JOURNAL OF FINANCIAL AND QUANTITATIVE ANALYSIS Vol. 58, No. 5, Aug. 2023, pp. 2096–2130

doi:10.1017/S0022109022001144

The Role of Creditor Protection in Lending and Tax Avoidance

Antonio De Vito
IE University IE Business School
antonio.de.vito@ie.edu

Martin Jacob
WHU – Otto Beisheim School of Management
martin.jacob@whu.edu (corresponding author)

Abstract

We examine how creditor rights affect the trade-off between non-debt and debt tax shields. Using four bankruptcy reforms and a panel of private and public firms from Italy, we show that laws empowering creditors reduce tax avoidance and increase debt financing, consistent with firms substituting non-debt tax shields with debt tax shields. We corroborate the validity of our findings using a panel of public firms across 33 countries. Additionally, we document that the impact of creditor protection laws is mitigated by tax system characteristics, which significantly reduce the incentives to substitute tax avoidance with debt.

I. Introduction

Whether and how firms trade off debt and non-debt tax shields to reduce the tax burden is a central question in economics, finance, and accounting since this trade-off is key for business decisions (e.g., DeAngelo and Masulis (1980), Bradley, Gregg, and Han Kim (1984), Graham (2000), Kemsley and Nissim (2002), Kahle and Shastri (2005), Graham and Leary (2011), and Doidge and Dyck (2015)). Trade-off models suggest that non-debt tax shields could substitute for interest expense, thereby diluting the tax benefit associated with debt. There are various non-debt tax shields, ranging from perfectly legal provisions (e.g., accelerated tax depreciation or investment tax credits) to more aggressive tax avoidance strategies (i.e., tax shelters).

Previous studies have found that firms use less debt when engaging in tax sheltering, suggesting that non-debt tax shields could substitute for debt tax shields (Graham and Tucker (2006)). This evidence, however, abstracts away from any regulatory dimension that could affect the trade-off between debt and non-debt tax

We are especially grateful to two anonymous referees, Mara Faccio (the editor), Pedro Gete, Marc Goergen, Juan-Pedro Gómez, Emanuele Rizzo (discussant), Burcin Yurtoglu, conference participants at the 2019 Finance Forum, and seminar participants at IE Business School, Pompeu Fabra University, and WHU–Otto Beisheim School of Management for many helpful comments. Antonio De Vito acknowledges that the research reported in this article was partially funded by the Ministry of Economy and Competitiveness of Spain, the State Research Agency, and European Regional Development Fund Grant No. PGC2018-101745-A-I00. Martin Jacob acknowledges funding by the German Research Foundation (*Deutsche Forschungsgemeinschaft*) Project-ID 403041268 – TRR 266 Accounting for Transparency.

shields. Since different legal regimes and changes to regulation greatly shape the business environment in which firms operate (Baginski, Hassell, and Kimbrough (2002), Houston, Lin, Liu, and Wei (2019)), it is vital to understand the role institutional factors play in capital structure choices (Haselmann, Pistor, and Vig (2010)) and corporate tax decisions (Wilde and Wilson (2018)).

In this article, we contribute to the literature by examining the role of creditor protection in shaping the trade-off between debt and non-debt tax shields. In particular, we study whether creditor protection laws encourage firms to substitute corporate tax avoidance with debt financing, and how the interaction between creditor protection laws and tax system characteristics affects the incentives to substitute tax avoidance with debt. A thorough understanding of these issues is essential since corporate tax avoidance still represents a major concern for many countries (OECD (2020)). Moreover, to date, the effect of creditor rights on tax avoidance is still unknown, and the effect on debt is far from fully settled (e.g., La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1997), (1998), Djankov, McLiesh, and Shleifer (2007), Acharya, Amihud, and Litov (2011), and Qi, Roth, and Wald (2017)). We attempt to link the literature on law and finance, capital structure, and tax avoidance by investigating these important issues.

From a theoretical perspective, the effect of creditor rights on debt financing and tax avoidance is ambiguous. On the one hand, the law and finance literature (Levine (1997), (1998), (1999), Demirgüç-Kunt and Maksimovic (1998), (1999), La Porta et al. (1998), and Djankov et al. (2007)) posits that stronger creditor rights promote financial development and foster economic growth. This line of research, that is, the supply-side view, suggests that, when lenders can more easily force repayment, grab collateral, or even gain control of the firm, they are more willing to extend credit, which, in turn, increases the debt capacity of firms (Beck, Demirgüç-Kunt, and Levine (2003a), (2003b)). In line with this reasoning, Giannetti (2003) finds that firms located in countries with stronger creditor rights exhibit higher debt ratios. By taking on more debt, firms can substitute non-debt tax shields, such as costly tax avoidance (McClure (2020)), with debt tax shields to reduce the tax burden (Miller (1977), DeAngelo and Masulis (1980)). Therefore, firms are expected to rely more on debt financing and less on tax avoidance when creditor rights are stronger. Conversely, the demand-side view suggests that stronger creditor power against defaulting debtors has a negative effect on firms' use of debt. This line of research argues that strong creditor protection deters managers and shareholders from using debt because of excess liquidation risk and the fear of losing control upon default (Acharya and Subramanian (2009), Acharya, Amihud, and Litov (2011), Acharya, Sundaram, and John (2011), and Vig (2013)). Therefore, firms are expected to use less debt financing (i.e., fewer debt tax shields) and avoid more taxes (i.e., more non-debt tax shields) to reduce the tax burden when creditor protection is stronger.

To answer our primary research question, we exploit four bankruptcy reforms that led to changes in the strength of creditor rights in Italy over the period of 2003 to 2011. We use this setting since it enables us to make causal inferences about the effect of creditor rights on debt financing and tax avoidance for the following reasons. First, in 2005, the Italian Parliament enacted a major bankruptcy reform that entirely replaced the 1942 Bankruptcy Code. This law was motivated by the

Parmalat scandal in Dec. 2003 and was unrelated to the business cycle or other macroeconomic trends (Rodano, Serrano-Velarde, and Tarantino (2016), Favara, Morellec, Schroth, and Valta (2017)). Second, the new bankruptcy law was unanticipated, and the entire legislative process proved to be fast since it lasted only 4 months (from Dec. 2004 to Apr. 2005). Furthermore, in subsequent years, the Italian Parliament amended the 2005 Bankruptcy Code 3 times, allowing us to exploit each amending reform as a source of time variation. Moreover, although creditors have the same rights to resort to a bankruptcy court in the event of default, the enforcement of a debt contract varies significantly within Italy. In this regard, Jappelli, Pagano, and Bianco (2005) show large differences across provinces in the efficiency of bankruptcy courts. These differences, in turn, affect the ex-ante availability of credit for firms. Crucial to our identification, these differences do not reflect the north–south division that is typical of Italy but are related to the administration of justice, which is centralized and independent of the legislative power. These features ultimately create a quasi-random distribution of judges' abilities and efforts within the country. Furthermore, unlike other countries, in Italy, the Bankruptcy Code prevents firms from strategically relocating for judicial reasons.

To assess the cumulative effect of the bankruptcy reforms, we proceed in two steps. First, we follow the methodology of La Porta et al. (1998) and construct a creditor rights index for Italy. This index is very granular and varies continuously within the range of 0 and 4, with higher scores indicating stronger creditor rights. Second, consistent with the efficiency of bankruptcy courts shaping the ex-ante availability of credit within the country, we divide the sample into firms with high and low debt enforcement based on the number of bankruptcy proceedings days in each province within the same region in 2003 (i.e., the first year of our sample period). We thus effectively compare the debt and tax avoidance responses around the bankruptcy reforms (first difference) of firms facing the same local economic conditions but exposed to different levels of debt enforcement (second difference).

We empirically document a positive effect of creditor rights on debt financing. Specifically, we find that firms in provinces with strong debt enforcement significantly increase their debt ratios relative to firms in provinces with low debt enforcement when creditor rights are stronger. This effect is economically sizable: our analyses indicate that a 1-standard-deviation increase in the creditor rights index increases the debt ratio by around 0.23%. We also find that firms in provinces with strong debt enforcement have significantly higher effective tax rates (ETRs) by about 0.19% for a 1-standard-deviation increase in the creditor rights index. Importantly, we find that future creditor protection changes are unrelated to current debt and tax avoidance, supporting the parallel trends assumption underlying our approach. Collectively, these results are in line with the supply-side hypothesis and suggest that, when creditor rights are stronger, firms in provinces with strong debt enforcement substitute away from tax avoidance toward debt financing. Furthermore, these results emphasize that a given level of debt enforcement reinforces the effect of creditor protection laws in shaping financial relationships in general and debt contracting in particular.

We corroborate this interpretation in a supplemental analysis and find that firms in provinces with strong debt enforcement significantly increase interest payments as creditor protection becomes stronger, consistent with firms using debt

tax shields to reduce the tax burden. Finally, to mitigate identification concerns, we perform several robustness tests and show that the results are robust to variations and combinations of clustering methods, estimation techniques, and aggregate regional-level analyses where we use the corporate tax returns of all incorporated firms in Italy.

Our analyses using the Italian setting allow us to draw inferences about the causal effect of creditor rights on debt and tax avoidance. However, despite the high internal validity of this setting, the evidence is limited to one country. Moreover, the Italian setting does not allow us to exploit variation in tax system characteristics. We, therefore, generalize these results by exploiting changes in creditor rights across 33 countries staggered in time from 2004 to 2013. We control for observable economic, legal, and enforcement conditions and limit the counterfactuals to firms from the same industry. In aggregate country-level analyses, we first document a positive relation between the strength of creditor rights and the size of the credit market, as well as between the strength of creditor rights and corporate tax revenue. While the former association is in line with the finding of previous supply-side studies (La Porta et al. (1997), (1998), Djankov et al. (2007)), the latter evidence is new and indicates that stronger creditor protection reduces aggregate tax avoidance and increases aggregate corporate tax revenue.

We then continue with firm-level analyses and find average debt and tax avoidance responses of similar magnitude in a sample of 12,052 listed firms. We employ a cross-country firm-level analysis since it allows us to examine cross-sectional variables that also match the underlying construct of the debt and tax avoidance responses: the trade-off between debt and non-debt tax shields. In this regard, we are able to shed light on the interaction between creditor rights laws and tax system characteristics and to show that the decision to substitute tax avoidance with debt is the result of the incentives provided by both creditor protection laws and tax laws. On the one hand, creditor protection laws encourage lenders to extend credit and firms to use debt tax shields. On the other hand, provisions in a country's tax code can reduce the value of debt tax shields as substitutes of non-debt tax shields. To address the issue, we explore cross-country differences in the degree of deductibility of financing costs. Firms that are located in countries with higher deductibility of financing costs – that is, where the deduction of interest on internal debt is not limited, when a notional interest deduction on equity is allowed (e.g., in Belgium), or when tax-loss carrybacks and tax-loss carryforwards are available – are expected to have fewer incentives to substitute non-debt tax shields with debt tax shields as creditor protection becomes stronger.

We collect data on a broad set of tax law items (thin capitalization rules, loss offset rules, allowances for corporate equity) and combine them into an overall index that ranges from 0 (low deductibility) to two (high deductibility) to measure the degree of deductibility of financing costs. We find that the effect of creditor rights on debt financing and tax avoidance is weaker in countries with higher levels of deductibility of financing costs than in those with lower levels. Additionally, we find that the debt and tax avoidance responses to stronger creditor rights are weaker in countries with lax tax enforcement or a low statutory tax rate. This evidence indicates that tax system characteristics might not always make it convenient for firms to substitute away from tax avoidance toward debt financing when creditor

rights are stronger. In sum, having established the causal effect using the Italian setting, we leverage the changes in creditor rights from many countries and are able to provide external validity to our main findings.

Altogether, while prior studies provide evidence that firms trade off debt and tax avoidance, they do not consider the regulatory environment or, in particular, the legal institutions that could affect such a trade-off (Graham and Tucker (2006), Lin, Tong, and Tucker (2014)). We show that the strength of creditor rights increases debt and reduces corporate tax avoidance in economically meaningful ways. Moreover, we show that the debt and tax avoidance effects are greatly mitigated by tax system characteristics. This evidence highlights the institutional interdependencies among different sets of rules and contributes to the literature that examines the effect of the regulatory environment on firms' tax avoidance (Atwood, Drake, Myers, and Myers (2012), De Simone (2016), and Shevlin, Thornock, and Williams (2017)). Contrary to the previous studies, we focus on both the debt and tax avoidance responses and emphasize the role of multiple tax system characteristics and their interactions with creditor protection laws in shaping the trade-off between debt and non-debt tax shields. In this regard, our article is also related to studies that examine the effect of legal institutions on external financing (e.g., Laeven and Majnoni (2005), Hail and Luez (2006), Qi et al. (2017), Cumming, Lopez-de-Silanes, McCahery, and Schwienbacher (2020), and El Ghoul, Guedhami, Kwok, and Zheng (2021)).

