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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.

Keywords: Government policy and regulation, bankruptcy, debt, capital structure, tax avoidance

JEL classification: G28; G32; G33; H26; K34; M41

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1. 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 et al., 1984; Graham, 2000; Kemsley and Nissim, 2002; Kahle and Shastri, 2005; Graham and Leary, 2011; 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 shields. Since different legal regimes and changes to regulation greatly shape the business environment in which firms operate (Baginski et al., 2002; Houston et al., 2019), it is vital to understand the role institutional factors play in capital structure choices (Haselmann et al., 2010) and corporate tax decisions (Wilde and Wilson, 2018).

In this paper, 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 et al., 1997, 1998; Djankov et al., 2007; Acharya et al., 2011a; Qi et al., 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 (Demirgüç-Kunt and Maksimovic, 1998, 1999; Levine, 1997, 1998, 1999; La Porta et al., 1998; 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 et al., 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 et al., 2011a, 2011b; 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 2003–2011. 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 December 2003 and was unrelated to the business cycle or other macroeconomic trends (Rodano et al., 2016; Favara et al., 2017). Second, the new bankruptcy law was unanticipated, and the entire legislative process proved to be fast since it lasted only four months (from December 2004 to April 2005). Furthermore, in subsequent years, the Italian Parliament amended the 2005 Bankruptcy Code three 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 et al. (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 zero and four, 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 one 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 one 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 zero (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 et al., 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 et al., 2012; De Simone, 2016; Shevlin et al., 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 paper 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 et al., 2020; El Ghoul et al., 2020).

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.

2. 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; Castro et

[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).

al., 2004; Djankov et al., 2007; Cumming et al., 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 et al. (2011a, 2011b), 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,

[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)).

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:

H1: *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*.

H2: *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*.

3. Research design and data

3.1 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 December 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 December 2004, the Italian government presented a draft of the reform to Parliament that was approved just four months later in April 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 zero to one 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 zero and four, 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

[3] Section 1 of the Online Appendix provides a detailed description of each reform and how it changes our creditor rights index. Moreover, Figure A1 and Table A1 of the Online Appendix 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*, August 27, 2014).

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 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).

3.2 Data, estimation strategy, and descriptive statistics

We use all available data on Italian firms from Bureau van Dijk's Amadeus database over the period 2003–2011.[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,

[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.

[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.

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 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 et al. (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:

$$D_t = \frac{P_t + P_{t+1}}{E_t + F_t} \times 365 \qquad (1)$$

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 zero otherwise. We define the two groups at the beginning of the sample period, as low economic growth rates in some geographic areas and the

[9] Section 2 of the Online Appendix provides a detailed description of the dataset construction.

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:

$$y_{i,t+1} = \alpha_0 + \beta_1 CR_t \times High\ Enforcement_{k,2003} + \beta_2 X_{i,t} + \beta_3 GDP_{k,t} + \upsilon_i + \varphi_l * \omega_t + \varepsilon_{i,t} \quad (2)$$

where $y_{i,t+1}$ 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 et al., 2008, 2010), we define *GAAP ETR* as income taxes divided by pretax income. We winsorize *GAAP ETR* at zero and one. The variable *CR* is a continuous creditor rights index ranging from zero to four, 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 H1) or lower ($\beta_1 < 0$, consistent with the demand-side view in H2) debt ratios and ETRs when creditor rights are stronger. Our specification controls for firm fixed effects (υ_i) and region–year fixed effects ($\varphi_l * \omega_t$). 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 economic and institutional environment.[13] For example, firms from Bari, Brindisi, Foggia, Lecce, and Taranto are all located

[10] In Table A2 of the Online Appendix, 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.

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

in the Apulia region, but they differ with respect to the province they belong to and the related debt enforcement. We add the vector ($X_{i,t}$) 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 (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%.

4. Results

4.1 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 H1. 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

[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.

