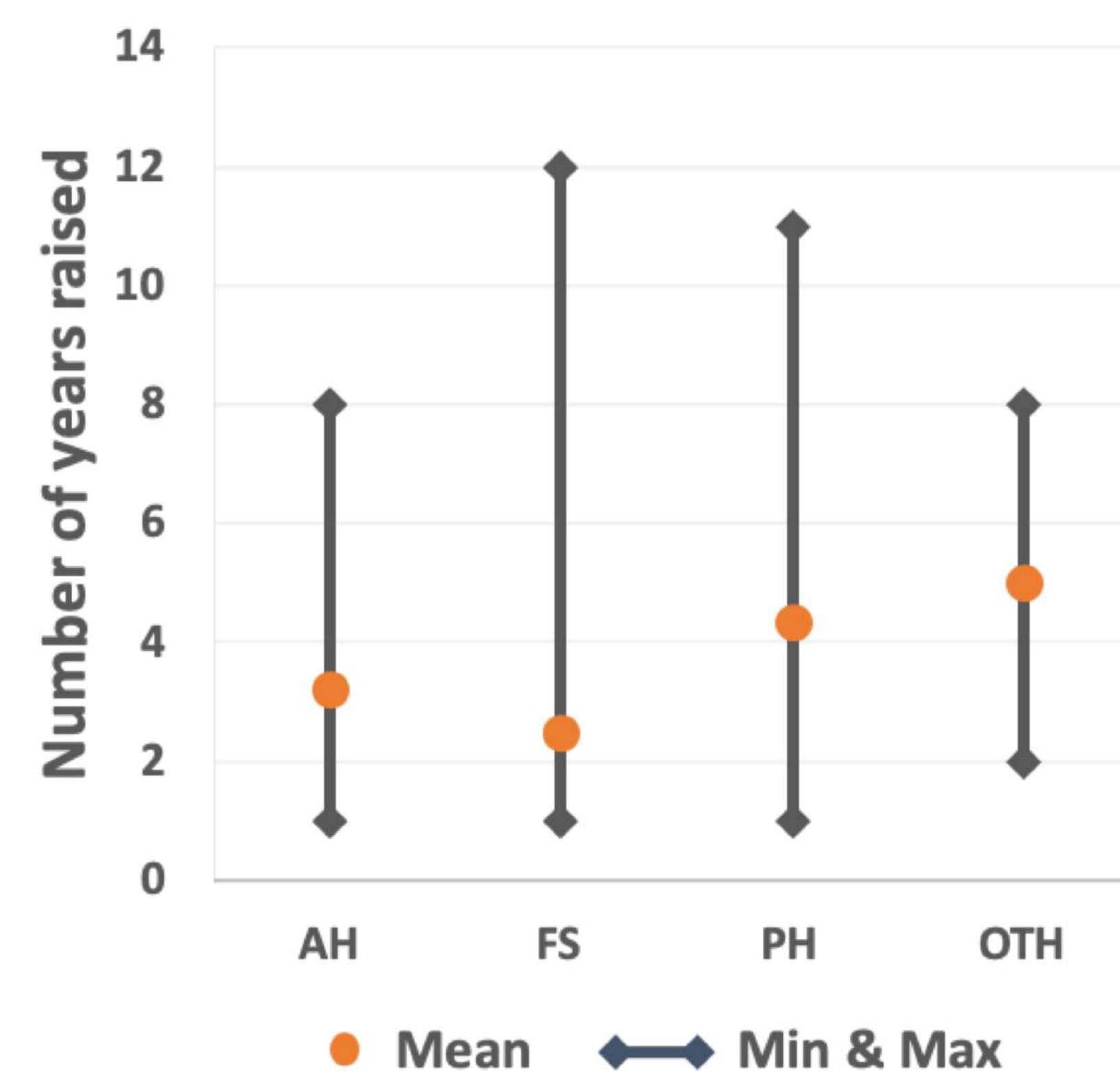
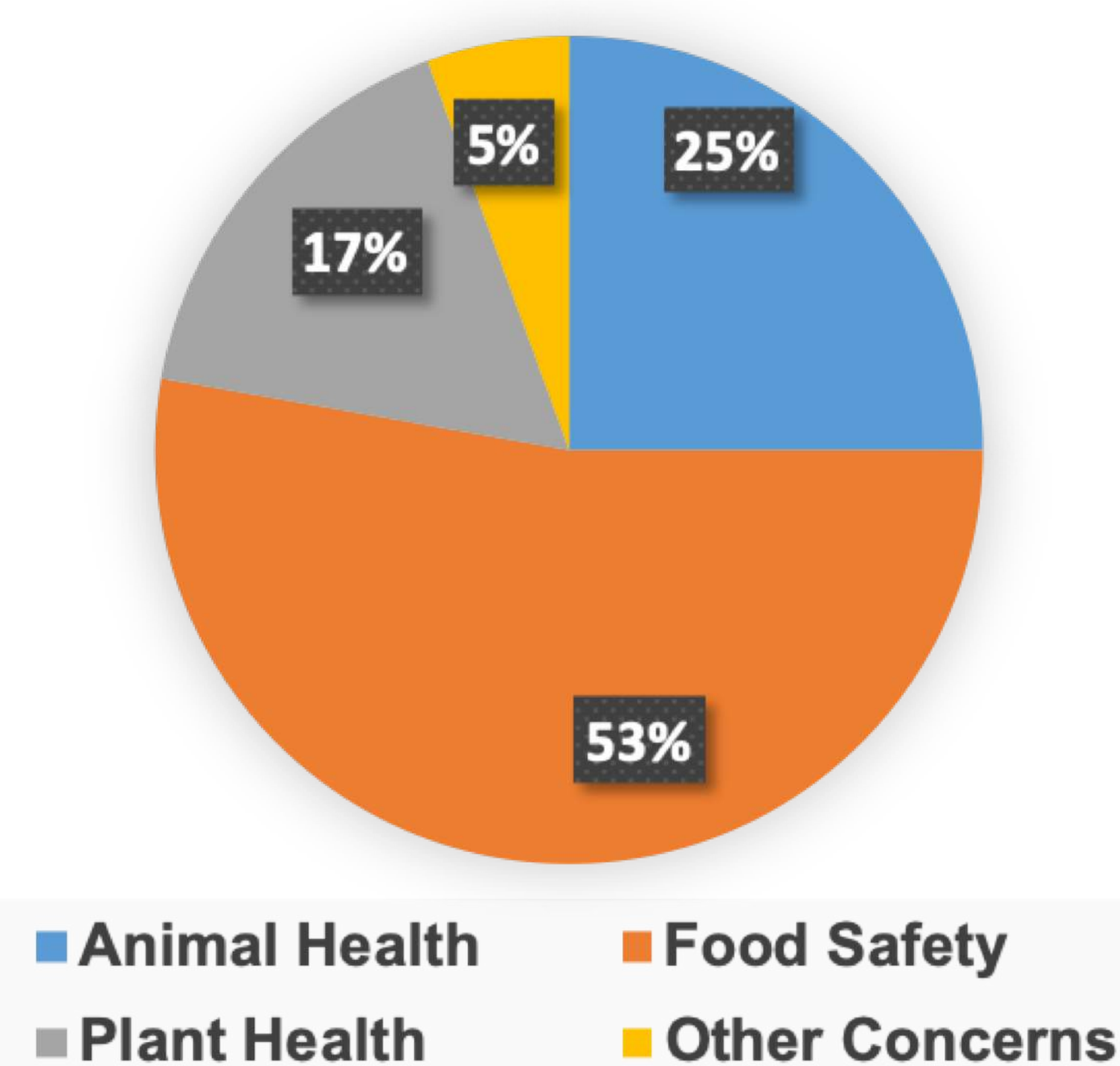
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Motivation