Furthermore, our results have implications for the ongoing debate among OECD/G20 countries on protecting corporate income tax bases against corporate tax avoidance (OECD (2013a), (2013b), (2015a), (2019a)), which could be particularly relevant given the current crisis and the role of taxation in dealing with COVID-19.[1] We contribute to this discussion by providing evidence of the effect of creditor protection laws on tax avoidance while simultaneously taking into account tax system characteristics, which is arguably more realistic than an analysis of single rules in isolation. Our findings emphasize the importance of the deterrent effect of creditor protection laws on corporate tax avoidance; however, their effect should be examined in conjunction with tax laws. Therefore, creditor protection laws should be featured more prominently in policy debates on effective mechanisms against corporate tax avoidance.

II. Theoretical Background and Hypothesis Development

Our research question to determine whether creditor protection shapes the trade-off between debt and non-debt tax shields is motivated by a vast body of literature that advocates the positive effect of legal institutions on financial market development and economic growth (e.g., La Porta et al. (1997), (1998), Levine (1997), (1998), (1999), Demirgüç-Kunt and Maksimovic (1998), (1999),

[1] "The current crisis is a global challenge that requires a global response. International tax cooperation must be part and parcel of a set of effective and well-coordinated multilateral actions to respond to the crisis. In order to expand the fiscal space, it is more urgent than ever to work together to fight tax evasion and tax avoidance" ("Facing the crisis: The role of tax in dealing with COVID-19," International Monetary Fund, June 16, 2020).

Castro, Clementi, and MacDonald (2004), Djankov et al. (2007), and Cumming, Filatotchev, Knill, and Senbet (2017)). One important mechanism through which legal institutions have an influence is the way that stronger creditor protection mitigates agency conflicts between shareholders and debt holders and facilitates access to costly external finance.[2] In particular, Djankov et al. (2007), Qian and Strahan (2007), and Bae and Goyal (2009) focus on creditor protection laws and show that these laws increase credit availability. This line of research (the supply-side view) shows that strong creditor protection encourages lenders to extend credit since they can expect greater creditor protection during bankruptcy and reorganization events.

Alternatively, stronger creditor rights could encourage lenders to accelerate payments and provide incentives to force liquidation in bankruptcy. Acharya and Subramanian (2009), Acharya, Amihud, and Litov (2011), Acharya, Sundaram, and John (2011), and Vig (2013) focus on the excessive liquidation risk induced by strong creditor rights. In countries where bankruptcy codes are more creditor-friendly, firms are less willing to invest in innovation, undertake less risky acquisitions, and use less debt. This line of research (the demand-side view) suggests that stronger creditor rights can lead firms to use less debt financing because of the excess liquidation risk and the fear of shareholders and managers losing control in the case of financial distress. Consistent with the demand-side view, Rajan and Zingales (1995) argue that strong creditor rights commit lenders "to penalizing management (and equity holders) if the firm gets into financial distress, thus giving management strong incentives to stay clear of it" (p. 1444).

In addition to these effects on debt, we are interested in the effect of creditor rights on tax avoidance. Since debt and tax avoidance are substitutes (Graham and Tucker (2006), Lin et al. (2014)), stronger creditor rights could lead firms to rely more (less) on debt financing and, in turn, reduce (increase) incentives to avoid taxes. In line with this reasoning, trade-off models suggest that capital structure is determined by balancing the tax benefits of debt with the deadweight losses in bankruptcy (DeAngelo and Masulis (1980)). Since non-debt tax shields, which are a form of corporate tax avoidance, can substitute for debt tax shields, such as the deduction of interest expenses in tax returns, they could reduce the marginal benefit of using debt financing.

In sum, we argue that the ability of the supply- and demand-side forces to shape the trade-off between debt and non-debt tax shields can be captured by the sign and significance of the effect of creditor protection on debt financing and tax avoidance. In particular, the supply-side (demand-side) view predicts that creditor protection increases (reduces) the use of debt financing and reduces (increases) the incentives to avoid taxes. The combination of the above arguments leads us to propose the following competing hypotheses:

Hypothesis 1. If the supply-side view in the debtor–creditor relationship dominates, stronger creditor rights have a positive effect on the use of debt and reduce the incentives to avoid taxes.

[2]The agency conflicts between equity holders and debt holders include moral hazard problems such as excessive payouts to shareholders, claim dilution, asset substitution, risk shifting, and underinvestment (see, e.g., the seminal works of Fama and Miller (1972), Jensen and Meckling (1976), and Myers (1977)).

Hypothesis 2. If the demand-side view in the debtor–creditor relationship dominates, stronger creditor rights have a negative effect on the use of debt and increase the incentives to avoid taxes.

III. Research Design and Data

A. Exploiting Italian Bankruptcy Reforms

We exploit four bankruptcy reforms in Italy that changed the strength of creditor rights. The features of these Italian bankruptcy reforms are useful for examining the effect of creditor rights on debt and tax avoidance since we can link them to our theoretical framework, and the multiple reforms allow us to mitigate standard identification concerns arising from the endogeneity of creditor rights for the following reasons. First, in 2005, the Italian Parliament enacted a major bankruptcy reform that replaced the 1942 Bankruptcy Code. In the spirit of U.S. Chapter 11, this law made debt renegotiations easier for debtors (Favara et al. (2017)). The law was motivated by the Parmalat scandal in Dec. 2003 and was unrelated to general economic trends. Before the change, the European Court of Justice had repeatedly exhorted Italy to reform the 1942 Bankruptcy Code since it was violating European law (Lo Cascio (1999)); however, no legislative action had been taken. Second, the enactment of the new bankruptcy law proved to be fast and largely unanticipated by banks, firms, and the media. In Dec. 2004, the Italian government presented a draft of the reform to Parliament that was approved just 4 months later in Apr. 2005. Third, in the following years, the 1942 Bankruptcy Code was amended multiple times by the Italian Parliament and government, allowing us to exploit further each amendment as a source of time variation to analyze the effect of creditor rights on debt and tax avoidance.

Together, these reforms provide creditors and debtors with four proceedings to resolve bankruptcy. These proceedings are private debt restructuring between debtors and creditors (which provides creditors with the least protection), debt restructuring approved by the court, reorganization, and liquidation (which gives creditors the right to control the bankruptcy process and to sell the company or its assets on a piecemeal basis to repay outstanding debts).

To assess the cumulative effect of the bankruptcy reforms, we follow La Porta et al. (1998) and construct a continuous creditor rights index. Starting in 2003, for each bankruptcy reform, we identify 10 main features of creditor rights and analyze their effect on each of the four bankruptcy proceedings. Specifically, in addition to the four main features of creditor protection identified by La Porta et al. (i.e., control rights, creditor approval, automatic stays, and the dilution of secured credits), we analyze each bankruptcy reform and identify six additional features that grant protection to creditors (i.e., creditors' committee, court supervision, bankruptcy administrator, moratoria, super-priority financing, and cramdown provisions). For each of the four bankruptcy proceedings, we assign the value of $+0.1$ (i.e., up to $+1$ for the 10 main features of creditor protection) if the bankruptcy code strengthens creditor rights in year t, or -0.1 (i.e., up to -1 for the 10 main features of creditor

protection) if the bankruptcy code weakens creditor rights. Following this approach, we construct four continuous subindexes ranging from 0 to 1 for each of the bankruptcy proceedings. Finally, since the bankruptcy proceedings are a continuum that the debtor and creditors can access, we combine the four subindexes into one creditor rights index. This allows us to create a very granular creditor rights index that varies continuously between 0 and 4, with higher scores indicating stronger creditor rights. Table 1 summarizes the 10 main features of creditor protection in 2011 (Panel A), the bankruptcy reforms and their sign over the sample period, and the comprehensive creditor rights index for each sample year (Panel B).[3] These reforms increased or reduced creditor rights, with a general decline in protection.

Another feature that makes Italy suitable for our analyses relates to the enforcement of bankruptcy law. Although the bankruptcy code gives all creditors the same rights to resort to a bankruptcy court against a defaulting debtor, the enforcement of a debt contract varies significantly within the country. In this regard, Jappelli et al. (2005) show large differences across Italian provinces in the efficiency of bankruptcy courts that affects debt enforcement and the availability of credit for firms. Figure 1 displays the length of bankruptcy proceedings across 103 provinces in 2003 using the bankruptcy data from the Italian National Institute of Statistics (ISTAT). Similar to Jappelli et al. (2005), we observe meaningful variation across provinces in the administration of bankruptcy law.[4] Importantly, this heterogeneity does not reflect the north–south division that is typical of Italy.[5] Rather, it is due to organizational and administrative procedures that ultimately create a quasi-random distribution of judges' abilities and efforts within the country. Finally, it is also worth highlighting that the Italian Bankruptcy Code prevents firms from strategically relocating for judicial reasons (i.e., so-called forum shopping; see Gennaioli and Rossi (2010)).[6]

Overall, this setting allows us to adopt a within-country perspective to study the effects of multiple creditor rights reforms over time.[7] This setting also provides us with within-country differences in debt enforcement and two potential groups of firms: firms that are potentially more affected by stronger creditor rights, as they are

[3]Supplementary Material Section 1 provides a detailed description of each reform and how it changes our creditor rights index. Moreover, Supplementary Material Figure A1 and Supplementary Material Table A1 describe the approval process of each reform.

[4]Anecdotal evidence also suggests that court inefficiency is very high in Italy. *The Wall Street Journal* reports: "The notoriously slow pace of Italian justice is a towering problem for Italy's economy… The inefficiency of the Italian judicial system is hurting the Italian economy at unbearable levels… For instance, the length of credit recovery procedures is a particular disadvantage for Italian banks, making it hard for them to recoup debts" ("Renzi Takes Aim at Italy's Slow Courts," *The Wall Street Journal*, Aug. 27, 2014).

[5]For example, in the region of Liguria, in the north of Italy, it takes much more time to enforce a debt contract than it does in Sicily, in the south of Italy.

[6]For example, Ayotte and Skeel (2004) and LoPucki (2005) find that, in the United States, around 60% of the large Chapter 11 cases between 1980 and 2005 can be classified as forum shopping.

[7]Contrary to a cross-country perspective (e.g., Djankov et al. (2007), Davidenko and Franks (2008)), a within-country perspective allows us to hold constant other institutional characteristics that could affect the design and availability of financial contracts, as well as a firm's capital structure and tax avoidance decisions.

TABLE 1

Bankruptcy Reforms and Creditor Rights Index in Italy

Table 1 presents the 10 main features of creditor rights for each bankruptcy proceeding in 2011 (Panel A), as well as the bankruptcy reforms and the creditor rights index (CR) for the Italian setting from 2003 to 2011 (Panel B). The signs – and + indicate that creditor protection decreases and increases, respectively.

Panel A. Creditor Rights and Bankruptcy Proceedings

Feature	Private Debt Restructuring	Debt Restructuring Approved by the Court	Reorganization	Liquidation
Control rights	Debtor	Debtor	Creditors	Creditors
Creditor approval	No	60% of creditors	51% of creditors	No
Automatic stay	No	Yes	Yes	Yes
Dilution of secured creditors	No	No	Yes	Yes
Creditors' committee	No	No	Yes	Yes
Court supervision	No	No	Yes	Yes
Bankruptcy administrator	No	No	Yes	Yes
Moratoria	No	Yes	Yes	Yes
Super priority financing	Yes	Yes	Yes	No
Cramdown provision	No	No	Yes	Yes

Panel B. Bankruptcy Reforms and the Creditor Rights Index

Year	Reform	Description	Sign	Cr Index
2003	No reform	No reform	No reform	3.7
2004	No reform	No reform	No reform	3.7
2005	Decree No. 35	Private debt restructuring and reorganization	–	3.4
2006	Law No. 5	Liquidation	+	3.6
2007	No reform	No reform	No reform	3.6
2008	Decree 169	Debt restructuring approved by the court	–	3.5
2009	No reform	No reform	No reform	3.5
2010	Law No. 122	Debt restr. approved by the court and reorg.	–	3.2
2011	No reform	No reform	No reform	3.2

located in provinces where debt enforcement is stronger and the ex-ante lenders' willingness to extend credit is higher; and firms that are less affected by the reforms, as they are located in provinces where debt enforcement is weaker and the ex-ante lenders' willingness to extend credit is lower. Therefore, we identify the effect of creditor rights in this setting by comparing changes in debt and tax avoidance around the bankruptcy reforms (first difference) across firms in more and less affected provinces (second difference).