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 re-estimate Eq. (2) but use interest payments over total 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 Eq. (2) and include the two-year leads and lags of *CR*. This test enables us to observe whether there is 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 (Panel A) and tax avoidance (Panel 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.

[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.

Finally, we assess the economic significance of our results following the approach of Faccio and Xu (2015). Specifically, we use the ex post observed 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 $[(dy/dx) \times STD(x)]$ and interquartile ranges $[(dy/dx) \times IQR(x)]$ to measure the effect of a change in creditor rights on firms' leverage and tax avoidance. A one 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.

4.2 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.

[16] Note that our fixed effects structure absorbs *CR* and *High Enforcement*, and we cannot estimate their elasticity. In untabulated analyses, we estimate Eq. (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.

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 two-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, 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 Table A3 of the Online Appendix we also examine the joint change in book leverage and tax avoidance when creditor rights change in a simultaneous system of equations using two-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 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 Table A4 of the Online Appendix 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.

5. 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

[17] In two-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 et al. (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 firms could have an incentive to increase tax avoidance to generate internal resources (Edwards et al., 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.

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.

5.1 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 zero and ten, we normalize it to the range of zero to four to be consistent with the Italian setting. Based on this method, we produce a continuous creditor rights index (*CR*) over the period 2004–2013 ranging from zero to four, with higher scores indicating stronger creditor rights.[18] Table 5 summarizes the sample countries and the average creditor rights index for each country over the period 2004–2013. 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 (zero) in Peru (Belgium, Hong Kong, Thailand, and the United Kingdom). This

[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 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 September 18, 2021). Third, we want to be consistent with the Italian setting and focus on a similar time period.

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 Panel 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 Panel 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] 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 Table A5 of the Online

[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 October 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 October 15, 2021).

Appendix, 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 three 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.

5.2 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:

$$y_{i,t+1} = \alpha_0 + \beta_1 CR_{k,t} + \beta_2 X_{i,t} + \beta_3 \prod_{k,t} + \upsilon_i + \varphi_m * \omega_t + \varepsilon_{i,t} \quad (3)$$

where $y_{i,t+1}$ 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 zero and one.[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 zero to four, as defined in Section 5.1.[23] In line with the supply-side view hypothesis, we expect

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

[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*

$\beta_1 > 0$. 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 et al., 2012; 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 non-indicator 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 two-digit SIC code level ($\varphi_m * \omega_t$). 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 et al. (2008) and cluster standard errors at the country–industry level to avoid small cluster bias from a limited number of countries.[26]

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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 October 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 et al., 2017). Columns (1) and (2) of Panel B of Table A6 of the Online Appendix show that our results are robust to the inclusion of such trend variables.

[26] In columns (3) and (4) of Panel B of Table A6 of the Online Appendix, 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 et al.

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%.

5.3 Baseline results

The baseline results from estimating Eq. (3) are presented in Table 7. In column (1), we find that an increase in the creditor rights index results in an increase 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 three countries (Brazil in 2005, Italy in 2005, and France in 2005) reduced it.[28] We then follow the methodology of Simintzi et al. (2015) and Dessaint et al. (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 one year before the sample period

(2004) and rerun Eq. (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 zero at conventional levels, suggesting that the main findings are not sensitive to the clustering method.

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

[28] Section 4 of the Online Appendix provides a detailed description of each reform.

(*CR major reforms*^{2000} = 0). For any given country *k* in year *t*, *CR major reforms* takes the value of 1 (if creditor rights became stronger) or −1 (if creditor rights became weaker), and zero 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 2001–2013 ranging between −1 and 1, with higher scores indicating stronger creditor rights.[29] We find that the coefficient of *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) to (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 Eq. (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

[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.

[30] In untabulated robustness tests, we estimate Eq. (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 zero and statistically nonsignificant. Furthermore, in Figure A4 of the Online Appendix, 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.

