Personality and Resistance to Public Technology: Big Five Predictors of ETC Non-Adoption

Abstract

Using ETC non-adoption as an empirical entry point, this study examines why individuals resist a public technology that appears, on the surface, to be more efficient and rational. Moving beyond conventional technology adoption research that emphasizes convenience, efficiency, and intention to use, the study situates ETC within a broader context of automated governance, back-end payment infrastructures, and institutionally embedded rules. It asks how public technology systems generate psychological resistance by reducing process visibility, reshaping perceived control, and reallocating risk responsibility. Drawing on Technology Resistance Theory and the Big Five personality framework, the study uses 618 valid survey responses, measures personality traits with the BFI-20 scale, and applies ordered logit models to examine how extraversion, agreeableness, conscientiousness, neuroticism, and openness predict usage, value, and risk barriers. The findings show that neuroticism and openness are the key personality predictors of ETC resistance: neuroticism amplifies perceived loss of control and risk concerns toward less visible automated systems, while openness strengthens reflective scrutiny of institutional technologies' efficiency claims and potential risks. The study suggests that public technology adoption is not merely an instrumental choice, but the outcome of interactions among technological arrangements, institutional trust, and individual psychological dispositions.

Main Finding

The central proposition of this study is that ETC non-adoption is not simply caused by inconvenience or limited technical ability. Rather, it reflects how institutionally embedded public technologies enter everyday life and trigger psychological responses to automation, opacity, and risk transfer. ETC is not merely a consumer technology; it is a public technology system linking traffic governance, platform-based payment, and rule enforcement. Whether individuals accept it therefore depends not only on whether it is faster, but also on whether they perceive the system as understandable, controllable, and accountable. Personality traits shape these perceptions by influencing usage, value, and risk barriers, thereby generating differentiated resistance to ETC. Based on this proposition, the study tests three main hypotheses.

First, H1 argues that individuals higher in neuroticism are more likely to perceive stronger usage barriers. The table results support this hypothesis: the coefficients of neuroticism are 0.595 without controls and 0.647 with controls, both significant at the 1% level. This suggests that usage barriers are not mainly about operational difficulty, but about the perceived loss of control created by automated recognition, back-end payment,

and invisible transaction processes. Openness also shows a marginally significant positive effect in this model (0.181 and 0.193), indicating that more reflective individuals may also question the opacity of the ETC process.

Second, H2 proposes that personality traits influence how individuals evaluate the value of ETC. The table results show that neuroticism has a stable positive effect on value barriers, with coefficients of 0.604 and 0.695, both significant at the 1% level. Openness is also significantly positive, with coefficients of 0.236 and 0.254, significant at the 5% level. Conscientiousness shows a marginally significant negative effect before controls are included (-0.214), but this effect becomes insignificant after controls. These findings indicate that individuals high in neuroticism are more likely to incorporate possible system failure, incorrect deductions, and dispute-resolution costs into their value judgments, thereby lowering their evaluation of ETC's efficiency benefits. Individuals high in openness tend to scrutinize the convenience and efficiency claims attached to institutional technologies.

Third, H3 expects risk perception to reduce technology adoption willingness by strengthening perceived risk barriers. The table results show that neuroticism is the strongest predictor of risk barriers, with coefficients of 0.721 and 0.781, both significant at the 1% level. Openness also significantly increases risk barriers, with coefficients of 0.361 and 0.359, again significant at the 1% level. By contrast, extraversion, agreeableness, and conscientiousness do not show significant effects in the risk barrier model. This suggests that ETC risk perception is shaped by two mechanisms: emotional amplification among individuals high in neuroticism, and critical scrutiny among individuals high in openness.

Overall, the table results identify neuroticism and openness as the key personality dimensions behind ETC resistance. The challenge of promoting ETC is therefore not only a matter of communicating efficiency, but also of whether users perceive the system as visible, explainable, controllable, and reliable when errors occur. Public technology promotion should therefore move beyond speed- and convenience-based appeals and pay greater attention to transparency, trusted correction mechanisms, and risk communication.