



# Justice and finance: Does judicial efficiency contribute to financial system efficiency?

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## ARTICLE INFO

### Keywords:

Judicial efficiency  
Financial system efficiency  
Financial development  
Property right  
Contract enforcement

## ABSTRACT

Efficient financial systems play a crucial role in promoting economic growth and development. This study explores the impact of judicial efficiency (JE) on financial system efficiency (FSE) and its components, financial institutions efficiency (FIE) and financial markets efficiency (FME), across 108 countries over the period from 2004 to 2020. Utilizing a fixed effect regression for our baseline analysis and a two-stage least squares (2SLS) regression to address endogeneity, we find robust evidence that JE has a positive and significant effect on FSE and its components, FIE and FME. Moreover, we find that JE's positive impact on FSE and its components holds across different levels of per capita income, including high-income, low-income, and emerging market economies. Our findings, which are confirmed by several robustness checks, highlight the universal importance of a well-functioning, efficient judicial system in driving FSE regardless of a country's economic context. The results show that countries should prioritize reforms to strengthen judicial institutions and enhance efficient contract enforcement. An efficient legal framework and judicial process are conducive to creating an environment in which an efficient financial system can develop, paving the way for sustainable economic growth.

## 1. Introduction

An efficient financial system is vital to the economic growth and development that countries around the world seek (Diallo, 2018; Taddese Bekele & Abebaw Degu, 2023). An efficient financial system lowers transaction costs, and helps to allocate resources effectively and optimize resource use, which boosts economic performance (Greenwood & Jovanovic, 1990; Levine, 1997). Moreover, efficient financial systems are less vulnerable to financial crises and support financial and economic stability (Yuan, Wu, & Liu, 2022), which are of paramount importance to an economy. The literature emphasizes that even if a financial sector is sufficiently large and widely accessible, its contribution to economic growth would not be optimal if financial institutions are inefficient and wasteful (IMF Sviryzdenka, 2016). In short, the benefits of an efficient financial system are immense.

Promoting financial system efficiency (FSE) could therefore be a key strategy that helps countries achieve optimum economic growth and

development with their available resources, especially those that face challenges in this area. Considering the importance of FSE, a vast body of finance and economics research has investigated and identified its many determinants (see, Nisar Ahmad, Naveed, Ahmad, & Butt, 2020; Voghouei, Azali, & Jamali, 2011).

Other studies have identified various institutional characteristics as important drivers of FSE. Since the publication of seminal studies by Rafael La Porta, Lopez-De-Silanes, Shleifer, and Vishny (1997); Rafael La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998), a large body of literature has confirmed that legal rules regarding contract enforcement, creditors' rights, and property rights and their enforcement have a significant effect on financial system development. Recently, Khan, Gu, Khan, and Bhatti (2022) corroborated this and showed that a robust institutional environment significantly promotes the depth, access, and efficiency of a country's financial system. Pistor, Raiser, and Gelfer (2000) emphasize the difference between the quality of laws on paper and their enforcement in practice, revealing that the latter exerts a more

Peer review under responsibility of Borsa İstanbul Anonim Şirketi.

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<https://doi.org/10.1016/j.bir.2023.12.013>

Received 24 July 2023; Received in revised form 18 December 2023; Accepted 30 December 2023

Available online 1 January 2024

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significant influence on the financial sector.

Despite significant advances in our understanding of the importance of legal, regulatory, and institutional factors in fostering FSE, one critical aspect remains underexplored: the efficient enforcement of rules through the judiciary. As a formal mechanism for enforcing contracts and protecting property and creditors' rights, judicial efficiency (JE) holds untapped potential to enhance FSE, warranting further investigation.

Given this background, we investigate the effect of JE, defined as the speed and cost of a nation's court system, on FSE. JE refers to the delivery of justice by the courts and the judicial system in a timely and cost-effective manner. A judiciary that provides timely and cost-effective (affordable) justice is essential to creating a favorable environment in which the financial sector can flourish. An efficient judicial system ensures effective enforcement of contracts, creditors' rights, and property rights, lowers transaction costs, and may enhance FSE.

This study contributes to the literature by exploring how JE affects FSE. Most existing studies emphasize aspects of a legal system (i.e., laws pertaining to contracts, creditors' rights, and property rights protection) that relate to financial system development and efficiency but overlook the crucial role of efficient enforcement of these laws in FSE. This study bridges this gap by highlighting the significance of JE in shaping FSE and emphasizes the important role of enforcement efficiency in FSE. Moreover, we provide more reliable evidence on the nexus of JE and FSE by utilizing a more direct and comprehensive measure of JE and FSE, in contrast to previous studies that rely on subjective and indirect indicators of law enforcement. Additionally, we use the largest available international sample and reliable estimators that address endogeneity and provide important causal evidence.