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 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 2004–2013.[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 one if a firm reports tax haven operations in a year, and zero otherwise (*Tax haven use*). We re-estimate Eq. (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 Eq. (3) while including the two-year lead and lag of the creditor rights indicator. Figure 4 presents a direct visualization of the lead–lag

[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 September 16, 2021).

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

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 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 one standard deviation increase in creditor rights. Furthermore, a one 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.

5.4 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 et al. (2018) and Alexander et al. (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

[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.

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 et al., 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 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; Dhaliwal et al., 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 zero (low deductibility) to two (high deductibility, with allowances for corporate equity, no thin capitalization rules, loss carryback, and rules on loss carryforward from a minimum of six years, with no maximum).[36] We then augment Eq. (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 indicates that, for a deductibility index of zero, creditor protection increases the use of debt financing and reduces corporate tax avoidance. Furthermore,

[34] Buettner et al. (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] Table A7 of the Online Appendix 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.

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 et al., 2012) and thus find it easier to use non-debt tax shields, such as tax avoidance, to lower the tax burden. We rely on the 2015 OECD Tax Administration Guide and collect data on the tax administration expenditure as a percentage of GDP. 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

[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 October 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.

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 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

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

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 one if the corporate tax rate is below the bottom tercile in a year, and zero 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* × *Low Tax Rate* are significant at the 5% level (or higher).

6. Conclusion

This paper 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 2003–2011. We establish the external validity of our findings in an international panel across 33 countries over the period 2004–2013. 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 paper 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.

[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 October 6, 2021).

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Appendix A. Variable definitions: Italian setting

Variable	Definition
Firm-level variables	Source: Amadeus
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 (2000) Z-score for private firms, calculated as [3.107(*EBTA*/*TOAS*)] + [0.717*(*WKCA*/*TOAS*)] + [0.998*(*OPRE*/*TOAS*)] + [0.847*(Δ*SHFD*/*TOAS*)] + [0.42*(*SHFD*/(*CULI* + *LTDB*)].
Creditor rights indicator	Sources: Italian Bankruptcy Code, Italian Ministry of Justice, and ISTAT
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.
Province-level variables	Source: Sistema degli indicatori sociali regionali e provinciali
GDP per capita	Natural logarithm of the GDP per capita in 2010 euros.

Appendix B. Variable definitions: Cross-country setting

Variable	Definition
Firm-level variables	Sources: Compustat North America and Compustat Global, Orbis, and OECD
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 (Δ*WC*), net noncurrent operating assets (Δ*NCO*), and net financial assets (Δ*FIN*) (Richardson et al., 2005; 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 et al., 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 (1968) 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*.
Country-level variables	Sources: World Bank, IMF, Bankruptcy Codes, KPMG, E&Y, and OECD
CR	The strength of 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.

Figure 1. Length of bankruptcy proceedings across Italian provinces

This figure 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).