B. Data, Estimation Strategy, and Descriptive Statistics

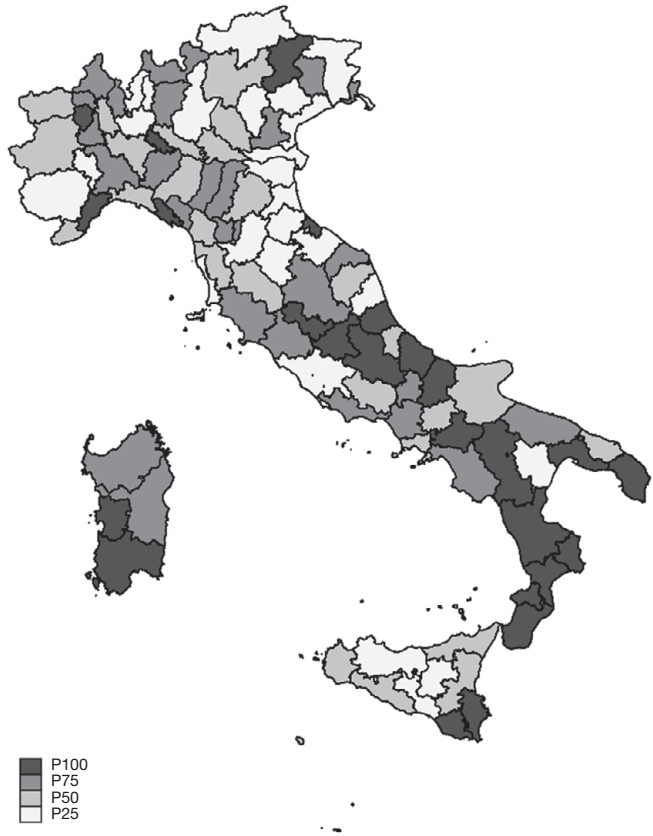
We use all available data on Italian firms from Bureau van Dijk's Amadeus database over the period of 2003 to 2011.[8] Similar to Giannetti (2003), we use Amadeus' unconsolidated financial statements of listed and unlisted firms, with exact information on the address of each sample firm. Unconsolidated balance sheet data enable us to identify the location of the activities of a single firm. In contrast, consolidated balance sheet data, for example, as provided in Compustat Global, do not allow us to identify exactly the location of firms' activities within the country (e.g., the province and the bankruptcy court the firm belongs to), as consolidated balance sheets comprise information pertaining to many firms consolidated into one

[8]Our sample ends in 2011 since in 2012, the Italian Parliament enacted a tax reform (i.e., the *Decreto Fiscale*) that significantly changed how firms compute taxable income.

FIGURE 1

Length of Bankruptcy Proceedings Across Italian Provinces

Figure 1 shows the distribution of the length of bankruptcy proceedings across 103 Italian provinces. The bankruptcy proceedings are based on court data aggregated at the province level in 2003. Darker provinces correspond to longer durations (the data are available on an annual basis at the province level at http://dati.istat.it).



economic group. In our analysis, we require firms to report information on fixed assets, pretax profits, cash holdings, leverage, and assets. We exclude observations with negative total assets, pretax profits, and cash. All financial variables are expressed in Euro. These requirements result in 341,217 firms and 940,361 observations distributed across the 20 Italian regions and covering around 10% of the Italian population of firms and around 50% of incorporated firms.

Using the postal code of each firm, we then merge unconsolidated balance sheet data with the bankruptcy proceeding durations of each Italian province.[9] Next, we follow Schiantarelli, Stacchini, and Strahan (2020) and apply the formula adopted by the Italian Ministry of Justice and ISTAT to compute the province-level indicators on the length of bankruptcy proceedings. The length of bankruptcy proceedings is an inverse measure of efficiency and is defined as:

[9]Supplementary Material Section 2 provides a detailed description of the data set construction.

$$D_t = \frac{P_t + P_{t+1}}{E_t + F_t} \times 365, \tag{1}$$

where D_t is the time to resolve a bankruptcy proceeding (in days), P_t (P_{t+1}) is the number of pending cases at the beginning (end) of the year, F_t is the number of new cases filed during the year, and E_t is the number of cases ending with a judicial decision during the year. Subsequently, we construct treatment and control groups based on the length of bankruptcy proceedings D_t. In particular, we define the treatment group (HIGH_ENFORCEMENT = 1) as the firms located in a province with strong debt enforcement whose number of bankruptcy proceedings days is below the median of days across the 103 provinces in 2003, and 0 otherwise. We define the two groups at the beginning of the sample period, as low economic growth rates in some geographic areas and the financial crisis of 2007–2008 could have pushed firms into bankruptcy and, in turn, clogged up the courts and increased D_t.[10] We then estimate the following model:

$$\begin{aligned} y_{i,k,t+1} = {} & \alpha_0 + \beta_1 \mathrm{CR}_t \times \mathrm{HIGH\_ENFORCEMENT}_{k,2003} \\ & + \beta_2 X_{i,t} + \beta_3 \mathrm{GDP}_{k,t} + \upsilon_i + \varphi_l \times \omega_t + \varepsilon_{i,t}, \end{aligned} \tag{2}$$

where $y_{i,k,t+1}$ is, alternatively, BOOK_LEVERAGE or GAAP_ETR for firm i in province k and year $t + 1$.[11] We compute BOOK_LEVERAGE as total debt (short- and long-term debt) scaled by total assets.[12] Following previous studies (e.g., Dyreng, Hanlon, and Maydew (2008), (2010)), we define GAAP_ETR as income taxes divided by pretax income. We winsorize GAAP_ETR at 0 and 1. The variable CR is a continuous creditor rights index ranging from 0 to 4, as defined above. The main variable of interest is the interaction term between CR and HIGH_ENFORCEMENT, which reflects the generalized difference-in-differences coefficient. Our theory yields two competing hypotheses on how creditor rights, debt, and tax avoidance relate to each other. We do not have clear ex-ante expectations for the sign of β_1, as firms in provinces with stronger debt enforcement could have either higher ($\beta_1 > 0$, consistent with the supply-side view in Hypothesis 1) or lower ($\beta_1 < 0$, consistent with the demand-side view in Hypothesis 2) debt ratios and ETRs when creditor rights are stronger. Our specification controls for firm fixed effects (υ_i) and region–year fixed effects $(\varphi_l \times \omega_t)$. The latter set of fixed effects enables us to compare treated firms with control group firms in the same region, which differ only by debt enforcement but are otherwise subject to the same local

[10] In Supplementary Material Table A2, we verify whether the length of bankruptcy proceedings is associated with local economic conditions. In OLS regressions without fixed effects, we find some correlation between these two variables. However, the correlation disappears when we include region-year fixed effects in our model, suggesting that the remaining variation in the length of bankruptcy proceedings is likely due to court inefficiency.

[11] Since firms could adjust their capital structure slowly (Fama and French (2012), Heider and Ljungqvist (2015)), we assess whether creditor rights affect capital structure or tax avoidance in the year after the change in creditor rights.

[12] Note that listed firms constitute a very small proportion of the firms in the sample. Therefore, only book values are available, and the market values of debt ratios cannot be evaluated.

TABLE 2

Summary Statistics: Italian Setting

Table 2 reports summary statistics for the main variables in the regression models. The sample comprises 940,361 firm-year observations of Italian industrial firms from Amadeus. All non-indicator variables, except for province-level variables, are winsorized at the first and 99th percentiles. Appendix A provides the variable definitions.

Variables	No.	Mean	Std. Dev.	25th Percentile	Median	75th Percentile
Dependent variables						
BOOK_LEVERAGE	940,361	0.5963	0.2700	0.3996	0.6433	0.8213
TOTAL_INTERESTS	940,361	0.0126	0.0128	0.0024	0.0086	0.0189
GAAP_ETR	940,361	0.5262	0.2858	0.3420	0.4696	0.7487
TAXES_PAID	940,361	0.0409	0.0774	0.0094	0.0213	0.0450
Creditor rights indicator						
CR	940,361	3.3148	0.1500	3.2000	3.2000	3.5000
HIGH_ENFORCEMENT	940,361	0.4995	0.5003	0.0000	0.0000	1.0000
Firm-level variables						
FIRM_SIZE	940,361	13.6082	1.5422	12.5388	13.5376	14.5880
INTANGIBLES	940,361	0.0349	0.0871	0.0000	0.0035	0.0243
INCOME	940,361	0.1483	0.1751	0.0559	0.0959	0.1704
PPE	940,361	0.3509	0.3818	0.0700	0.2183	0.5368
SALES_GROWTH	940,361	0.1145	0.6719	−0.0854	0.0354	0.2056
INVESTMENT	940,361	0.0691	0.1895	0.0034	0.0177	0.0568
CASH	940,361	0.1437	0.2436	0.0088	0.0495	0.1737
Z_SCORE	940,361	1.9077	1.1399	1.11823	1.7433	2.4492
Province-level variables						
GDP per capita	940,361	10.1907	0.2642	10.0605	10.2681	10.3353
Standard errors clusters	Number of firm-year observations					
BANKRUPTCY_COURTS	29	32,426.24	41,847.85	5,971.00	14,261.00	51,634.00
PROVINCE	97	9,694.44	16,808.65	2,806.00	4,585.00	9,343.00
FIRM	341,217	2.7600	0.7426	2.0000	3.0000	3.0000

economic and institutional environment.[13] For example, firms from Bari, Brindisi, Foggia, Lecce, and Taranto are all located in the Apulia region, but they differ with respect to the province they belong to and the related debt enforcement. We add the vector ($\mathbf{X}_{i,t}$) of firm-level variables, which includes firm size; intangibles; income; property, plant, and equipment (PPE); sales growth; investment; and cash. Furthermore, we control for the level of economic development of the province with gross domestic product (GDP) per capita (GDP per capita). The coefficients on CR and HIGH_ENFORCEMENT are not included in the regression since they are either firm- or time-invariant and are absorbed by the fixed effects. The statistical inference is based on robust standard errors clustered at the appellate bankruptcy court level.[14] Appendix A provides the variable definitions.

Table 2 reports descriptive statistics for our variables using the full sample of 940,361 observations. The average GAAP_ETR value is 53%, which is consistent with Italy being a high-tax country (OECD (2019b)). The BOOK_LEVERAGE value is also high (around 60%) by international comparison (De Socio and Finaldi Russo (2016)), but it compares favorably with the findings of previous studies

[13]Our fixed effects structure also controls for changes in tax enforcement. Nonetheless, we further investigate the role of tax enforcement in Supplementary Material Section 3 and in Supplementary Material Figures A2 and A3.

[14]Standard errors are clustered at the appellate court level, as this court has judicial, organizational, and administrative power over the bankruptcy tribunals within the province. This power extends to judges' appointments to bankruptcy proceedings. Note, however, that the results are robust to alternative clustering methods.

(Rodano et al. (2016)). Firms hold 14% as cash and short-term equivalents and 35% of the prior year's total assets in PPE, and their return on assets (INCOME) is around 15%.

IV. Results

A. Baseline Results

Table 3 reports the results. In column 1, we use BOOK_LEVERAGE as the dependent variable and find that the coefficient estimate of the interaction term is positive and statistically significant at the 1% level. This is consistent with Hypothesis 1. In column 2, we examine the potential mechanism through which creditor rights can affect debt and tax avoidance. If firms' reliance on debt reflects their trading off the marginal benefit of using debt tax shields with that of using non-debt tax shields, we expect a firm's interest payments to increase when creditor rights are stronger. Following the increase in creditor rights, firms take on more debt and, correspondingly, pay higher interest since the quantity of borrowed money has increased. We thus reestimate equation (2) but use interest payments over total

TABLE 3

Creditor Rights, Lending, and Tax Avoidance: Italian Setting

Table 3 examines the effect of creditor rights on lending and tax avoidance in Italy. The dependent variables are BOOK_LEVERAGE, TOTAL_INTERESTS, GAAP_ETR, and TAXES_PAID. The creditor rights indicator is CR. The variable HIGH_ENFORCEMENT denotes provinces whose number of bankruptcy proceedings days is below the median of the distribution of bankruptcy proceedings days across the 103 Italian provinces in 2003, and 0 otherwise. The model specifications include firm and region-year fixed effects. The table reports (in parentheses) heteroskedasticity-robust standard errors clustered at the appellate bankruptcy court level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels (2-tailed), respectively. Appendix A provides the variable definitions.