We find robust evidence that JE has a positive and significant effect on FSE and its components, namely financial institutions efficiency (FIE), and financial markets efficiency (FME). Furthermore, the positive impact of JE on FSE and its components holds true across different levels of economic development, including high-income, low-income, and emerging market economies. Hence, this study highlights the universal importance of a well-functioning judicial system in driving FSE. The results show that countries should prioritize reforms that strengthen their judicial institutions and enhance contract enforcement mechanisms. An efficient legal framework and efficient judicial processes create a conducive environment for financial system development, paving the way for sustainable and high-quality economic growth.

The remainder of this study is structured as follows: In Section 2, we develop hypotheses based on the theoretical and empirical literature. Section 3 outlines the econometric strategy, variables, and data sources used in the analysis and Section 4 presents and discusses the results. Finally, in Section 5, we conclude the study and provide policy implications.

## 2. Literature review and hypotheses development

The role of institutions in financial system operations, which has been widely discussed in the literature, can be broadly divided into theoretical and empirical studies. The theoretical foundations for understanding the linkages between JE and FSE are rooted in New Institutional Economics (NIE) transaction cost theory (Coase, 1998), and law and finance theories (La Porta, Lopez-de-Silanes, Shleifer, & Vishny, 1998; La Porta, Lopez-de-Silanes, Shleifer, & Vishny, 1998). Transaction cost theory focuses on the costs of conducting economic transactions, including information acquisition, negotiations, and contracts enforcement. The core tenet of NIE is that information is incomplete, unequally distributed, and costly to acquire. D. North (1981); D. C. North (1990) and other institutional economists, such as Groenewegen, Spithoven, and Van Den Berg (2010) provide a comprehensive overview of NIE transaction cost theory, exploring how institutions evolved to mitigate uncertainties arising from information asymmetries and transaction costs.

Institutions play a crucial role in influencing economic and financial activities by enforcing contracts, protecting property rights, and reducing transaction costs. Information asymmetry and transaction costs are common in financial institutions and markets, which undermines FSE. Hence, an efficient judicial system that supports effective contract enforcement and safeguards property rights could serve as a vital catalyst in promoting FSE. Rafael La Porta et al. (1997); Rafael La Porta et al. (1998) emphasize that sound legal and regulatory institutions firmly enforce contracts and protect creditors' and property rights, thus playing a pivotal role in fostering financial system development.

These theoretical arguments are corroborated by numerous empirical studies. For example, Acemoglu and Johnson (2005) demonstrate that a high-quality institutional environment, characterized by robust rights protections, reduces contract enforcement costs and lowers the risk of expropriation. Under such conditions, investors and other suppliers of capital are more likely to contribute to the development of a strong financial sector. Their empirical evidence strongly corroborates this assertion. In a similar vein, Dima, Barna, and Nachescu (2018) document that robust legal institutions, including an independent judiciary, protects creditors and property rights, enhancing the function of financial system. Simply put, upholding law and order, ensuring contract enforcement, and maintaining a fair and predictable legal system significantly benefit a country's financial sector. Law, Kutan, and Naseem (2018) contend that a sound institutional environment triggers the growth-enhancing role of financial sector development. Furthermore, the quality of institutions enhances financial sector development by curbing expropriation risk (Ellahi et al., 2021; Herger, Hodler, & Lobsiger, 2008; Naved Ahmad & Ali, 2010); H. Khan, Khan, and Zuojun (2020); (Muhammad Asif Khan, Kong, Xiang, & Zhang, 2019) report similar findings.

One stream of the literature focuses specifically on the role of institutions in enhancing the efficiency of various components of a financial system. A well-functioning institutional environment can promote competition by attracting foreign participants to the local financial sector, enhancing the financial system's efficiency (Staikouras, Mamatzakis, & Koutsomanoli-Filippaki, 2008). Lensink, Meesters, and Naaborg (2008) rigorously analyze a diverse sample of 2095 banks in various countries to explore the influence of institutional quality on the financial efficiency of foreign banks. Their findings underscore the substantial impact of institutional quality in enhancing the efficiency of foreign banks. Moreover, Naghavi and Lau (2014) show that an intriguing interaction between the institutional environment and financial liberalization further augments financial market efficiency.