- Since China's accession to the World Trade Organization (WTO) in 2001, its agricultural exports have grown significantly from \$13.4 billion in 2001 to \$62.4 billion in 2017. Benefitting from reductions in tariffs and other quantitative restrictions by joining the WTO, China has emerged as the second (sixth) largest importer (exporter) of agricultural commodities in 2017.
- However, while tariffs and other border-related trade costs have come down, non-tariff obstacles have proliferated. Among the non-tariff measures (NTMs) affecting agricultural trade, sanitary and phytosanitary (SPS) regulations occupy a special place in terms of prevalence, economic significance, and trade negotiating efforts.
- Previous research has investigated the effects of SPS measures on trade flows, however, less is known about the role of these measures in determining the duration and survival of exports. This study aims to:
 - Utilize the SPS specific trade concerns (STCs) database from the WTO SPS Information Management System and provide a comprehensive summary of SPS measures revealed as specific concerns by China and explain their expected impact on the duration of exports.
 - Apply a discrete-time hazard model to investigate the extent to which SPS STCs affect the hazard rate of Chinese agricultural exports, conditional on export duration and other covariates.
 - Examine the heterogeneous effects of SPS STCs on the duration of Chinese agricultural exports by the length and/or severity of the STCs, assuming the distinctive characteristics of the SPS STCs imposed by different countries targeting different products.