	$BOOK\_LEVERAGE_{t+1}$	$TOTAL\_INTERESTS_{t+1}$	$GAAP\_ETR_{t+1}$	$TAXES\_PAID_{t+1}$
	1	2	3	4
CR × HIGH_ENFORCEMENT	**0.0152*** (0.0032)**	**0.0005** (0.0002)**	**0.0129** (0.0055)**	**0.0018** (0.0008)**
FIRM_SIZE	0.0001 (0.0014)	0.0033*** (0.0002)	0.0051*** (0.0015)	−0.0453*** (0.0012)
INTANGIBLES	0.0192*** (0.0054)	0.0025*** (0.0006)	0.0162 (0.0139)	0.0047*** (0.0014)
INCOME	−0.0436*** (0.0035)	−0.0018*** (0.0002)	−0.4438*** (0.0189)	−0.0272*** (0.0016)
PPE	0.0130*** (0.0018)	0.0004*** (0.0001)	0.0685*** (0.0032)	0.0057*** (0.0009)
SALES_GROWTH	0.0056*** (0.0005)	−0.0001*** (0.0000)	−0.0214*** (0.0018)	0.0056*** (0.0002)
INVESTMENT	0.0069*** (0.0019)	0.0008*** (0.0001)	0.0076** (0.0036)	0.0001 (0.0007)
CASH	0.0014 (0.0010)	−0.0011*** (0.0001)	0.0828*** (0.0049)	0.0045*** (0.0006)
GDP per capita	−0.0082 (0.0062)	0.0002 (0.0004)	0.0088 (0.0060)	0.0012 (0.0024)
Firm fixed effects	Yes	Yes	Yes	Yes
Region-year fixed effects	Yes	Yes	Yes	Yes
No. of obs.	940,361	940,361	940,361	940,361
Adj. R^2	0.848	0.787	0.562	0.592
Within R^2	0.002	0.023	0.060	0.130

assets as the dependent variable. We find that the coefficient of interest (CR × HIGH_ENFORCEMENT) is positive and statistically significant at the 5% level. This result is consistent with the notion that stronger creditor rights induce firms to take on more debt and use debt tax shields in lieu of non-debt tax shields to reduce their tax burden. In line with this reasoning, in columns 3 and 4 of Table 3, we find that firms located in provinces with strong debt enforcement reduce corporate tax avoidance relative to firms in provinces with weak debt enforcement since their GAAP_ETR and taxes paid relative to total assets are significantly higher.[15]

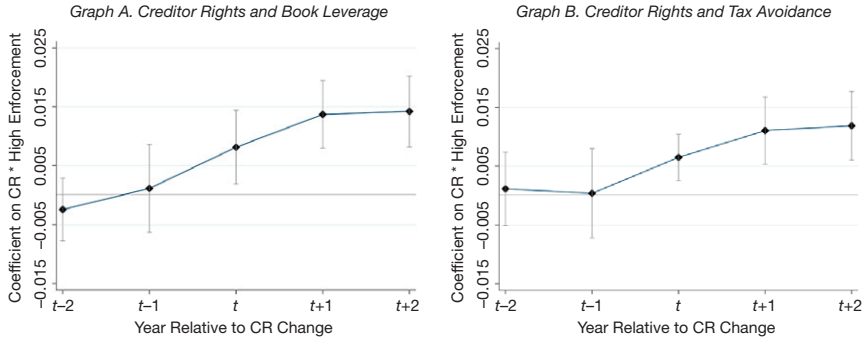
The causal interpretation of these results rests on the parallel trends assumption; that is, in the absence of changes in creditor protection, the average changes in debt and tax avoidance for the treatment and control firms will be similar. To assess the validity of the parallel trends assumption, we estimate equation (2) and include the 2-year leads and lags of CR. This test enables us to observe whether there is an anticipation of the change in creditor protection laws and whether firms delay their debt and tax avoidance responses. Figure 2 presents a direct visualization of this test. We plot the cumulative differences in debt (Graph A) and tax avoidance (Graph B) from $t-2$ to $t+2$ around the creditor protection reform year ($t=0$). We observe a parallel trend between the treated and control groups before the creditor protection change, rejecting the suggestion that firms anticipate creditor protection law changes. Collectively, the results in Table 3 and Figure 2 support our first hypothesis (i.e., the supply-side view) that stronger creditor rights increase firms' reliance on debt and reduce corporate tax avoidance.

Finally, we assess the economic significance of our results following the approach of Faccio and Xu (2015). Specifically, we use the ex-post observed

FIGURE 2

Cumulative Changes in Lending and Tax Avoidance: Italian Setting

Figure 2 plots the cumulative differences in the BOOK_LEVERAGE ratios (Graph A) and GAAP_ETR values (Graph B) of treated firms relative to counterfactual firms from year $t-2$ to year $t+2$. Treated firms are located in provinces whose number of bankruptcy proceedings days is below the median of the distribution of bankruptcy proceedings days across the 103 Italian provinces in 2003. Counterfactual firms are from provinces in the same region and year with bankruptcy proceedings days above the median of the distribution of bankruptcy proceedings days across the 103 Italian provinces in 2003. We estimate the cumulative treatment effects using the regression specified in equation (2). The connected line indicates the 95% confidence interval.



[15]Note that the *adjusted* R^2 is high in the analyses due to the fixed effects structure. Therefore, we also report the *within* R^2.

summary statistics to compute the elasticity of lending and tax avoidance to changes in creditor rights. We calculate the elasticity as follows: $(dy/dx) \times (x/y)$, where dy/dx consists of the coefficient estimates in columns 1 and 3 of Table 3 and (x/y) consists of the mean values of x (i.e., the creditor rights index) and y (i.e., BOOK_LEVERAGE or GAAP_ETR). We find that a 1% increase in the creditor rights indicator leads firms in provinces with strong debt enforcement to increase BOOK_LEVERAGE (GAAP_ETR) by 0.0846% (0.0811%) in our sample.[16] Importantly, the only variables that appear to be more important than creditor rights are GDP per capita, firm size, and profitability. We also obtain similar results when we use standard deviations $[(dy/dx) \times \text{STD}(x)]$ and interquartile ranges $[(dy/dx) \times \text{IQR}(x)]$ to measure the effect of a change in creditor rights on firms' leverage and tax avoidance. A 1-standard-deviation increase in creditor rights increases BOOK_LEVERAGE (GAAP_ETR) by 0.2282% (0.1931%) for firms located in provinces with strong debt enforcement. Moreover, an increase in creditor rights from the first to the third quartile increases BOOK_LEVERAGE (GAAP_ETR) by 0.46% (0.39%) for firms in provinces with strong debt enforcement. In sum, these results suggest that, in our sample, creditor rights are an economically important determinant of both capital structure and tax avoidance choices.

B. Robustness Tests

To test the robustness of our results, we perform a number of additional analyses. Specifically, as shown in row 1 of Table 4, we exclude firm-year observations during the 2007–2008 financial crisis to evaluate the possibility that the financial crisis might affect firms' financial policies. Similarly, as shown in row 2, we exclude firm-year observations from low economic growth areas (i.e., provinces with a negative GDP growth rate). Moreover, as shown in row 3, we include the interaction between geographic dummies (denoting the northeast, northwest, center, and south) and year dummies instead of region-year fixed effects. Note that our inclusion of the geographic dummies changes the identification strategy such that firms located in provinces with weak debt enforcement from the same region as well as from neighboring regions within the same geographic area serve as the control group for firms in provinces with strong debt enforcement. As shown in row 4, we cluster standard errors by appellate bankruptcy court and province rather than by appellate bankruptcy court only. We also verify the robustness of the results to clustering standard errors at the province level only (row 5) or the firm level only (row 6) and to 2-way clustering at the firm and province levels (row 7). Finally, in row 8 (row 9), we define the treatment and control group firms using the variable HIGH_ENFORCEMENT_1 (HIGH_ENFORCEMENT_2), which denotes provinces whose number of bankruptcy proceedings days is below the bottom tercile (mean) of the distribution of bankruptcy proceedings days across the 103 Italian provinces in 2003. Collectively, across all specifications, the results indicate that,

[16]Note that our fixed effects structure absorbs CR and HIGH_ENFORCEMENT, and we cannot estimate their elasticity. In untabulated analyses, we estimate equation (2) without fixed effects and find that the elasticity of CR is equal to 0.4835 (0.0602) in the leverage (GAAP_ETR) regression. Furthermore, we find that the elasticity of the interaction term is equal to 0.1118 (0.1456) in the leverage (GAAP_ETR) regression.

TABLE 4

Creditor Rights, Lending, and Tax Avoidance: Robustness Tests, Italian Setting

Table 4 examines the robustness of the main results to several changes to the baseline specifications of columns 1 and 3 of Table 3. The dependent variables are BOOK_LEVERAGE and GAAP_ETR. In row 1, we exclude firm-year observations during the 2007–2008 financial crisis. In row 2, we exclude firm-year observations from low-economic growth areas. We define low-economic growth areas as those provinces whose GDP growth rate is lower than 0. In row 3, we include the interaction between geographic dummies (denoting the northeast, northwest, center, and south) and year dummies, instead of region-year fixed effects. In row 4, we adjust the standard errors for 2-way clustering at the appellate bankruptcy court and province levels. In row 5, we adjust the standard errors for clustering at the province level. In row 6, we adjust the standard errors for clustering at the firm level. In row 7, we adjust the standard errors for 2-way clustering at the firm and province levels. In row 8, we define the treatment and control group firms using the variable HIGH_ENFORCEMENT_1, which denotes provinces whose number of bankruptcy proceedings days is below the bottom tercile of the distribution of bankruptcy proceedings days across the 103 Italian provinces in 2003, and 0 otherwise. In row 9, we define the treatment and control group firms using the variable HIGH_ENFORCEMENT_2, which denotes provinces whose number of bankruptcy proceedings days is below the mean of the distribution of bankruptcy proceedings days across the 103 Italian provinces in 2003, and 0 otherwise. Each regression includes all the controls of columns 1 and 3 of Table 3 (coefficients unreported) as well as firm and region-year fixed effects (with the exception of row 3). Unless differently specified (from rows 4 to 7), the table reports (in parentheses) heteroskedasticity-robust standard errors clustered at the appellate bankruptcy court level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels (2-tailed), respectively. Appendix A provides the variable definitions.

	$BOOK\_LEVERAGE_{t+1}$	$GAAP\_ETR_{t+1}$
	1	2
1) Exclude financial crisis	0.0150***	0.0140**
	(0.0033)	(0.0063)
2) Exclude low-economic growth areas	0.0103*	0.0171*
	(0.0060)	(0.0096)
3) Control for economic region-year fixed effects	0.0144***	0.0112*
	(0.0025)	(0.0059)
4) Cluster standard errors by bankruptcy court and province	0.0152***	0.0129**
	(0.0032)	(0.0055)
5) Cluster standard errors by province	0.0152***	0.0129**
	(0.0035)	(0.0055)
6) Cluster standard errors by firm	0.0152***	0.0129***
	(0.0025)	(0.0042)
7) Cluster standard errors by firm and province	0.0152***	0.0129***
	(0.0025)	(0.0042)
8) Alternative HIGH_ENFORCEMENT_1	0.0136***	0.0123**
	(0.0040)	(0.0059)
9) Alternative HIGH_ENFORCEMENT_2	0.0199***	0.0136*
	(0.0041)	(0.0082)

for firms located in provinces with strong debt enforcement, an increase in the creditor rights index leads to higher debt ratios and ETR values relative to control group firms from the same region (or the same geographic area) but located in provinces with weak debt enforcement.

Furthermore, to corroborate the evidence that firms trade off debt and non-debt tax shields to reduce the tax burden, in Supplementary Material Table A3 we also examine the joint change in book leverage and tax avoidance when creditor rights change in a simultaneous system of equations using 2-stage least squares. In this analysis, not only should leverage motivate firms to reduce tax avoidance, but also lower tax avoidance could be associated with higher debt financing when creditor rights become stronger.[17] Consistent with the main findings, we continue to find

[17]In 2-stage least squares estimation, each equation in the system should have at least one independent variable that is not associated with the other dependent variables. Similar to Coles, Daniel, and Naveen (2006) and Rego and Wilson (2012), in our research setting, it is difficult to identify firm characteristics that are significantly associated with leverage but not with tax avoidance, and vice versa. Nonetheless, we exclude Altman's *Z*-score from the leverage equation since this variable exhibits little correlation with leverage (0.0125), but we include it in the ETR equation since financially constrained

that firms in provinces with strong debt enforcement increase (reduce) leverage (tax avoidance) when creditor rights become stronger.

