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What Drives Family Firm Export Performance? Evidence from Explainable AI on Leadership and Innovation

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Abstract

This paper examines how leadership characteristics, innovation, and technology adoption shape the export performance of family-owned firms in key EU economies. Using data from 4,507 family firms from the World Bank Enterprise Surveys in Germany, Ireland, Sweden, Belgium, France, Luxembourg, and the Netherlands, we combine multiple linear regression with XGBoost and SHapley Additive ExPlanations (SHAP) to identify and interpret drivers of export intensity. The regression results show that managers' education, previous experience, and age are associated with export performance, whereas having a national-born manager is negatively related to exports. Product and process innovation display positive and significant effects on export intensity. Technology adoption exerts a selective influence: Enterprise Resource Planning systems (ERP) strongly enhance export performance, while Supplier Relationship Management (SRM) and foreign-licensed technology show no significant effects. The XGBoost–SHAP analysis confirms the central role of managerial education, ERP adoption, innovation, and firm size among the most influential predictors, and explains how these variables change predicted export shares. Overall, the study clearly shows that leadership quality, innovation, and digitalisation jointly underpin the international competitiveness of family firms and offer implications for managers and policymakers seeking to strengthen their export capacity.

Keywords: European Union; Machine Learning; SHAP Values; Technology Adoption; Xgboost