Considering the importance of judicial institutions in enforcing contracts and protecting property rights, studies also focus on the role of JE in promoting the efficiency of financial sector. A notable analysis by Laeven and Majnoni (2005) delves into the judiciary's impact on bank lending spreads using a cross-country sample. Their findings demonstrate that strong judicial enforcement of contracts significantly reduces the cost of financial intermediation for both households and businesses. This underscores the importance of a robust and efficient judicial system in promoting accessible and cost-effective financial services for an economy. Contract enforcement by the judicial system is found to have significant effect on credit markets by directly impacting the risks and costs associated with credit transactions (Hoang, 2003). In a cross-country analysis Cooray (2011) finds that government quality, assessed through governance and legal origin, positively impacts financial sector and efficiency. Ximeng and Zhiwen (2023) investigate the effect of judicial independence on financial markets in context of emerging market economies and show that judicial independence fosters development of financial markets. Based on the findings in the theoretical and empirical literature, we develop the following hypothesis: *Judicial efficiency (JE) significantly promotes financial system efficiency (FSE).*

**Table 1**  
Definitions of the variables and data sources.

Variables	Definitions	Data source
Financial Markets efficiency (FME)	Measures how well a country’s financial markets facilitate the exchange of financial assets, diversify risks, and allocate capital using the FME index compiled by IMF Svirydzienka (2016).	(IMF Svirydzienka, 2016)
Financial institutions efficiency (FIE)	Measures how well a country’s financial intermediaries facilitate the exchange of financial assets, diversify risks, and allocate capital, using the FIE index compiled by (IMF Svirydzienka, 2016).	(IMF Svirydzienka, 2016)
Financial system Efficiency (FSE)	Derived by averaging the efficiency indices of financial institutions and financial markets (FIE and FME) compiled by (IMF Svirydzienka, 2016).	
Judicial Efficiency (JE_Time)	The inverse of the number of days taken to resolve a judicial case, spanning from the initiation of the case to the implementation of the final court decision, following Shah et al. (2017)	World Bank’s “Doing Business” database
JE_Cost	Costs associated with a court trial, encompassing court fees, enforcement costs, and average attorney fees, as a percentage of the total claim amount.	World Bank’s “Doing Business” database
Economic Growth (GDP_PC)	GDP per capita, in constant 2015 USD.	WDI
Financial sector size (DC_PS)	Domestic credit in the private sector as a % of GDP.	WDI
Quality of Governance (GoG)	Measured using the governance quality index generated using a Principal Component Analysis based on voice and accountability, political stability and absence of violence, government effectiveness, regulatory quality, rule of law, and control of corruption.	WGI
Trade openness	Total value of all imports and exports as a % of GDP.	WDI
Financial openness	Measured using the amount of foreign direct investment, net inflows (% of GDP).	WDI
Human Capital	Percent of the country’s gross primary school enrollment.	WDI
Inflation	Annual growth rate of the GDP implicit deflator, which shows the rate of price changes in the economy.	WDI
Government Size	Government expenditures as a % of GDP.	WDI
Legal origin	The legal tradition of the commercial code the country inherited, the variable is equal to 1 if legal origin is English Common Law, 2 if it is French Commercial Code, 3 if it is socialist/communist law, 4 if it is the German Commercial Code, and 5 if it is the Scandinavian Commercial Code.	(R. La Porta, Lopez-de-Silanes, Shleifer, & Vishny, 1999) and CIA Factbook

**Table 1 (continued)**

Variables	Definitions	Data source
Latitude	The country’s absolute latitude of a country, used as a proxy for geographic location.	QoG standard data set
Culture	The religious fractionalization measure of Alesina, Devleeschauwer, Easterly, Kurlat, and Wacziarg (2003).	QoG standard data set

**Table 2**  
Effect of JE on FSE: Baseline results.

VARIABLES	(1)	(2)	(3)
	FSE	FIE	FME
JE_Time	.036** (.016)	.011** (.005)	.091*** (.03)
GDP_PC	.03*** (.009)	.053*** (.01)	-.002 (.017)
DC_PS	.008* (.004)	.019*** (.004)	-.004 (.008)
QoG	.013** (.006)	.004 (.006)	.021* (.011)
Trade Openness	.012* (.007)	-.01 (.008)	.036*** (.013)
Financial Openness	.006*** (.001)	0 (.001)	.012*** (.002)
Human Capital	.008 (.018)	-.008 (.019)	.036 (.033)
Inflation	.002* (.001)	.001 (.001)	.003 (.002)
Govt_Exp	-.018 (.017)	.019 (.018)	-.053* (.031)
Constant	-.231 (.172)	.029 (.179)	-.506 (.313)
Country fixed effect	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes
Observations	1524	1524	1524
Number of countries	108	108	108
Adj_R_Squared	.162	.168	.162
F-Stat	35.10***	38.10***	33.11***

Note: This table reports baseline fixed effect regression estimates. FSE is overall financial system efficiency, FIE is financial institutions’ efficiency and FME is financial markets’ efficiency. Robust standard errors are in parentheses that clustered at country level. \*\*\*p < .01, \*\*p < .05, \*p < .1.