Finally, to strengthen the interpretation of our findings (that stronger creditor rights reduce tax avoidance), in Supplementary Material Table A4, we complement our firm-level evidence with an aggregate analysis. The setting is from the Italian Ministry of Economy and Finance and comprises the corporate tax returns of all incorporated firms in Italy aggregated at the regional-year level. Since all firms in our Amadeus sample are mandated to file tax returns, these firms should also be included in the aggregated tax returns data. Therefore, the advantage of this setting is that we can reliably estimate the impact of creditor rights on aggregate tax avoidance since we know the exact amount of taxes paid by all firms in each region–year, as well as the aggregate taxable income. However, the disadvantage of these data is that we do not have access to the tax information of single firms. In line with our previous findings, we find that aggregate tax avoidance decreases with stronger creditor rights. Interestingly, we find that the economic magnitude of the results is very similar to that of the main findings in Table 3, suggesting that the level of aggregation does not affect our main inferences.

V. External Validity: Creditor Rights, Lending, and Tax Avoidance Around the World

While the Italian setting allows us to draw causal inferences about the effect of creditor rights on debt and tax avoidance, relying solely on a single-country study has its limitations. Our second set of analyses extends the sample to an international setting, using information from 33 countries, to ensure that our results so far are not unique to the creditor rights reforms in Italy. Moving to an international sample comes at the cost of less explicit causal relations between creditor rights, debt financing, and tax avoidance. However, the results from our international sample are valuable in assessing how creditor rights relate to debt and tax avoidance when considered in combination with the causal results in the Italian setting. Moreover, these results enable us to exploit important tax system characteristics and their interactions with creditor protection laws.

A. Creditor Rights Around the World

We use the World Bank's legal rights index, which captures the extent to which the bankruptcy code protects creditors in a given country k in year t. Since the World Bank's legal rights index ranges between 0 and 10, we normalize it to the range of 0–4 to be consistent with the Italian setting. Based on this method, we produce a continuous creditor rights index (CR) over the period of 2004 to 2013 ranging from 0 to 4, with higher scores indicating stronger creditor rights.[18] Table 5 summarizes

firms could have an incentive to increase tax avoidance to generate internal resources (Edwards, Schwab, and Shevlin (2016)). Additionally, we exclude intangibles and investment from the ETR equation since our sample mostly comprises private firms that likely rely less on intangibles or invest less in foreign subsidiaries to avoid taxes.

[18]Our sample starts in 2004 and ends in 2013 for the following reasons. First, the World Bank's legal rights index was not available before 2004. Second, the methodology used by the World Bank to

TABLE 5

Sample Composition and Country-Specific Statistics

Table 5 provides an overview of the 33 sample countries along with the strength of creditor rights and the major creditor rights reforms over 2004–2013. Appendix B provides the variable definitions.

Country	Creditor Rights	Major Reform	Country	Creditor Rights	Major Reform	Country	Creditor Rights	Major Reform
Argentina	1.95		Germany	3.01	2012	Philippines	1.53	
Australia	3.53		Greece	1.54		Poland	3.22	
Austria	2.46		Hong Kong	4.00		Portugal	1.18	
Belgium	2.00		Italy	1.29	2005	Singapore	3.92	
Brazil	1.19	2005	Japan	2.60		Spain	2.37	2004
Canada	2.61		Korea	2.45		Sweden	2.69	
Chile	1.72		Malaysia	3.87		Switzerland	2.92	
China	1.76		Mexico	1.76		Thailand	2.00	
Denmark	3.38		Netherlands	2.15		Turkey	1.63	
Finland	2.95		Norway	2.36		United Kingdom	4.00	
France	1.58	2005	Peru	2.03		United States	3.28	2005

the sample countries and the average creditor rights index for each country over the period of 2004 to 2013. The creditor rights index ranges from an average of 4 in Hong Kong and the United Kingdom to less than 1.2 in Brazil and Portugal, with an average across all countries of 2.75. The variation in creditor rights is large both across and within the countries, with a cross-country standard deviation of 0.88 and a maximum (minimum) within-country standard deviation of 1.03 (0) in Peru (Belgium, Hong Kong, Thailand, and the United Kingdom). This result suggests meaningful variation across and within countries for gauging the effects of creditor rights on lending and tax avoidance.

Aggregate evidence is shown in Graph A of Figure 3, which plots the relation between the average private credit (scaled by GDP) for each of the 33 countries over the 2004–2013 period and the average creditor rights index.[19] We find a strong positive correlation between these two variables. On the one hand, private credit is high in countries with an English legal origin, such as Hong Kong and the United Kingdom, where the CR score is high. On the other hand, private credit is low in countries with a French legal origin, such as Brazil, France, Mexico, and the Philippines, where the CR score is low.[20] The cross-country explanatory power of creditor rights for private credit is high. The R^2 value of this simple regression is 0.24.

In Graph B of Figure 3, we repeat the same exercise by plotting the corporate tax revenues scaled by GDP for each of the 33 countries over the 2004–2013 period.[21]

compute the creditor rights index changed in 2014. This could bias our analyses (see also the World Bank's Doing Business database for more details, available at https://www.doingbusiness.org/en/data, last accessed Sept. 18, 2021). Third, we want to be consistent with the Italian setting and focus on a similar time period.

[19]The data on private credit (as a percentage of GDP) are from the World Bank's IBRRD-IDA database (available at https://data.worldbank.org/indicator/FS.AST.PRVT.GD.ZS, last accessed Oct. 15, 2021).

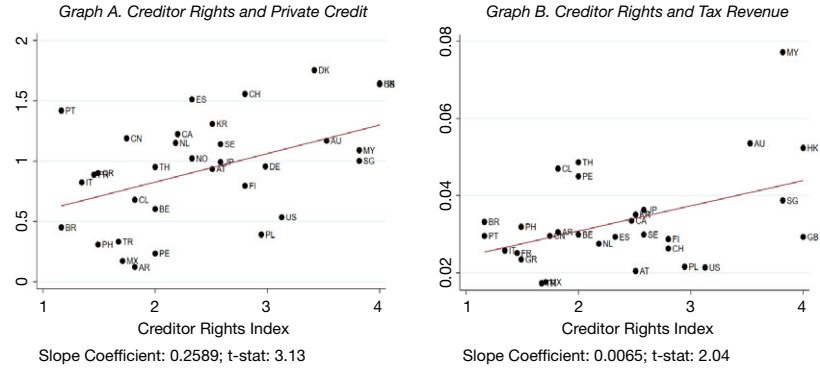
[20]In line with our observation, Davidenko and Franks (2008) examine how various degrees of creditors' rights across France, Germany, and the United Kingdom affect lending and reorganization practices. They find that France has the least protection for creditors, and loan contracts require more collateral in countries with a French legal origin.

[21]The data on corporate tax revenues (as a percentage of GDP) are from the OECD's corporate tax statistics database (available at https://stats.oecd.org/Index.aspx?DataSetCode=CTS_REV, last accessed Oct. 15, 2021).

FIGURE 3

Creditor Rights, Private Credit, and Corporate Tax Revenue Around the World

Figure 3 depicts the relations between the strength of creditor rights and total private credit (Graph A) and corporate tax revenue (Graph B), both expressed as a percentage of the GDP, for the 33 sample countries from 2004 to 2013.



Similar to the previous analysis, this graph shows a positive correlation between the two variables, with countries with an English (French) legal origin having the highest (lowest) amounts of corporate tax revenues, suggesting higher (lower) tax collection. These simple cross-country correlations are not evidence of a causal relation and can reflect other relevant differences across countries. Nonetheless, these associations are consistent with our previous findings that stronger creditor rights seem to incentivize firms to substitute away from tax avoidance toward debt financing.

The main concern in our cross-country analysis is that the strength of creditor rights is not exogenously determined but related to changes in economic conditions. In Supplementary Material Table A5, we examine the determinants of CR by estimating panel regression models. Specifically, we examine whether country-level economic or political variables predict the likelihood of passing creditor protection laws. These variables are measured up to 3 years prior to the actual change in CR. We include country and year-fixed effects in all the regressions. Of the large set of political and economic variables, none seems to covary with CR changes. While we cannot fully rule out the endogeneity of CR, these results reassure us that our main creditor rights index does not systematically vary with macroeconomic trends.

B. Estimation Strategy, Data, and Summary Statistics

We now turn to the cross-country analysis to provide external validity to our previous findings. We estimate the relations between creditor rights, debt, and tax avoidance at the firm level using the following equation:

$$y_{i,k,t+1} = \alpha_0 + \beta_1 \mathrm{CR}_{k,t} + \beta_2 X_{i,t} + \beta_3 \Pi_{k,t} + \upsilon_i + \varphi_m \times \omega_t + \varepsilon_{i,t}, \quad (3)$$

where $y_{i,k,t+1}$ is, alternatively, BOOK_LEVERAGE or GAAP_ETR for firm i in country k and year $t+1$. We compute BOOK_LEVERAGE as total debt relative to

total assets. Similar to the previous analyses, we define GAAP_ETR as income taxes divided by pretax income and winsorize it at 0 and 1.[22] For our analyses, we use consolidated balance sheets for 12,052 listed nonfinancial and nonutility firms located in 33 countries from Compustat Global and Compustat North America.

The main variable of interest is CR, which is a continuous creditor rights index ranging from 0 to 4, as defined in Section V.A.[23] In line with the supply-side view hypothesis, we expect $\beta_1 > 0$. We control for the standard determinants of leverage and tax avoidance ($X_{i,t}$) typically used in the capital structure and tax avoidance literature (e.g., Graham (2003), Rego (2003), Armstrong, Blouin, and Larcker (2012), and Faccio and Xu (2015)). Specifically, we control for size, market to book, intangibles, research and development, income, PPE, cash, accruals, payout, the *Z*-score, investment, and sales growth. We also add several country-level determinants of creditor rights ($\prod_{k,t}$) to ensure that observable legal and economic conditions are not spuriously driving the results (e.g., La Porta et al. (1997), (1998), Djankov et al. (2007)).[24] To avoid the impact of exchange rate fluctuations biasing the results, we convert each firm-level variable of all the sample countries into real U.S. dollars using the World Bank Currencies database. We winsorize all the nonindicator variables, except country-level variables, at the 1st and 99th percentiles. All the variables are defined in Appendix B. We also include firm fixed effects (υ_i) and industry–year fixed effects defined at the 2-digit SIC code level ($\varphi_m \times \omega_t$). Firm fixed effects control for time-invariant firm characteristics. Industry–year fixed effects absorb time-varying industry shocks that could affect firms' debt financing and tax avoidance.[25] Finally, we follow Daske, Hail, Leuz, and Verdi (2008) and

[22]Note that our results are robust to the use of alternative measures of debt and tax avoidance (see Panel A of Supplementary Material Table A6).

[23]As Bae and Goyal ((2009), p. 823) note, "The *local* legal tradition and the enforceability of contracts is what matters in loan contracting… Most borrowers file for bankruptcy in their home country." Anecdotal evidence also suggests that borrowers file for bankruptcy in the country where they are headquartered. For example, the SEC's filings on the Parmalat bankruptcy case state that "Parmalat Finanziaria, whose stock traded on the Milan Stock Exchange until December 2003, is based in Parma, Italy. Its main operating subsidiary, Parmalat S.p.A., sells dairy products throughout the world. Parmalat S.p.A. is consolidated into the financial statements of Parmalat Finanziaria… Until the revelations beginning in December 2003, Parmalat Finanziaria employed 36,000 people and had operations in thirty (30) countries, including the United States. On December 24, 2003, following the disclosure of some of the facts alleged in this litigation, Parmalat Finanziaria filed for bankruptcy protection in Parma, Italy" (available at https://www.sec.gov/litigation/complaints/comp18803.pdf, last accessed Oct. 5, 2021). Therefore, consistent with previous studies and anecdotal evidence, in our analyses, we use the creditor rights index of the headquarters country.

[24]In particular, we control for the variable *Rule of law* as a measure of a country's general enforcement. We include an index capturing the protection of minority shareholders, and we add standard macroeconomic controls correlated with a country's level of financial development (i.e., GDP per capita and the inflation rate). We evaluate the joint effect of corporate and personal taxes on leverage and tax avoidance by adding the Miller tax index, which is not subject to the concern that multiple types of taxes could be highly correlated with each other. However, in untabulated tests, we also find that our results are robust to the inclusion of each tax rate separately.

[25]In robustness tests, we also add country-specific time trends and allow countries to follow different trends in tax avoidance and absorb any variability due to the passage of time, which could be a concern given the well-known trend in tax avoidance over the past decades (Dyreng, Hanlon, Maydew, and Thornock (2017)). Columns 1 and 2 in Panel B of Supplementary Material Table A6 show that our results are robust to the inclusion of such trend variables.