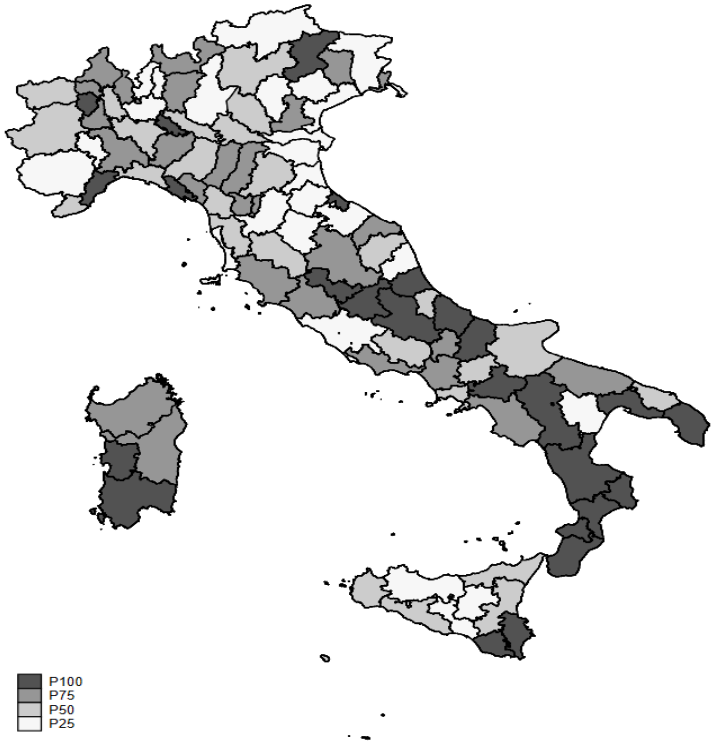
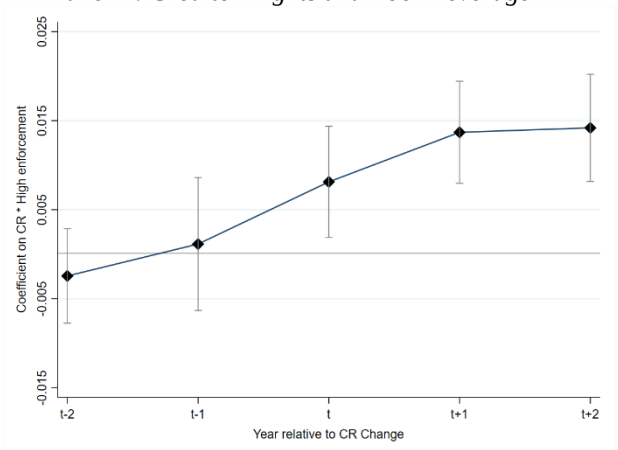


Figure 2. Cumulative changes in lending and tax avoidance: Italian setting

This figure plots the cumulative differences in the *Book Leverage* ratios and *GAAP ETR* values 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 Eq. (2). The connected line indicates the 95% confidence interval.

Panel A: Creditor Rights and Book Leverage



Panel B: Creditor Rights and Tax Avoidance

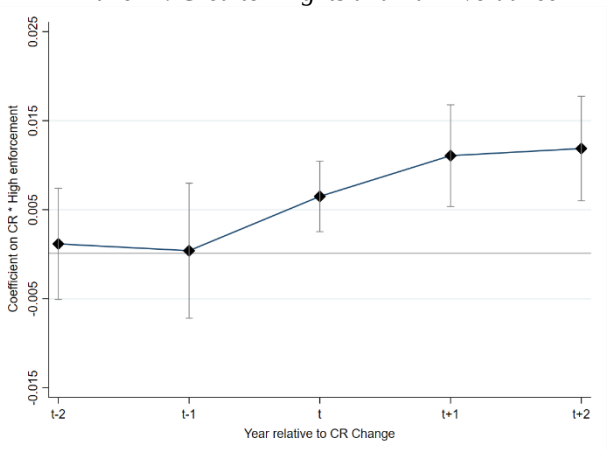


Figure 3. Creditor rights, private credit, and corporate tax revenue around the world

This figure depicts the relations between the strength of creditor rights and total private credit and corporate tax revenue, both expressed as a percentage of the GDP, for the 33 sample countries from 2004 to 2013.

Panel A: Creditor Rights and Private Credit *Panel B: Creditor Rights and Tax Revenue*