### 3. Methodology

#### 3.1. Econometric strategy

The aim of this study is to examine how JE influences FSE across 108 countries over the period from 2004 to 2020. The sample used depends on data availability for the variables chosen for the study. We apply a fixed effect regression model as the baseline estimation method to account for omitted variable bias, which may arise when one or more unobserved factors affect both the dependent and explanatory variables. Previous comparable empirical studies also use fixed effect regression for this reason. Based on the literature, we specify the following baseline econometric model:

$$FSE_{it} = \beta_0 + \beta_1 JE_{it} + \beta_n X_{it} + \varepsilon_{it} \tag{Eq. (1)}$$

where FSE is the dependent variable,  $\beta_0$  is a constant,  $\beta_1$  is the coefficient of independent variable JE,  $\beta_n$  represents the coefficients of a set of control variables X, consisting of economic growth (GDP\_PC), size of the financial sector (DC\_PC), quality of governance (QoG), trade openness, financial openness, human capital, inflation, and government size.  $\varepsilon_{it}$  is the error term, and the subscripts *i* and *t* represent country and time, respectively.

We note there may be an endogeneity problem between JE and FSE,

**Table 3**  
The effect of JE on FSE: 2SLS Results.

	(1)	(2)	(3)	(4)
	JE	FE	FIE	FME
	First stage	Second stage	Second stage	Second stage
Instrument	-.008*** (.001)			
JE_Time(Instrumented)		.263*** (.038)	.148*** (.03)	.385*** (.053)
GDP_PC	.027* (.015)	.025*** (.007)	-.004 (.004)	.058*** (.012)
DC_PS	-.014 (.012)	.067*** (.008)	.035*** (.004)	.102*** (.015)
QoG	.006 (.013)	.017*** (.007)	-.003 (.005)	.043*** (.012)
Trade Openness	.168** (.018)	-.137*** (.011)	-.037*** (.007)	-.25*** (.019)
Financial Openness	-.006 (.005)	-.005 (.003)	.001 (.002)	-.012* (.006)
Human Capital	-.164** (.075)	-.091*** (.033)	.007 (.025)	-.214*** (.058)
Inflation	.026*** (.006)	-.003 (.003)	-.004* (.002)	0 (.005)
Govt_Exp	.163** (.071)	-.066* (.037)	-.087*** (.024)	-.051 (.069)
Constant	6.262*** (.564)	-.656* (.352)	-.168 (.273)	-1.06* (.606)
Fixed effects	Yes	Yes	Yes	Yes
Observations	1117	1117	1117	1117
Adj.R-Squared	.354	.221	.112	.417
F-Stat	36.11***	66.50***	27.9***	64.04***
Under Identification test:				
Kleibergen-Paap rk LM statistic		57.630	57.630	57.630
P-value		0.0000	0.0000	0.0000
Weak identification test				
Cragg-Donald Wald F statistic		128.898	128.898	128.898
Kleibergen-Paap rk Wald F statistic		73.087	73.087	73.087

Note: This table reports the results of 2SLS estimation. FSE is overall financial system efficiency, FIE is financial institutions' efficiency and FME is financial markets' efficiency. Robust standard errors are in parentheses. \*, \*\*, and \*\*\* indicate level of significance at 10%,5% and 1% respectively.

resulting from the potential reverse causality between them, which would bias the fixed effect regression results. To address this issue, we use the Two-Stage Least Squares (2SLS) method and, following Shah, Shah, Smith, and Labianca (2017), we use the number of crimes per 10 million people in the country (Crime\_Rate) as an instrument for JE. The rationale for choosing this instrument is that the overall crime rate should be directly correlated with JE but not with FSE. We use this instrument throughout the study to control for endogeneity.

The 2SLS model is specified below:

$$FSE_{it} = \beta_0 + \beta_1 \overline{JE}_{it} + \beta_n X_{it} + \varepsilon_{it} \tag{Eq. (2)}$$

Where,  $\overline{JE}$  is the instrumented or predicted value of JE obtained from the first-stage regression using Crime\_Rate as the instrument variable. The remaining variables in Equation (2) are consistent with the definitions provided for Equation (1).

### 3.2. Variables and data

This study explores how JE affects FSE using a sample of 108 countries for the period from 2004 to 2020 (see Appendix A for the list of countries). Following Shah et al. (2017), JE, the main explanatory variable, is measured using two proxies from the World Bank's "Doing Business" database. These proxies are (i) JE\_Time which represents the number of days it takes to resolve a judicial case, from the initiation of

the case to implementation of the final court decision. We take the inverse of JE\_Time as a primary measure of JE, following Shah et al. (2017). The rationale for this approach is based on the assumption that speedier courts are preferable to slower ones, even if they incur higher costs; and (ii) JE\_Cost which quantifies the costs associated with a court trial, encompassing court fees, enforcement costs, and average attorney fees, as a percentage of the total amount claimed. This measure is used as an alternative proxy, for a robustness check.

