IMPROVING THE ORGANIZATIONAL AND ECONOMIC MECHANISM OF CUSTOMS ADMINISTRATION TO SUPPORT FOOD SECURITY

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Abstract

This study develops a proposal for improving the organizational and economic mechanism of customs administration in support of food security in Uzbekistan. Its empirical basis is a reassessment of six regression equations covering food trade, declarations and trading enterprises, with 44 observations per equation. Holm adjustment across 24 slopes retains four associations under conservative probability bounds and five under approximate t-derived probabilities. The customs-value association with food imports remains supported; the negative import-relief result is precision-sensitive. These findings inform the economic component of the mechanism but do not measure the effect of interagency coordination. The proposed improvement links targeted fiscal evaluation, verified agency decisions, a common consignment record and feedback from operational and compliance indicators. A prospective pilot is required to establish its effects on clearance performance and food security.

Keywords

customs administration; food security; organizational and economic mechanism; interagency coordination; fiscal relief; performance evaluation.

An organizational and economic mechanism of customs administration should connect policy objectives with instruments, institutional responsibilities and measurable results. For food consignments, this means aligning fiscal decisions and clearance procedures with lawful supply and justified safety controls. Customs receipts and

declaration counts show the scale of activity but cannot by themselves establish how well the mechanism works. The study therefore asks how the economic relationships observed in customs data can inform a management arrangement whose operational results can be independently evaluated.

The objective is to develop an improvement proposal that links economic instruments, interagency coordination, information exchange and corrective feedback. The economic component concerns payments, valuation, duty and relief. The organizational component concerns the allocation of decisions, exchange of verified evidence and coordination of processing stages. FAO's framework distinguishes availability, access, utilization and stability [2]; trade and clearance indicators capture only part of that wider food-security objective. The mechanism should consequently monitor both the movement of food and compliance, while household access and nutritional outcomes require separate evidence.

The six outcome variables are food imports, food exports, total declarations, import declarations, export declarations and the number of trading enterprises. Every equation reports 44 observations and five estimated parameters: an intercept and four predictors—customs payments, customs value, import duty and fiscal relief. The general specification is:

$$Y_{jt} = \alpha_j + \beta_{1j}P_t + \beta_{2j}V_t + \beta_{3j}D_t + \beta_{4j}R_t + \varepsilon_{jt}. \quad (1)$$

Here j identifies an outcome, while P, V, D and R denote the four predictors. With common regressors, mvreg produces the same equation-level coefficients and standard errors as separate ordinary least squares regressions and additionally estimates cross-equation covariance [3]. The interpretation here concerns conditional associations, not an identified causal intervention.

The analytical window is described as 2014–2025, or 48 quarters, whereas the outcome and estimation tables contain 44 observations. Exact estimation dates remain

unspecified. Fiscal descriptives are described as logarithmic, but the transformation base, original monetary units and their use in estimation are not fully documented. Coefficients are retained on the reported scale without interpretation as dollar changes or elasticities. Original dated observations and residuals are needed to verify stationarity, serial dependence and other diagnostics.

Holm adjustment [4] covers all 24 slopes, excluding intercepts. For probabilities reported to three decimals, a conservative upper bound $p^{+} = \min(1, p_{printed} + 0.001)$ accommodates rounding or truncation; a printed zero is assigned 0.001. A sensitivity calculation reconstructs approximate two-sided probabilities from rounded t statistics with $44 - 5 = 39$ residual degrees of freedom. This procedure reassesses existing estimates rather than fitting new regressions.

The reported R^2 values are 0.9225 for food imports and 0.7276 for food exports. Administrative equations also have high fit, ranging from 0.9028 for enterprises to 0.9650 for export declarations. These statistics describe in-sample relationships. They do not indicate that customs administration generated a corresponding percentage improvement in food security. Joint determination of payments, valuation and trade, together with shared trends, remains a competing explanation.

Across the complete family, eight slopes meet the nominal five percent criterion; four meet the conservative Holm criterion and five meet the approximate t-derived criterion. Table 1 reports every food-trade slope. Figure 1 includes all 24 test statistics so that the wider family used for adjustment remains visible.

The strongest retained food-trade association concerns customs value and imports: $\beta = 605.641$, with a reported, unadjusted 95 percent confidence interval of 329.951–881.330 and a conservative Holm bound of 0.024. Its interpretation is limited by the valuation relationship itself. Customs value can change with quantities, prices and composition; the coefficient alone cannot establish better access to food or a more

effective clearance process. Fiscal relief has a negative import coefficient of −206.160, with an unadjusted interval of −331.328 to −80.991 and nominal p = 0.002. The conservative adjusted upper bound is 0.060, compared with approximately 0.038 reconstructed from the t statistic. This precision-sensitive result does not establish that relief substitutes domestic production for food imports. Evidence on what received relief, subsequent production and the relevant timing would be required.