SPS concerns by subjects



Model and Data

- Following Hess and Persson (2012), this study employs a discrete-time hazard model to assess the effects of SPS measures on the hazard rate of Chinese agricultural exports. The probability that the i th trade relationship ends at time $t + 1$ conditional on the relationship surviving up to the time t , (i.e., the hazard rate h), is specified as,

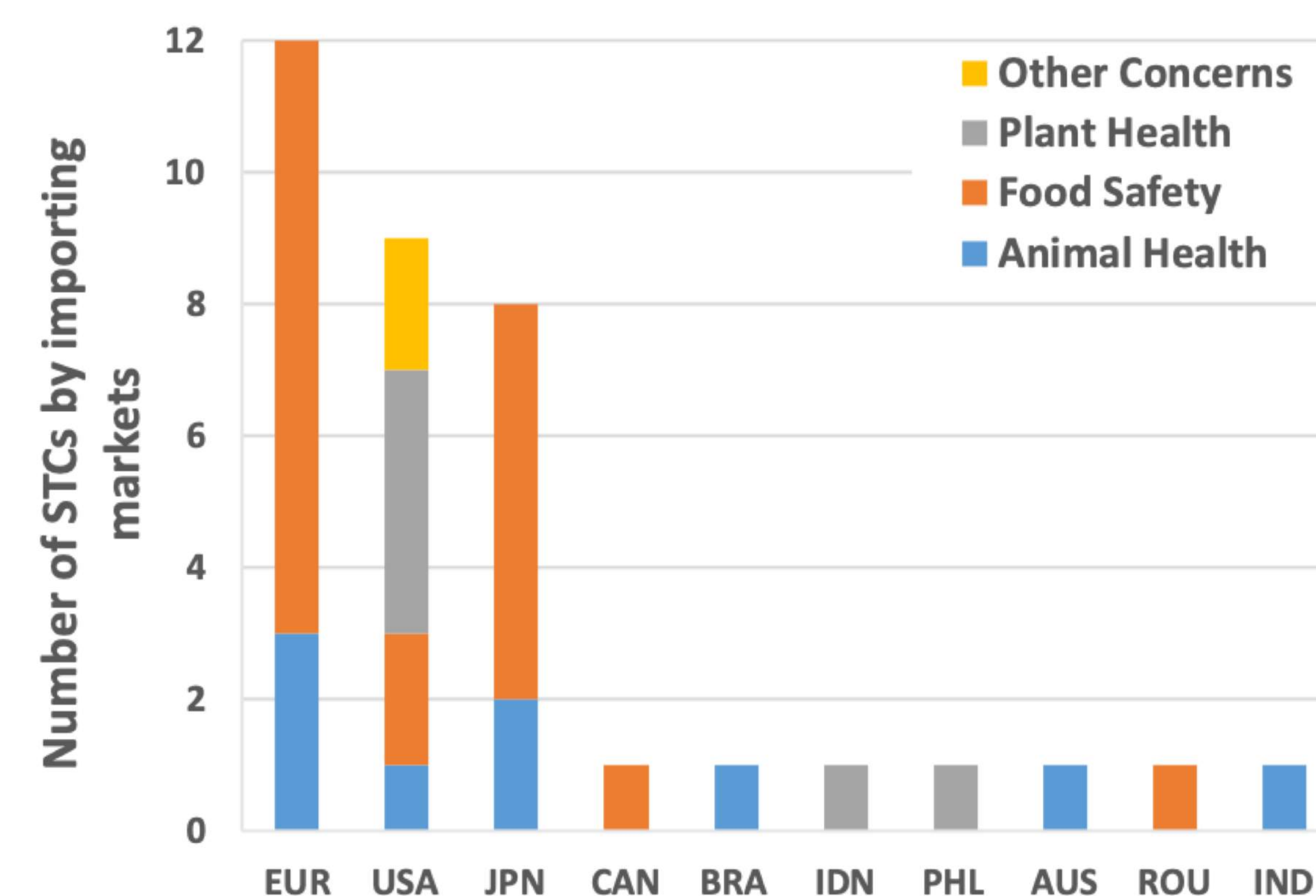
$$h_{ijkt} = (T_{ijk} \leq t + 1 | T_{ijk} \geq t) = \Phi(\mathbf{x}_{ijkt}\beta + \gamma_t)$$