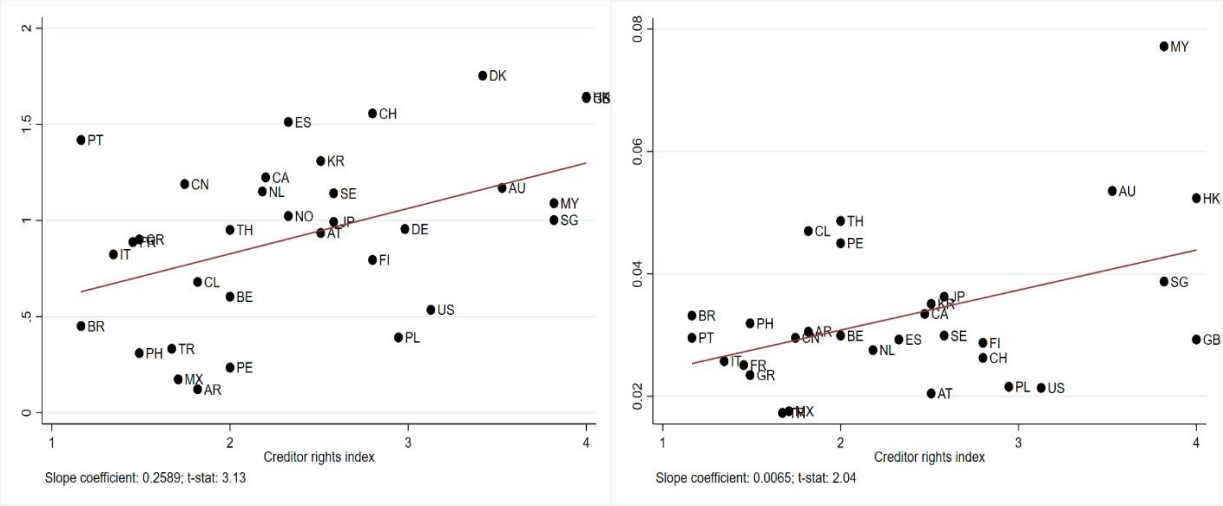


Figure 4. Cumulative changes in lending and tax avoidance: Cross-country setting

This figure plots the cumulative differences in the *Book Leverage* ratios and *GAAP ETR* values 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 Eq. (3). The connected line indicates the 95% confidence interval.

Panel A: Creditor Rights and Book Leverage *Panel B: Creditor Rights and Tax Avoidance*

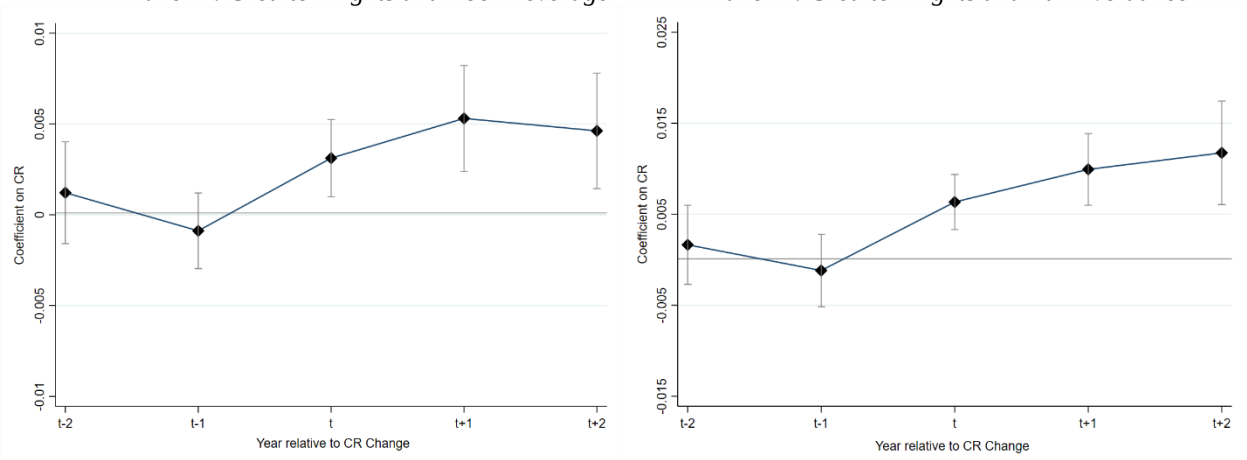
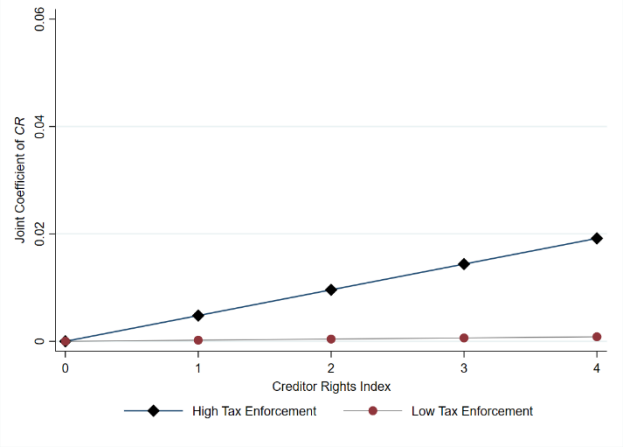