For exports, the customs-payments coefficient is nominally significant (β = 198.686; p = 0.049), but its conservative adjusted bound is 0.850. No food-export slope meets either adjusted criterion. The remaining conservative findings concern payments and relief in export declarations, and relief in enterprise numbers. They describe administrative associations, not verified formalization of previously informal trade. The reported payment–duty correlation of 0.984 also warrants scrutiny of collinearity on the actual estimation sample.

Table 1: Food-trade coefficients and multiple-testing adjustment

Outcome and predictor	Reported β	Reported p	Holm upper bound
Food imports Customs payments	187.476	0.076	1.000
Food imports Customs value	605.641	<0.001	0.024
Food imports Import duty	35.181	0.786	1.000
Food imports Fiscal relief	-206.160	0.002	0.060
Food exports Customs payments	198.686	0.049	0.850
Food exports Customs value	137.405	0.295	1.000
Food exports Import duty	-117.054	0.343	1.000
Food exports Fiscal relief	-28.877	0.626	1.000

N = 44 per equation. Holm bounds cover all 24 slopes, not only the eight displayed. Printed p = 0.000 is shown as <0.001; conservative calculation uses 0.001. Coefficients retain the reported scale. Source: [1] and calculations.



Figure 1 Reported t statistics across the six equations. Stars identify conservative Holm bounds ≤0.05 within the 24-test family. Colors indicate statistical direction, not causal effect size. Source: [1] and calculations.

Improving the organizational and economic mechanism

The empirical results identify limits to the economic interpretation of the mechanism. They do not directly evaluate organizational coordination, since the estimated equations contain no measures of document duplication, agency handoff time or safety compliance. The improvement proposal therefore adds a management layer that can be tested at consignment level. It links instrument selection to responsibility for execution, records what happened and uses measured outcomes to revise procedures. Table 2 sets out the proposed components and their evaluation measures.

Component	Management instrument	Evaluation measure
Economic	Relief eligibility and beneficiary register	Eligibility compliance and documented fiscal cost
Organizational	Verified agency decisions and reason-coded requests	Unnecessary repeat requests per eligible consignment
Information	Linked consignment records and timestamps	Median and P90 referral-to-decision time

Feedback	Independent audit and recorded process review	Non-compliant audited cases / all audited cases

Table 2: Proposed components of the organizational and economic mechanism

Author's proposal, not measured results. P90 is the 90th percentile. Rules for eligibility and unnecessary requests must be defined before the pilot. Audit sampling must remain comparable over time.

For the economic component, relief should be linked to defined goods, beneficiaries, duration and intended outcomes. Evaluation should trace actual use and distinguish resource savings from tax transfers. The negative import coefficient does not establish that relief caused import substitution. For the organizational component, each competent authority should remain responsible for its decision. Customs could reuse a verified decision only when its scope, validity and legal conditions cover the consignment; additional requests should carry a documented reason.

The information component should link declarations, certificates, agency decisions and release events through a common consignment identifier. A process coordinator would then be able to locate a delay and assign responsibility for resolving missing information. Reuse should be blocked when a decision is expired, incomplete or inapplicable. This arrangement is intended to reduce avoidable repetition while preserving the evidence needed for regulatory control. Neither faster release nor a higher reuse rate should override laboratory methods or a competent authority's safety decision.

WTO provisions on risk management, perishable goods and agency cooperation, together with SPS principles of scientific justification, provide international design benchmarks [5,6]. A pilot should define eligible consignments, comparison groups and indicators before implementation. It should examine pre-intervention patterns and account for seasonality, product composition and concurrent reforms. Outcomes should include release-time distributions and independently audited compliance; detection rates

from targeted inspections alone would be affected by selection. The results would guide a documented decision to retain, modify or discontinue the process.

Conclusion

The proposed improvement brings economic instruments, institutional responsibilities and feedback into one evaluable management arrangement. The six-equation analysis supports a customs-value association with food imports, while the import-relief finding is sensitive to reporting precision and export associations do not survive adjustment. These findings delimit the economic evidence; the organizational proposal requires its own pilot evaluation. The management contribution is a mechanism in which fiscal decisions, agency coordination and corrective action are assessed through explicit measures. Dated observations, reconciled definitions and verified diagnostics remain necessary for stronger econometric conclusions. No national saving or causal improvement in food security is claimed.

References

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