- where Φ is the appropriate distribution function to ensure $0 \leq h \leq 1$, x is a set of explanatory variables, γ is a set of spell number fixed effects for the i th trade relationship.
- Let y_{it} be a dummy variable that is equal to one if the i th trade spell was observed to end during the t th time interval, and zero otherwise, the log-likelihood function for the discrete time duration model is then defined as,

$$\ln l = \sum_{i,j,k=1}^N \sum_{t=1}^T [y_{ijkt} \ln(h_{ijkt}) + (1 - y_{ijkt}) \ln(1 - h_{ijkt})]$$

$$y_{it} = \beta_1 DUR_{it} + \beta_2 LEFT_i + \beta_3 DUR_{it} * LEFT_i + \sum_{s=2}^4 \gamma_s SPL_{it,s} + \beta_4 RTA_{it} + \beta_5 \ln GDP_{it} + \beta_6 \ln INIT_{it} + \beta_7 EXP_{it} + \alpha_1 STC_{it} + \lambda_i + \varepsilon_{it}$$

- Data are collected from the United Nations Comtrade Database (1995 - 2016), the WTO SPS Information Management System (2001-2016), the World Bank Database, the Trade Analysis and Information System (TRAINS), and Centre d'Etudes Prospectives et d'Informations Internationales (CEPII).



Results

- The estimated marginal effects on the hazard rate of Chinese agricultural exports are displayed below:

	All products (1)	Fruits& Veggies (2)	Meat products (3)	Cereals& Preps (4)
Duration	-0.007*** (0.001)	-0.005** (0.002)	-0.024** (0.010)	-0.001 (0.001)
Left-censored	-0.083*** (0.013)	-0.103*** (0.014)	-0.086 (0.072)	-0.121*** (0.005)
Spell 2	-0.018*** (0.007)	-0.029*** (0.010)	-0.110*** (0.041)	0.129*** (0.004)
Spell 3	-0.038*** (0.010)	-0.041*** (0.015)	-0.079 (0.059)	0.148*** (0.005)
Spell 4	-0.045*** (0.014)	-0.056** (0.022)	-0.039 (0.079)	0.153*** (0.005)
RTA	-0.023 (0.023)	0.106* (0.057)	0.000 (.)	-0.014 (0.009)
Importer GDP	-0.023*** (0.003)	-0.096*** (0.028)	-0.037 (0.119)	0.022*** (0.007)
Initial trade	-0.064*** (0.003)	-0.076*** (0.005)	-0.065*** (0.012)	-0.162*** (0.024)
Market experience	-0.003*** (0.000)	-0.003*** (0.000)	-0.005*** (0.001)	-0.006*** (0.000)
Market concentration	0.038** (0.018)	0.041 (0.033)	0.008 (0.072)	0.027*** (0.006)
STC^a	0.032** (0.016)	0.078** (0.032)	0.094 (0.195)	0.031 (0.022)
Observations	18393	8770	657	2263

Note: The major results shown above are estimated from panel Probit model controlling for importer and time fixed effects. STC^a denotes the SPS STCs raised or supported by China for 4 years or longer.

Conclusions

- Our results show that the SPS measures that raised or supported as specific trade concerns do have heterogeneous impacts of the different products and destination markets of Chinese agricultural exports. Moreover, using different STC variables, such as different concern subjects, or concern length,
- Using the STCs of 4 years or longer, we find strong evidence of the hazardous effect of SPS specific trade concerns on Chinese agricultural exports, with an average of 3.2% increase on the estimated hazard rate. Especially, the effect on Chinese fruits and vegetable exports is about 7.8%.
- The For other factors, the longer the relationship, higher initial trade value, more exporting destinations, and lower market concentration, the lower the hazard rate would be.