FSE is the dependent variable in this study. To capture FSE comprehensively, we employ a recent index provided by the International Monetary Fund (IMF Sviryzdenka, 2016). This index measures financial efficiency using two components; one for FIE and another for FME. Both the FIE and FME indices have values that range from zero to one. Following the existing literature, we average the FIE and FME indices and rescale the result to a base of 100, obtaining an index that represents overall FSE. This method is similar to the one used in related studies such as Muhammad Atif Khan et al. (2022). By using this method, we aim to offer a comprehensive and reliable measure of FSE that is consistent with previous research efforts in this field. For further detail on this index please see (IMF Sviryzdenka, 2016).

We include several control variables in the model, namely economic growth (GDP\_PC), financial sector size (DC\_PC), governance quality (QoG), trade openness, financial openness, human capital, inflation, and government size. Economic growth is measured as GDP per capita (in constant 2015 USD), financial sector size is the amount of domestic credit in the private sector as a percent of GDP, and QoG is measured using governance quality index created using a principal component analysis on these six governance indicators: control of corruption, government effectiveness, political stability, regulatory quality, rule of law, and voice and accountability. Each indicator ranges from -2.5 to 2.5, where a higher score indicates stronger governance quality, and a lower score shows weaker quality. Trade openness is the total of all imports and exports as a percent of GDP, financial openness is measured as the ratio of foreign direct investment to GDP, human capital is proxied using the percent of gross primary school enrollment, inflation is the annual growth rate of the GDP implicit deflator which shows the rate of price change in the economy as a whole, and government size is proxied by government expenditures as a percent of GDP. We obtain data for these variables from the World Bank's World Development Indicators (WDI). Definitions and data sources for these variables are shown in Table 1.

## 4. Results and discussion

### 4.1. Baseline results

To analyze the effect of JE on FSE we use a regression with country and year fixed effects and robust standard errors as our baseline analysis. The results, reported in Table 2, show JE has a significant positive impact on overall FSE, as well as on its two components, FIE and FME. These findings are consistent with the theoretical and empirical literature that highlights the role of JE in reducing transaction costs, enhancing contract enforcement, protecting property rights, and fostering trust and confidence among market participants. For example, La Porta et al. (1998), Beck et al. (2003), and Levine (2005) show that countries with better legal systems have more developed financial markets and institutions, as they can mitigate the problems of asymmetric information, moral hazard, and adverse selection, and promote financial intermediation and innovation. Several empirical studies corroborate these arguments and support our results (for instance, see Cooray, 2011; Laeven & Majnoni, 2005; Shah et al., 2017).

This result provides compelling evidence that an efficient judicial system is a key driver of FSE. By fostering a conducive environment for economic transactions, an efficient judiciary lays the foundation for a resilient and flourishing financial sector, supporting sustainable economic growth. The positive effects of JE on FIE and FME further emphasize the importance of the judicial system in shaping specific

**Table 4**  
Effect of JE on FSE, FIE, and FME across income groups.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Income Group = LIC	Income Group = EM	Income Group = HIC	Income Group = LIC	Income Group = EM	Income Group = HIC	Income Group = LIC	Income Group = EM	Income Group = HIC
	FSE	FSE	FSE	FIE	FIE	FIE	FME	FME	FME
JE_Time	.051*** (.01)	.037*** (.012)	.061*** (.021)	.071*** (.017)	.045*** (.008)	.056*** (.013)	.029*** (.007)	0.044** (2.35)	0.034** (2.29)
GDP_PC	-.006 (.004)	.011 (.007)	.075*** (.021)	-.019** (.009)	-.002 (.005)	.011 (.01)	.01*** (.002)	.022 (.015)	.166*** (.044)
DC_PS	.038*** (.003)	.062*** (.009)	.039*** (.014)	.07*** (.006)	.02*** (.004)	.008 (.008)	-.003 (.002)	.112*** (.017)	.077** (.03)
QoG	.007 (.006)	.005 (.006)	.046** (.022)	.002 (.011)	.004 (.005)	.018* (.011)	.026*** (.004)	.01 (.012)	.118*** (.045)
Trade Openness	-.025*** (.005)	-.039*** (.013)	-.138*** (.015)	-.041*** (.009)	.013* (.007)	-.045*** (.008)	-.009*** (.004)	-.104*** (.025)	-.224*** (.032)
Financial Openness	-.002 (.002)	-.008* (.005)	.004 (.003)	-.005 (.004)	-.001 (.003)	.002 (.002)	0 (.001)	-.019* (.01)	.005 (.006)
Human Capital	.029** (.012)	-.24*** (.055)	.296*** (.073)	.037* (.021)	-.162*** (.028)	.051 (.046)	.011** (.005)	-.34*** (.107)	.557*** (.142)
Inflation	-.004*** (.002)	.007** (.003)	-.003 (.006)	-.011*** (.003)	0 (.002)	0 (.004)	.003*** (.001)	.017** (.006)	-.006 (.012)
Govt_Exp	-.042** (.02)	-.216*** (.041)	.144 (.092)	-.034 (.041)	-.091*** (.026)	-.041 (.044)	-.013 (.009)	-.364*** (.086)	.464** (.192)
Country fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	.007 (.138)	2.545*** (.405)	-2.29*** (.664)	.046 (.262)	1.817*** (.229)	.057 (.358)	-.18*** (.065)	3.471*** (.818)	-5.624*** (1.407)
Observations	392	751	381	392	751	381	392	751	381
Adj. R-squared	.404	.243	.526	.382	.169	.344	.291	.21	.481