TABLE 6

Summary Statistics: Cross-Country Setting

Table 6 reports summary statistics for the main variables in the regression models. The sample comprises 65,187 firm-year observations of industrial firms (excluding financial firms and utilities) from Compustat North America and Compustat Global from 2004 to 2013. All non-indicator variables, except for province-level variables, are winsorized at the first and 99th percentiles. Appendix B provides the variable definitions.

Variables	No.	Mean	Std. Dev.	25th Percentile	Median	75th Percentile
Dependent variables						
BOOK_LEVERAGE	65,187	0.1858	0.1714	0.0365	0.1608	0.2908
TOTAL_INTERESTS	65,187	0.0094	0.0128	0.0014	0.0058	0.0135
GAAP_ETR	65,187	0.2913	0.1811	0.1725	0.2888	0.3827
TAXES_PAID	65,187	0.0205	0.0265	0.0018	0.0142	0.0297
NO_OF_TAX_HAVENS	35,124	0.2230	0.5512	0.0000	0.0000	0.0000
TAX_HAVEN_USE	35,124	0.1868	0.3897	0.0000	0.0000	0.0000
Creditor rights indicators						
CR	65,187	2.7494	0.8807	2.0000	2.8000	3.6000
BANKRUPTCY_ENFORCEMENT	65,187	0.4848	0.5005	0.0000	0.0000	1.0000
CR (major reforms)	84,700	0.1450	0.4084	0.0000	0.0000	0.0000
Firm-level variables						
FIRM_SIZE	65,187	6.0326	1.7589	4.8625	5.8700	7.0874
MARKET-TO-BOOK	65,187	2.3837	3.1073	0.9451	1.6582	2.8843
INTANGIBLES	65,187	0.0957	0.1550	0.0029	0.0183	0.1190
R&D	65,187	0.0167	0.0456	0.0000	0.0000	0.0108
INCOME	65,187	0.1443	0.1008	0.0778	0.1228	0.1841
PPE	65,187	0.6132	0.4328	0.2805	0.5363	0.8593
CASH	65,187	0.2125	0.2691	0.0641	0.1400	0.2692
ACCRUALS	65,187	−0.0005	0.1556	−0.0598	0.0017	0.0619
PAYOUT	65,187	0.6906	0.4622	0.0000	1.0000	1.0000
Z_SCORE	65,187	1.8376	1.8139	1.2692	1.8365	2.4665
INVESTMENT	65,187	0.0634	0.0846	0.0178	0.0383	0.0752
SALES GROWTH	65,187	0.1343	0.3409	0.0188	0.1090	0.2207
Country-level variables						
RULE_OF_LAW	65,187	1.0776	0.8110	0.8809	1.3634	1.6279
SHAREHOLDER_RIGHTS	65,187	6.7972	0.6821	6.6600	7.0000	7.2500
GDP per capita	65,187	10.1786	0.9810	9.9226	10.7034	10.7882
MILLER_TAX_INDEX	65,187	0.0329	0.1364	−0.0676	0.0000	0.2036
INFLATION	65,187	0.0201	0.0182	0.0025	0.0208	0.0323

cluster standard errors at the country–industry level to avoid small cluster bias from a limited number of countries.[26]

Table 6 provides descriptive statistics. The average GAAP_ETR value is 29.13%, whereas the BOOK_LEVERAGE value is around 18.58% of the total assets. Moreover, the average creditor rights index across countries over the sample period is equal to 2.75. On average, firms hold 21% as cash and short-term equivalents and 61% of the previous year's total assets in PPE, and they have a return on assets (INCOME) of around 14%.

C. Baseline Results

The baseline results from estimating equation (3) are presented in Table 7. In column 1, we find that an increase in the creditor rights index results in an increase

[26]In columns 3 and 4 in Panel B of Supplementary Material Table A6, we further test the robustness of the results to clustering standard errors on two dimensions: at the country-year level, to allow observations for a given country and creditor rights change to be correlated; and at the firm level, to allow for time-series correlation (Petersen (2009), Faccio and Xu (2015)). In untabulated tests, we also follow Bertrand and Mullainathan (2003) and Bertrand, Duflo, and Mullainathan (2004) and rerun equation (3) while employing the most conservative clustering method (i.e., at the country level). Across all the specifications, the creditor rights indicator is still positive and statistically different from 0 at conventional levels, suggesting that the main findings are not sensitive to the clustering method.

TABLE 7

Creditor Rights and Lending: Cross-Country Setting

Table 7 examines the effect of creditor rights on lending across countries. The dependent variables are BOOK_LEVERAGE and TOTAL_INTERESTS. The creditor rights indicators are CR and CR (major reforms). The variable BANKRUPTCY_ENFORCEMENT denotes countries whose number of bankruptcy proceedings years is below the median of the distribution of bankruptcy proceedings years across the 33 sample countries in 2004, and 0 otherwise. The model specifications include firm and industry–year fixed effects. The table reports (in parentheses) heteroskedasticity-robust standard errors clustered at the country-industry level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels (2-tailed), respectively. Appendix B provides the variable definitions. The level of significance is indicated by the asteriks.

	$BOOK\_LEVERAGE_{t+1}$			$TOTAL\_INTERESTS_{t+1}$		
	1	2	3	4	5	6
CR	0.0034***	0.0030**		0.0009***	0.0008***	
	(0.0013)	(0.0012)		(0.0002)	(0.0002)	
CR × BANKRUPTCY_ENFORCEMENT		0.0054**			0.0008***	
		(0.0026)			(0.0002)	
CR (major reforms)			0.0074**			0.0009***
			(0.0033)			(0.0003)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry–year FE	Yes	Yes	Yes	Yes	Yes	Yes
No of obs.	65,187	65,187	84,700	65,187	65,187	84,700
Adj. R^2	0.813	0.813	0.753	0.681	0.682	0.656
Within R^2	0.049	0.049	0.051	0.041	0.041	0.044

in BOOK_LEVERAGE. This effect is significantly higher for firms in countries with stronger debt enforcement (column 2), implying that a predefined level of enforcement reinforces the positive effect of creditor protection laws on borrowers' debt financing.[27] Therefore, the ability to enforce debt contracts appears to be as important as the legal rights to the debt contracting process. As shown in column 3 of Table 7, we test the robustness of these findings to using an alternative creditor rights indicator. We focus on six major reforms that substantially changed (or entirely replaced, as in the case of Italy) the bankruptcy codes of their own countries. Three countries (Spain in 2004, the United States in 2005, and Germany in 2012) increased creditor protection over the sample period, whereas 3 countries (Brazil in 2005, Italy in 2005, and France in 2005) reduced it.[28] We then follow the methodology of Simintzi, Vig, and Volpin (2015) and Dessaint, Golubov, and Volpin (2017) and compute an overall creditor rights indicator that captures variation in creditor rights within a country over time. We specify the treatment indicator (CR_MAJOR_REFORMS) recursively starting 1 year before the sample period ($CR\_MAJOR\_REFORMS^{2000} = 0$). For any given country k in year t, CR_MAJOR_REFORMS take the value of 1 (if creditor rights became stronger) or −1 (if creditor rights became weaker), and 0 otherwise. In subsequent years, we assign the previous year's value if a country did not experience any bankruptcy reform in that year. Following this approach, we obtain a discrete creditor rights indicator over the period of 2001 to 2013 ranging between −1 and 1, with higher scores indicating stronger creditor rights.[29] We find that the coefficient of

[27]We define strong (weak) debt enforcement countries at the beginning of the sample period in 2004.

[28]Supplementary Material Section 4 provides a detailed description of each reform.

[29]The sample starts in 2001 to allow firms sufficient time to respond to major creditor rights changes. Note, however, that the results are qualitatively unchanged if we start the analyses in 2004.

CR_MAJOR_REFORMS is positive and statistically significant at the 5% level, suggesting that a firm's debt ratio increases when creditor rights become stronger. Collectively, the results across all specifications are consistent with stronger creditor rights increasing debt financing.[30]

Motivated by the robust evidence that stronger creditor rights increase debt financing, we then provide evidence of the mechanism driving the debt and tax avoidance responses. Similar to the Italian setting, if firms substitute away from tax avoidance toward debt financing to take advantage of debt tax shields when creditor rights become stronger, we expect a firm's interest payments to increase. Columns 4–6 of Table 7 present the results. As expected, we find that interest payments increase when creditor rights are stronger, confirming our findings from the Italian setting and the economic channel through which stronger creditor rights impact debt financing and tax avoidance (i.e., trade-off between debt and non-debt tax shields).

Next, we estimate equation (3) with tax avoidance proxies to analyze whether firms reduce tax avoidance in response to stronger creditor rights. Table 8 presents the results. In column 1, we find that an increase in the creditor rights index increases GAAP_ETR. This effect is significantly greater for firms in countries with stronger debt enforcement (column 2), and it is robust to an alternative

TABLE 8

Creditor Rights and Tax Avoidance: Cross-Country Setting

Table 8 examines the effect of creditor rights on tax avoidance across countries. The dependent variables are GAAP_ETR, TAXES_PAID, NO_OF_TAX_HAVENS, and TAX_HAVEN_USE. The creditor rights indicators are CR and CR (major reforms). The variable BANKRUPTCY_ENFORCEMENT denotes countries whose number of bankruptcy proceedings years is below the median of the distribution of bankruptcy proceedings years across the 33 sample countries in 2004, and 0 otherwise. The model specifications include firm and industry-year fixed effects. The table reports (in parentheses) heteroskedasticity-robust standard errors clustered at the country-industry level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels (2-tailed), respectively. Appendix B provides the variable definitions. The level of significance is indicated by the asteriks.

	$GAAP\_ETR_{t+1}$			$TAXES\_PAID_{t+1}$	NO_OF_TAX_HAVENS$_{t+1}$	TAX_HAVEN_USE$_{t+1}$
	(1)	(2)	(3)	(4)	(5)	(6)
CR	0.0107***	0.0082***		0.0011***	−0.0101**	−0.0045**
	(0.0027)	(0.0026)		(0.0004)	(0.0040)	(0.0021)
CR × BANKRUPTCY_ENFORCEMENT		0.0294***				
		(0.0060)				
CR (major reforms)			0.0170***			
			(0.0055)			
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry-year FE	Yes	Yes	Yes	Yes	Yes	Yes
No of obs.	65,187	65,187	84,700	65,187	35,124	35,124
Adj. R^2	0.286	0.286	0.267	0.630	0.926	0.941
Within R^2	0.007	0.007	0.005	0.071	0.010	0.006

[30]In untabulated robustness tests, we estimate equation (3) for the United Kingdom and the United States alone, which are similar in culture, institutions, and financial development but differ with respect to the protection granted to creditors. We find that the results remain significant, and the creditor rights effects are of almost equal magnitude. Furthermore, we simulate the data so that the indicator CR is randomly assigned to a firm. We repeat the procedure 1,000 times and find that the average estimates are 0 and statistically nonsignificant. Furthermore, in Supplementary Material Figure A4, we run regression (3) but exclude one country at a time. We find that all the results remain significant, and the creditor rights effects are of almost equal magnitude.

creditor rights indicator (column 3) and to an alternative measure of tax avoidance (column 4). Furthermore, to provide direct evidence of the reduction in tax avoidance, we examine changes in specific tax avoidance strategies when creditor rights become stronger. One strategy used by multinational companies to reduce the tax burden is to shift profits to low-tax jurisdictions, particularly to tax haven countries (Dyreng and Lindsey (2009), Dharmapala (2020)). We predict that if firms reduce tax avoidance in response to stronger creditor rights, tax haven operations will become less important in a firm's tax strategy. To test this prediction, for each sample firm and year we obtain the number of majority-owned subsidiaries located in tax haven countries from Bureau van Dijk's Orbis database over the period of 2004 to 2013.[31] We then compute the natural logarithm of the number of tax haven subsidiaries (NO_OF_TAX_HAVENS).[32] We also create an indicator variable taking the value of 1 if a firm reports tax haven operations in a year, and 0 otherwise (TAX_ HAVEN_USE). We reestimate equation (3) using these two dependent variables. Columns 5 and 6 of Table 8 present the results. Consistent with firms reducing tax avoidance, the number (and the use) of tax haven subsidiaries decreases when creditor rights are stronger.

Similar to the previous analyses, we also examine the dynamics of book leverage and tax avoidance around the changes in creditor rights by estimating equation (3) while including the 2-year lead and lag of the creditor rights indicator. Figure 4 presents a direct visualization of the lead–lag relation. We plot the cumulative differences in BOOK_LEVERAGE and GAAP_ETR from $t-2$ to $t+2$ around the change in creditor rights ($t=0$). There is a clear parallel trend between the treated and control groups before the change in creditor rights, supporting our identification assumption. At t, the treated firms increase their book leverage and ETR substantially relative to the control firms. More importantly, we observe that these gaps are not reversed in the following years. The cumulative book leverage and ETR differences remain large and statistically significant at $t+1$ and $t+2$. This observation emphasizes the long-term importance of creditor rights effects since it appears that treated firms do not reverse their capital structure or tax avoidance strategies.

Finally, we assess the economic significance of creditor rights on lending and tax avoidance in our cross-country sample following Faccio and Xu (2015) and using ex-post observed summary statistics. We compute the elasticity based on the coefficient estimates in column 2 of Tables 7 and 8. According to our estimates, creditor rights appear to be an economically relevant determinant for firms' lending

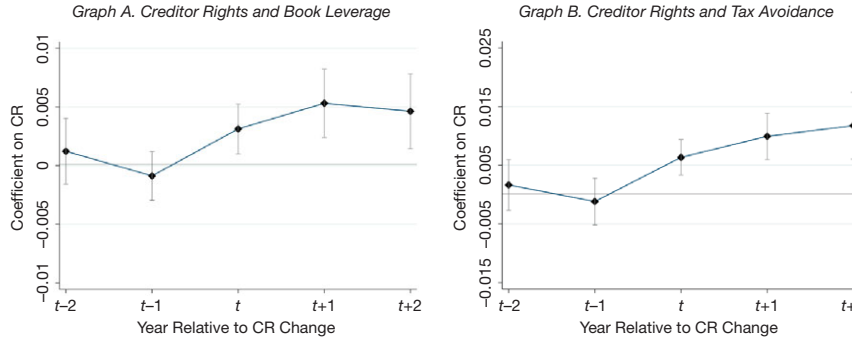
[31]We focus on majority-owned subsidiaries to ensure that the parent firm has sufficient voting rights to control the subsidiary and to consolidate it. To merge the data from the Orbis database with the data from Compustat Global and Compustat North America, we use the ISIN (CIK) code for firms headquartered outside (in) the United States. This process allows us to merge 6,572 of 12,052 firms in our sample, amounting to 35,124 firm-year observations over the period 2004–2013. To define whether a foreign subsidiary is located in a tax haven country, we follow the OECD tax haven list (available at http://www.oecd.org/tax/transparency, last accessed Sept. 16, 2021).

[32]Consistent with Dharmapala (2020), we find that the distribution of tax haven subsidiaries is highly skewed, with most firms reporting 0 tax haven subsidiaries. We therefore, add a constant equal to one before taking the logarithm.

FIGURE 4

Cumulative Changes in Lending and Tax Avoidance: Cross-Country Setting

Figure 4 plots the cumulative differences in the BOOK_LEVERAGE ratios (Graph A) and GAAP_ETR values (Graph B) of treated firms relative to counterfactual firms from year $t-2$ to year $t+2$. Treated firms are located in countries with a change in creditor rights in year t_0 across the 33 countries between 2004 and 2013. Counterfactual firms are from countries in the same industry and year. We estimate the cumulative treatment effects using the regression specified in equation (3). The connected line indicates the 95% confidence interval.



and tax avoidance choices, especially when considered in combination with strong debt enforcement. A 1% increase in the creditor rights indicator combined with strong debt enforcement leads to a 0.12% (0.35%) increase in BOOK_LEVERAGE (GAAP_ETR) in our sample. Importantly, with the exception of firm size and GDP per capita, we find that the elasticities of book leverage and ETR to changes in the other control variables are generally much smaller. Using standard deviations, we find that book leverage increases by 0.26%, or by 0.74% in conjunction with strong debt enforcement, for a 1-standard-deviation increase in creditor rights. Furthermore, a 1-standard-deviation increase in creditor rights increases ETR by 0.72%, or by 3.31% in conjunction with strong debt enforcement. Finally, we find that an increase in creditor rights from the first to the third quartile increases leverage (ETR) by 0.48% (1.31%), or by 1.35% (6.01%) when combined with strong debt enforcement. Collectively, while the effect of creditor rights on leverage appears as economically significant as other standard determinants (e.g., firm size and GDP per capita), the effect of creditor rights on tax avoidance seems to be even more economically important than the traditional firm-level determinants in our sample.

D. Heterogeneity in Lending and Tax Avoidance Effects: The Role of Tax System Characteristics

Next, we exploit heterogeneity in creditor rights responsiveness across firms. This analysis has two key benefits. First, it allows us to provide evidence of the underlying trade-off between debt and non-debt tax shields, with alternative proxies for the marginal costs and benefits of tax avoidance. Second, it allows us to shed light on the interaction between creditor rights laws and tax system characteristics. In this regard, we show that the decision of whether to substitute tax avoidance with debt is likely the result of the incentives provided by both sets of rules (i.e., creditor protection laws and tax laws). While creditor protection laws encourage lenders to

extend credit and firms to use debt tax shields, provisions in a country's tax code can reduce the value of debt tax shields as substitutes of non-debt tax shields.[33]

We operationalize the notion that firms could find it less beneficial to substitute non-debt tax shields with debt tax shields in three ways. First, firms located in countries with higher deductibility of financing costs will have fewer incentives to substitute non-debt tax shields with debt tax shields when creditor protection becomes stronger. To measure the deductibility of financing costs, we collect data on several tax base items from the KPMG and E&Y corporate tax guides, as well as from Bethmann, Jacob, and Müller (2018) and Alexander, De Vito, and Jacob (2020). We examine a joint measure of several rules instead of selected rules in isolation, as tax base elements jointly shape the overall level of deductibility. Specifically, we collect information on allowances for corporate equity, thin capitalization rules, and loss carryback and loss carryforward rules. We include allowances for corporate equity to proxy for the tax deductibility of equity financing (Auerbach, Devereux, and Simpson (2008)). Closely related, we also collect information on thin capitalization rules to account for the limited deductibility of interest payments on internal debt financing.[34] Finally, to account for the asymmetric tax treatment of income and losses, we use the information on loss carryback and loss carryforward rules from Bethmann et al. (2018) and add the missing data for our sample countries. A more symmetric taxation of profits and losses increases the present value of tax refunds and makes debt tax shields less valuable (e.g., Auerbach (1986), Altshuler and Auerbach (1990), MacKie-Mason (1990), and Dhaliwal, Trezevant, and Wang (1992)).[35]

Since all these base items relate to the deductibility of financing costs, we combine all the tax base items into an overall index (DEDUCTIBILITY) that measures the extent to which financing costs are tax-deductible in a given country k in year t. The index theoretically ranges from 0 (low deductibility) to 2 (high deductibility, with allowances for corporate equity, no thin capitalization rules, loss carryback, and rules on loss carryforward from a minimum of 6 years, with no maximum).[36] We then augment equation (3) with both the DEDUCTIBILITY proxy and its interaction with CR. Columns 1 and 2 of Table 9 present the coefficient estimates of the main variables of interest. In both columns, we find that the CR coefficient is positive and statistically significant at the 1% level. This result

[33]In our empirical tests, we use country-level proxies for the trade-off between debt and non-debt tax shields since firm-specific tax avoidance outcome measures – such as GAAP_ETR – face the issue of the simultaneous determination of capital structure and tax avoidance responses.

[34]Buettner, Overesch, Schreiber, and Wamser (2012) show that thin capitalization rules reduce the incentive to use internal debt among affiliates for tax avoidance purposes but result in higher levels of external debt.

[35]This phenomenon is known as tax exhaustion. The idea is that firms with substantial non-debt tax shields are less likely to finance with leverage. In line with this reasoning, Trezevant (1992) finds that tax-exhausted firms reduced debt usage the most following the 1981 liberalization of tax laws that increased non-debt tax shields.

[36]Supplementary Material Table A7 lists our sample countries and their tax base items. All the countries except Austria, Belgium, and Italy did not have an allowance for corporate equity. Most countries restricted interest deductibility on internal debt by enacting thin capitalization rules. Finally, all the countries allowed firms to carry forward tax losses, but less than half had loss carryback provisions in place.

TABLE 9

Role of the Tax System in Creditor Rights, Lending, and Tax Avoidance: Cross-Country Setting

Table 9 examines the effect of creditor rights on lending and tax avoidance, conditional on tax system characteristics. The dependent variables are BOOK_LEVERAGE and GAAP_ETR. The creditor rights indicator is CR. The model specifications include firm and industry–year fixed effects. The table reports (in parentheses) heteroskedasticity-robust standard errors clustered at the country-industry level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels (2-tailed), respectively. Appendix B provides the variable definitions.

		DEDUCTIBILITY		LOW_TAX_ENFORCEMENT		LOW_TAX_RATE	
	Exp. Sign	BOOK_LEVERAGE$_{t+1}$	GAAP_ETR$_{t+1}$	BOOK_LEVERAGE$_{t+1}$	GAAP_ETR$_{t+1}$	BOOK_LEVERAGE$_{t+1}$	GAAP_ETR$_{t+1}$
		1	2	3	4	5	6
CR	+	0.0060***	0.0164***	0.0048***	0.0155***	0.0041***	0.0119***
		(0.0016)	(0.0035)	(0.0015)	(0.0035)	(0.0014)	(0.0028)
CR × DEDUCTIBILITY	−	−0.0049**	−0.0103***				
		(0.0019)	(0.0034)				
CR × LOW_TAX_ENFORCEMENT	−			−0.0046**	−0.0126***		
				(0.0018)	(0.0040)		
CR × LOW_TAX_RATE	−					−0.0031*	−0.0092**
						(0.0018)	(0.0045)
Joint significance $\partial f(\ )/\partial CR$	+	0.0030**	0.0101***	0.0041***	0.0137***	0.0030**	0.0088***
		(0.0012)	(0.0026)	(0.0014)	(0.0031)	(0.0014)	(0.0028)
Controls for main effects		Yes	Yes	Yes	Yes	Yes	Yes
Controls		Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects		Yes	Yes	Yes	Yes	Yes	Yes
Industry-year fixed effects		Yes	Yes	Yes	Yes	Yes	Yes
No of obs.		65,187	65,187	64,663	64,663	65,187	65,187
Adj. R^2		0.813	0.286	0.814	0.286	0.808	0.286
Within R^2		0.049	0.007	0.053	0.007	0.037	0.007

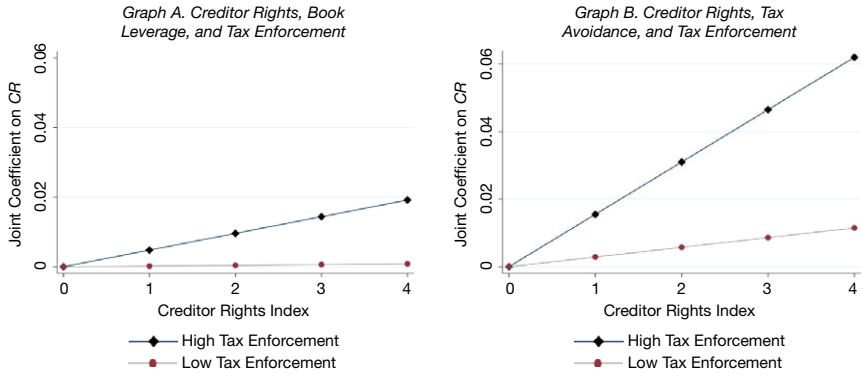
indicates that, for a deductibility index of 0, creditor protection increases the use of debt financing and reduces corporate tax avoidance. Furthermore, we find that the interaction between CR and DEDUCTIBILITY is negative and statistically significant in both specifications. These results suggest that, since debt and equity are equally tax-deductible or since alternative non-debt tax shields are available, the incremental benefit of using debt (avoiding taxes) due to creditor protection decreases (increases). Therefore, debt financing and tax avoidance become less responsive to creditor protection laws. In economic terms, these results indicate that, for the category with the lowest DEDUCTIBILITY values, an increase in creditor protection laws increases BOOK_LEVERAGE by 0.6 percentage points and GAAP_ETR by 1.6 percentage points. For the middle category, the effect decreases substantially by 0.4 percentage points (or 67%) to around 0.2 percentage points for BOOK_LEVERAGE, and by 1 percentage point (or 63%) to around 0.6 percentage points for GAAP_ETR. For the category with the highest DEDUCTIBILITY values, the creditor protection effects become nonsignificant. Importantly, the effects differ across DEDUCTIBILITY categories since the coefficient on CR × DEDUCTIBILITY is statistically significant at the 5% level (or higher).