Note: This table reports the results of fixed effect regression estimates with robust standard errors that are clustered at the country level across the various income groups. FSE is overall financial system efficiency, FIE is financial institutions' efficiency and FME is financial markets' efficiency. LIC, EM and HIC represent low-income countries, emerging economies and high-income countries respectively, Robust standard errors are in parentheses. \*\*\*p < .01, \*\*p < .05, \*p < .1.

**Table 5**  
Robustness test using alternative measure of JE.

	(1)	(2)	(3)
	FSE	FIE	FME
JE_Cost	.021** (.01)	.051*** (.015)	.036* (.019)
GDP_PC	.021** (.01)	.027** (.011)	.015 (.018)
DC_PS	.059*** (.005)	.04*** (.003)	.08*** (.01)
QoG	.017*** (.004)	.008** (.004)	.03*** (.008)
Trade Openness	-.003 (.011)	-.016 (.011)	.016 (.024)
Financial Openness	-.005** (.002)	-.002 (.001)	-.01** (.004)
Human Capital	-.065*** (.018)	0 (.016)	-.148*** (.033)
Inflation	-.001 (.002)	-.001 (.002)	.001 (.004)
Govt_Exp	-.056** (.026)	-.081*** (.019)	-.023 (.053)
Country fixed effect	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes
Constant	.848*** (.163)	.585*** (.144)	1.101*** (.323)
Observations	1524	1524	1524
R-squared	.579	.292	.522

Note: This table reports the result of fixed effect regression with robust standard errors estimation performed using alternative measure of JE. Robust standard errors are in parentheses. \*\*\*p < .01, \*\*p < .05, \*p < .1.

components of the financial sector. Effective judicial enforcement of contracts empowers financial institutions to allocate resources more efficiently and make informed lending decisions (Pezone, 2023). For

example, our results support findings in (Bae & Goyal, 2009; Laeven & Majnoni, 2005) that show the cost of financial intermediation for households and firms can be reduced by enhancing JE and the judicial enforcement of debt contracts. In sum, our results indicate that improving JE can enhance the efficiency of the financial system as a whole, as well as its main components: FIE and FME.

#### 4.2. 2SLS estimation

We apply 2SLS using the number of crimes committed per 10 million people in a country (Crime\_Rate) as an instrument for JE, following Shah et al. (2017). The results are reported in Table 3. The rationale for choosing this instrument is that overall, the crime rate is expected to be directly correlated with the JE but not with the FSE. As can be seen in Table 3, the first-stage regression shows that Crime\_Rate has a significant negative relationship with JE, confirming the validity of the instrument. The diagnostics statistics reported in Tables 3 and i.e., the Cragg-Donald F-statistic and Kleibergen-Paapr LM statistic, reinforce the validity of the instrument and bolster the reliability of our results.

The second-stage regression results confirmed our baseline findings and show that the instrumented JE positively affects FSE and its components, FIE and FME. These results are robust and support the presence of a causal relationship between JE and JSE and its components. The results imply that an efficient judicial system enhances FSE by facilitating contract enforcement, reducing information asymmetry, and increasing investor confidence. These factors improve the efficiency of financial intermediation and resource allocation by financial system, leading to better outcomes for households and businesses. A reliable judiciary helps financial institutions make better lending decisions, manage risks, and allocate resources more optimally. A robust judiciary also boosts the attractiveness of a country's financial markets by enhancing investor protections and reducing uncertainty. These qualities increase market liquidity, participation, and access to capital.

**Table 6**  
Robustness using additional control variables.

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	FSE	FIE	FME	FSE	FIE	FME
JE_Time	.019** (.009)	.09*** (.025)	.035* (.02)			
JE_Cost				.065** (.028)	.056*** (.016)	.053* (.028)
GDP_PC	.009** (.004)	.011*** (.003)	.032*** (.008)	.011** (.004)	.014*** (.004)	.038*** (.009)
DC_PS	.08*** (.005)	.051*** (.003)	.113*** (.01)	.081*** (.005)	.05*** (.003)	.115*** (.01)
QOG	.011** (.005)	.002 (.004)	.016 (.01)	.011** (.005)	0 (.004)	.018* (.01)
Trade Openess	-.081*** (.006)	-.017*** (.004)	-.153*** (.012)	-.083*** (.006)	-.016*** (.004)	-.159*** (.012)
Financial Openess	-.001 (.002)	-.003* (.001)	-.001 (.005)	-.002 (.002)	-.002 (.001)	-.002 (.005)
Human Capital	-.1*** (.016)	-.02 (.016)	-.2*** (.031)	-.097*** (.016)	-.013 (.016)	-.2*** (.029)
Inflation	-.002 (.002)	.001 (.002)	-.004 (.004)	-.002 (.002)	0 (.002)	-.003 (.004)
Govt_Exp	-.163*** (.028)	-.064*** (.022)	-.272*** (.057)	-.155*** (.028)	-.065*** (.022)	-.255*** (.056)
French legal origin	.001 (.006)	-.001 (.005)	.005 (.014)	.001 (.006)	.002 (.005)	.001 (.014)
Socialist legal origin	-.001 (.011)	.008 (.006)	-.009 (.022)	-.005 (.011)	.015** (.007)	-.022 (.023)
German legal origin	.02 (.015)	-.018** (.008)	-.02 (.012)	.016 (.015)	-.015** (.008)	-.005 (.007)
Scandinavian legal origin	.023* (.013)	-.002 (.009)	.056** (.025)	.018 (.013)	.005 (.009)	.038 (.025)
Latitude	.235*** (.021)	.076*** (.016)	.399*** (.039)	.235*** (.021)	.058*** (.017)	.416*** (.04)
Culture	.088*** (.012)	.03*** (.009)	.15*** (.025)	.084*** (.012)	.031*** (.008)	.141*** (.024)
Constant	1.575*** (.188)	.817*** (.161)	2.459*** (.384)	1.49*** (.168)	.515*** (.157)	2.541*** (.334)
Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1340	1340	1340	1340	1340	1340
R-squared	.654	.317	.595	.653	.328	.596

Note: This table reports the results of fixed effect regression estimation with robust standard errors that are clustered at country level performed using additional control variable to check the robustness of the main findings. Robust standard errors are in parentheses \*\*\*p < .01, \*\*p < .05, \*p < .1.

Therefore, we conclude that JE positively influences FSE. These findings highlight the critical role of a well-functioning judicial system in promoting financial growth and stability, and indicate that policymakers should prioritize initiatives to improve JE to create a favorable environment for a country’s financial ecosystem. The positive impact of JE on both JIE and FME demonstrates the multifaceted benefits of a strong judiciary for the health of the financial sector.

4.3. Heterogeneity analysis: income group classification

The sample used in our study is heterogeneous with respect to per capita income level. The literature shows that countries with different wealth levels have different financial systems and structures. Asongu (2012) argues that wealth affects both the quality of institutions environment and financial system operations. Richer countries can afford better institutions and have a greater demand for financial services than poorer countries. Therefore, we also delve into the relationship between JE and FSE across various per capita income groups. We categorize the sample into advanced, emerging, and low-income economies based on the International Monetary Fund’s (IMF’s) income group classification. The regression results shown in Table 4 for each subgroup consistently demonstrate that JE exerts a positive effect on overall FSE and its components, FIE and FME.

The positive impact of JE on FSE, FIE, and FME reinforces the significance of a well-functioning judicial system in nurturing a thriving financial ecosystem. An efficient judiciary enhances contract enforcement, reduces information asymmetry, and supports the growth of both

financial institutions and financial markets. Overall, our study contributes valuable insights to the literature by highlighting the universal positive effect of JE on FSE, FIE, and FME across diverse income groups. These findings, which are consistent across income groups, emphasize the critical role of a robust legal system in shaping the performance and efficiency of the financial sector, irrespective of the country’s per capita income level. Policymakers should focus on maintaining and further increasing JE to enhance FSE.

4.4. Robustness check

4.4.1. Alternative measure of JE

We test the robustness of our results using an alternative measure of JE to ensure that our results are not sensitive to the choice of the JE indicator. Following Shah et al. (2017), we use JE\_Cost instead of JE\_Time to measure JE. JE\_Cost is the total cost of contract enforcement as a percentage of the total claim amount. Table 5 reports the results of the regression using this alternative proxy. The positive and significant coefficients of JE\_Cost in columns 1–3 support our main findings and imply that the cost efficiency of a country’s judicial process is a key driver of its overall FSE and its components, FIE and FSE. The results of the robustness check strengthen the reliability of our main findings.