The second variable proxying for whether a firm could find it less beneficial to substitute away from tax avoidance toward debt financing is the strength of a country's tax enforcement. Firms located in countries with weaker tax enforcement have more tax avoidance opportunities (e.g., Hoopes, Mescall, and Pittman (2012)) and thus find it easier to use non-debt tax shields, such as tax avoidance, to lower the

FIGURE 5

Role of Tax Enforcement in Creditor Rights, Lending, and Tax Avoidance

Figure 5 illustrates the results in columns 3 and 4 of Table 9. Graph A (Graph B) uses BOOK_LEVERAGE (GAAP_ETR) as the dependent variable. The model specification includes firm controls, country controls, firm, and industry-year fixed effects. The *x*-axis is the creditor rights index, and the *y*-axis represents the joint coefficient of CR for high- and low-tax enforcement firms, respectively.



tax burden. We rely on the 2015 OECD Tax Administration Guide and collect data on the tax administration expenditure as a percentage of GDP (OECD (2015b)). We use this ratio as a measure of tax enforcement since it captures what proportion of a country's resources in terms of GDP are expended by the government to administer and enforce tax laws.[37] We then split countries in the bottom tercile to sort them according to low versus high levels of tax enforcement with the variable LOW_ TAX_ENFORCEMENT.[38] Columns 3 and 4 of Table 9 present the regression results. The main coefficient on CR is positive and statistically significant at the 1% level in both specifications. This coefficient captures the debt and tax avoidance responses of firms with low tax avoidance opportunities (i.e., high tax enforcement). These firms have fewer opportunities to reduce the tax burden through tax avoidance and prefer to use debt tax shields when creditor protection strengthens. However, the debt response to creditor protection weakens if firms can avoid taxes (i.e., a negatively significant coefficient on CR × LOW_TAX_ ENFORCEMENT). This result indicates that non-debt tax shields, such as tax avoidance, reduce the benefit of debt tax shields. Figure 5 provides a graphical illustration of these results using the coefficient estimates from columns 3 and 4 of Table 9. We plot the joint CR coefficient (*y*-axis) as a function of the creditor rights index (*x*-axis) for firms with low tax avoidance opportunities (LOW_ TAX_ENFORCEMENT = 0) and high tax avoidance opportunities (LOW_TAX_ ENFORCEMENT = 1). Both panels show that, for the lowest category of CR, there is no difference between the two groups. As the CR index

[37]The 2015 OECD Tax Administration Guide is available from the OECD's website (https://read.oecd-ilibrary.org/taxation/tax-administration-2015_tax_admin-2015-en#page184, last accessed Oct. 24, 2021). Note also that we do not observe tax enforcement data for Greece, Peru, or the Philippines, which, in our sample, correspond to around 524 firm-year observations.

[38]The results are qualitatively unchanged if we use quartile splits.

increases, the difference between the two groups increases. In countries with the strongest creditor protection, the difference in BOOK_LEVERAGE is around 1.8 percentage points, whereas it is around 5 percentage points for GAAP_ETR. Importantly, the differences in the effect between the two groups are also significantly different from each other. Collectively, these results illustrate that creditor protection laws and the strength of a country's tax enforcement jointly shape a firm's trade-off between debt and non-debt tax shields.

Next, we examine the role of the corporate tax rate in mitigating the incentives to substitute tax avoidance with debt. The idea is that debt tax shields are less valuable for firms subject to low statutory tax rates (Graham (2000), Heider and Ljungqvist (2015)). We split countries based on the level of the corporate tax rate to sort them according to low versus high levels of corporate tax rate with the variable LOW_TAX_RATE. In line with the previous analyses, this indicator variable is equal to 1 if the corporate tax rate is below the bottom tercile in a year, and 0 otherwise. In countries with high tax rates, we find that stronger creditor rights increase (reduce) debt financing (tax avoidance), as suggested by the positive and statistically significant coefficient of CR in columns 5 and 6 of Table 9. These effects are significantly weaker in low-tax countries since the interaction between CR and LOW_TAX_RATE is negative and statistically significant. In line with this result, we also find that the joint coefficients of CR and CR $\times$ LOW_TAX_RATE are significant at the 5% level (or higher).

VI. Conclusion

This article investigates the effect of creditor rights on lending and corporate tax avoidance using a setting of high internal validity and exploiting multiple bankruptcy reforms in Italy over the period of 2003 to 2011. We establish the external validity of our findings in an international panel across 33 countries over the period of 2004 to 2013. Both the Italian setting and the broader international setting show that firms take on more debt and reduce tax avoidance when creditor rights become stronger, consistent with firms trading off debt and non-debt tax shields. The effects of creditor rights on debt and tax avoidance are economically significant, with the elasticity of book leverage and ETR to changes in creditor rights being generally higher than those of the other control variables for the average firm in the Italian setting. The magnitudes of the debt and tax avoidance responses to creditor rights are also economically significant when estimated using the international panel data. Moreover, we find that the effects of creditor rights are shaped by tax system characteristics. Firms located in countries where the tax code provides alternative non-debt tax shields, the tax enforcement is weaker, or the statutory corporate tax rate is lower have fewer incentives to increase debt and to reduce tax avoidance when creditor rights are stronger.

These findings highlight institutional interdependences between creditor protection laws and tax laws and have important implications for the debate on designing the regulatory framework and the fight against tax avoidance. In recent years, countries around the world have been moving toward harmonizing their regulatory frameworks. One prominent example is Regulation 2015/848, which

sets out common criteria to ensure the efficient administration of bankruptcy proceedings involving firms with business activities or financial interests in the European Union.[39] With regard to taxation, despite the efforts to protect the corporate tax base and the adoption of important reforms in line with the OECD/G20 Base Erosion and Profit Shifting Project, corporate tax avoidance continues to represent a major concern for many countries (OECD (2020)).

The various analyses we perform in this article highlight interdependencies among country legal institutions. While strengthening the protection granted to creditors seems to have a deterring effect on tax avoidance, unilateral changes in bankruptcy law might still not yield the desired outcome of curbing tax avoidance if not combined with a thorough analysis of tax system characteristics. A key message is that creditor protection laws and tax laws cannot be considered in isolation, and that these rules can be less effective if they do not consider all the institutional factors that affect firms' tax avoidance incentives.

Appendix A. Variable Definitions: Italian Setting

Firm-Level Variables

BOOK_LEVERAGE: Total debt (CULI + LTDB) scaled by total assets (TOAS).

TOTAL_INTERESTS: Interests and related expenses (INTE) relative to total assets (TOAS).

GAAP_ETR: Income taxes (TAXA) divided by pretax income (PLBT). The variable is bounded between 0 and 1.

TAXES_PAID: Income taxes (TAXA) divided by the firm's total assets (TOAS).

FIRM_SIZE: Natural logarithm of the firm's total assets (TOAS).

INTANGIBLES: Intangible assets (IFAS) relative to total assets (TOAS).

INCOME: Earnings before interest, taxes, depreciation, and amortization (EBTA) relative to the prior year's total assets (TOAS).

PPE: Ratio of PPE (FIAS) relative to the prior year's total assets (TOAS).

SALES_GROWTH: Natural logarithm of the growth rate of sales (OPRE) from years $t-1$ to t.

INVESTMENT: Change in fixed assets (TFAS) before depreciation (DEPR) relative to the prior year's total assets (TOAS).

CASH: Cash and short-term investments (CASH) scaled by lagged total assets (TOAS).

Z_SCORE: The firm's Altman Z-score for private firms, calculated as [3.107(EBTA/TOAS)] + [0.717 × (WKCA/TOAS)] + [0.998 × (OPRE/TOAS)] + [0.847 × (ΔSHFD/TOAS)] + [0.42 × (SHFD/(CULI + LTDB)].

Source: Amadeus.

[39]See European Union Regulation 2015/848, which entered into force on June 26, 2017 (available at https://eur-lex.europa.eu/legal-content/en/TXT/?uri=LEGISSUM:230203_2, last accessed Oct. 6, 2021).

Creditor Rights Indicator

CR: Creditor rights index constructed according to the methodology of La Porta et al. (1997), (1998) and using the bankruptcy reforms in Table 1. We normalize it to the range of 0 and 4.

HIGH_ENFORCEMENT: Indicator variable that takes the value of 1 (0) for provinces whose number of bankruptcy proceedings days is below (above) the median of the distribution of bankruptcy proceedings days across the 103 Italian provinces in 2003.

Sources: Italian Bankruptcy Code, Italian Ministry of Justice, and ISTAT

Province-Level Variables

GDP per capita: Natural logarithm of the GDP per capita in 2010 euros.

Source: Sistema degli indicatori sociali regionali e provinciali

Appendix B. Variable Definitions: Cross-Country Setting

Firm-Level Variables

BOOK_LEVERAGE: Total debt (DLC + DLTT) relative to total assets (AT).

TOTAL_INTERESTS: Interests and related expenses (XINT) relative to total assets (AT).

GAAP_ETR: Income taxes (TXT) divided by pretax income less special items (PI − SPI). The variable is bounded between 0 and 1.

TAXES_PAID: Income taxes (TAXA) divided by the firm's total assets (AT).

NO_OF_TAX_HAVENS: Natural logarithm of the firm's number of tax havens subsidiaries plus 1. We classify countries as tax havens if they belong to the OECD's list of uncooperative tax havens.

TAX_HAVEN_USE: Indicator variable taking the value of 1 if the firm has tax haven subsidiaries in a given year, and 0 otherwise.

FIRM_SIZE: Natural logarithm of the firm's total assets (AT).

ACCRUALS: The sum of changes in net non-cash working capital (ΔWC), net non-current operating assets (ΔNCO), and net financial assets (ΔFIN) (Atwood et al. (2012)).

MARKET_TO_BOOK: Common shares outstanding (CSHO) multiplied by the stock price at the fiscal year-end (PRCCF), divided by total common equity (CEQ).

PAYOUT: Indicator variable taking the value of 1 if the firm pays dividends, and 0 otherwise.

R&D: Research and development expenses (XRD) relative to total sales (SALE). We replace missing values with 0 (Dyreng, Hanlon, and Maydew (2010)).

INTANGIBLES: Intangible assets (INTAN) relative to total assets (AT).

INCOME: Earnings before interest, taxes, depreciation, and amortization relative to the prior year's total assets (AT).

PPE: Ratio of PPE (PPEGT) relative to the prior year's total assets (AT).

CASH: Cash and short-term investments (CHE) scaled by lagged total assets (AT).

Z_SCORE: The firm's Altman *Z*-score, calculated as [3.3(EBIT/AT)] + [1.2 × (WCAP/AT)] + [0.999 × (SALE/AT)] + [1.4 × (RE/AT)] + [0.4 × (CEQ/AT)].

INVESTMENT: Capital expenditures (CAPX) relative to the prior year's total assets (AT).

SALES_GROWTH: Natural logarithm of the growth rate of sales (SALE) from year $t-1$ to t.

Sources: Compustat North America and Compustat Global, Orbis, and OECD

Country-Level Variables

CR: The strength of the creditor rights index from the World Bank Doing Business reports normalized to the range of 0 and 4.

CR (major reforms): Indicator variable taking the values of 1 (if creditor rights increased in country k in year t) or − 1 (if creditor rights decreased in country k in year t), and 0 otherwise.

DEDUCTIBILITY: Index that measures the extent to which financing costs are tax deductible in a given country k in year t. This index theoretically ranges from 0 (very low deductibility) to 2 (very high deductibility, with allowances for corporate equity, no thin capitalization rules, loss carryback rules, and loss carryforward rules from a minimum of 6 years, with no maximum).

LOW_TAX_ENFORCEMENT: Indicator variable that takes the value of 1 if the tax administration expenditure relative to the GDP in country k, industry j, and year t is in the lower tercile, and 0 otherwise.

LOW_TAX_RATE: Indicator variable that takes the value of 1 if the corporate tax rate in country k, industry j, and year t is in the lower tercile, and 0 otherwise.

MILLER_TAX_INDEX: [1 − (1 − corporate tax rate) × (1 − dividend tax)/ (1 − personal income tax)].

GDP per capita: Natural logarithm of the GDP per capita in 2005 U.S. dollars.

INFLATION: Rate of price change in country k as a whole, as measured by the annual growth rate of the GDP implicit deflator.

SHAREHOLDER_RIGHTS: Guillén–Capron (2015) shareholder protections index.

RULE_OF_LAW: Yearly estimate of a country's quality relating to the rule of law.

BANKRUPTCY_ENFORCEMENT: Indicator variable that takes the value of 1 for those countries whose number of bankruptcy proceedings years is below the median of the distribution of bankruptcy proceedings years across the 33 sample countries in 2004, and 0 otherwise.

Sources: World Bank, IMF, Bankruptcy Codes, KPMG, E&Y, and OECD

Supplementary Material

To view supplementary material for this article, please visit http://doi.org/10.1017/S0022109022001144.

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