4.4.2. Robustness using additional control variables for both JE indicators

In this section, we extend our analysis by incorporating additional controls for FSE to further assess the robustness of our baseline findings. Specifically, we include variables for legal origin, culture, and

geography in our model, following Cooray (2011). Legal origin is the legal tradition of the company law or commercial code that each country inherits. In the model, this variable is equal to 1 for English Common Law, 2 for French Commercial Code, 3 for socialist/communist law, 4 for German Commercial Code, and 5 for Scandinavian Commercial Code. Data on legal origin is obtained from (R. La Porta et al., 1999) and the CIA Factbook. The religious fractionalization measure of Alesina et al. (2003) is used to measure culture, and the absolute latitude of a country is used to proxy its geography following Cooray (2011), with data sourced from the QoG standard data set. The results presented in Table 6 are in line with our baseline findings for both proxies of judicial efficiency, namely JE\_Time (columns 1–3) and JE\_Cost (columns 4–6). The consistency between the baseline and extended results reinforces the robustness of our findings, providing further support for the positive impact of JE on FSE.

### 5. Conclusion and policy recommendations

Financial system efficiency (FSE) is crucial in optimizing resource utilization and enhancing economic growth and development. It reflects the ability of a country’s financial sector to provide financial services to households and firms in a cost-effective manner. An efficient and well-functioning financial system enables efficient resource allocation, stimulates investment, and supports economic prosperity (Ro, Kim, & Kim, 2017; IMF Svirydzenka, 2016; Yu, Li, & Huang, 2017). This study examines the impact of JE on FSE and its two key components, FIE and financial markets’ efficiency in a global context. Our sample includes 108 countries, spanning the period from 2004 to 2020, selected to maximize the use of available data. We employed a fixed effect regression for our baseline analysis and 2SLS for our main analysis to address potential endogeneity concerns.

The results of our study unequivocally reveal a positive and significant effect of JE on FSE, FIE, and FME. These findings underscore the critical role of well-functioning and efficient judicial systems in shaping robust and efficient financial ecosystems worldwide. A strong judiciary

enhances contract enforcement, reduces information asymmetry, and fosters investor confidence, thereby promoting efficient financial intermediation and resource allocation. Our findings reinforce new institutional economics transaction cost theory and law and finance theory in the context of JE and FSE.

To explore whether per capita income heterogeneity affects these relationships, we divide the sample into income groups based on the IMF’s classification. We find that the positive effects of JE on FSE, FIE, and FME hold true across all income groups, validating the universal significance of JE in driving FSE, regardless of a country’s economic context. Additionally, we conducted robustness checks by using alternative proxies of JE and introducing additional control variables. The results of these tests further confirm the robustness and validity of our main findings, reinforcing the positive relationship between JE and FSE.

Our study offers important insights for policymakers, regulators, and other stakeholders. To achieve optimal economic growth and development, countries must prioritize implementing reforms to foster JE and enhance efficient contract enforcement mechanisms. By fostering FSE through efficient judicial processes, countries can unlock new opportunities for economic development. International organizations and development agencies play a crucial role in this endeavor by providing technical assistance and capacity building to countries seeking to improve their JE and FSE. Sharing best practices and knowledge among countries will further enhance FSE on a global scale. In conclusion, our study highlights the vital importance of JE in driving FSE across countries at diverse stages of economic development. Policymakers and stakeholders should leverage these findings to implement targeted JE reforms that foster FSE to help attain sustainable economic growth and prosperity.

### Acknowledgment

This paper was supported by the János Bolyai Research Scholarship of the Hungarian Academy of Sciences

## Appendix A

**Table A1**  
List of Sample Countries

Albania	Cambodia	Gambia, The	Korea, Rep.	Nigeria	Tajikistan
Algeria	Cameroon	Georgia	Kuwait	Norway	Tanzania
Argentina	Canada	Germany	Kyrgyz Republic	Oman	Thailand
Armenia	Chad	Ghana	Latvia	Pakistan	Togo
Australia	Chile	Greece	Lithuania	Panama	Tunisia
Austria	China	Guatemala	Luxembourg	Paraguay	Turkiye
Azerbaijan	Colombia	Guinea	Madagascar	Peru	Uganda
Bahrain	Congo, Dem. Rep.	Honduras	Malaysia	Philippines	Ukraine
Barbados	Congo, Rep.	Hungary	Mali	Poland	United Arab Emirates
Belarus	Costa Rica	India	Mauritius	Portugal	United Kingdom
Belgium	Croatia	Indonesia	Mexico	Qatar	United States
Benin	Denmark	Iran, Islamic Rep.	Mongolia	Romania	Uruguay
Bhutan	Dominican Republic	Ireland	Morocco	Russian Federation	Uzbekistan
Bolivia	Ecuador	Israel	Mozambique	Saudi Arabia	Zambia
Botswana	Egypt, Arab Rep.	Italy	Namibia	Senegal	
Brazil	El Salvador	Japan	Nepal	Spain	
Brunei Darussalam	Fiji	Jordan	Netherlands	Sri Lanka	
Bulgaria	Finland	Kazakhstan	New Zealand	Sweden	
	France	Kenya	Niger	Switzerland	

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