Figure 5. Role of tax enforcement in creditor rights, lending, and tax avoidance

This figure illustrates the results in columns (3) and (4) of Table 9. 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.

Panel A: Creditor Rights, Book Leverage, and Tax Enforcement



Panel B: Creditor Rights, Tax Avoidance, and Tax Enforcement

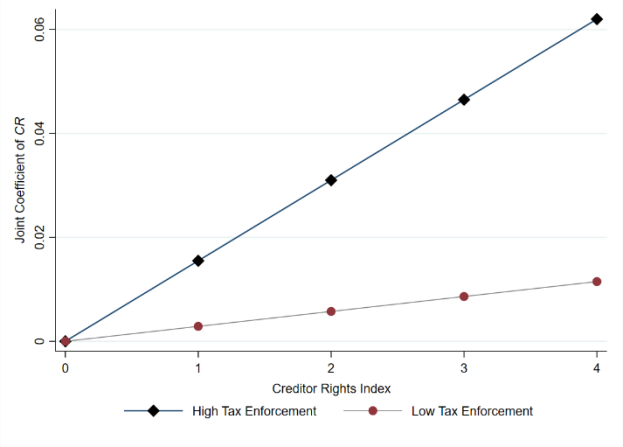


Table 1. Bankruptcy reforms and creditor rights index in Italy, 2003–2011

This table presents the ten 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

Table 2. Summary statistics: Italian setting

This table 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

Table 3. Creditor rights, lending, and tax avoidance: Italian setting

This table 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 zero 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 (two 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*** **	**0.0005** **	**0.0129** **	**0.0018** **
	(0.0032)	**(0.0002)**	**(0.0055)**	**(0.0008)**
Firm size	0.0001	0.0033***	0.0051***	-0.0453***
	(0.0014)	(0.0002)	(0.0015)	(0.0012)
Intangibles	0.0192***	0.0025***	0.0162	0.0047***
	(0.0054)	(0.0006)	(0.0139)	(0.0014)
Income	-0.0436***	-0.0018***	-0.4438***	-0.0272***
	(0.0035)	(0.0002)	(0.0189)	(0.0016)
PPE	0.0130***	0.0004***	0.0685***	0.0057***
	(0.0018)	(0.0001)	(0.0032)	(0.0009)
Sales growth	0.0056***	-0.0001***	-0.0214***	0.0056***
	(0.0005)	(0.0000)	(0.0018)	(0.0002)
Investment	0.0069***	0.0008***	0.0076**	0.0001
	(0.0019)	(0.0001)	(0.0036)	(0.0007)
Cash	0.0014	-0.0011***	0.0828***	0.0045***
	(0.0010)	(0.0001)	(0.0049)	(0.0006)
GDP per capita	-0.0082	0.0002	0.0088	0.0012
	(0.0062)	(0.0004)	(0.0060)	(0.0024)
Firm fixed effects	Yes	Yes	Yes	Yes
Region–year fixed effects	Yes	Yes	Yes	Yes
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

Table 4. Creditor rights, lending, and tax avoidance: Robustness tests, Italian setting

This table 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 zero. 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 two-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 two-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 zero 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 zero 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 (two 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)

Table 5. Sample composition and country-specific statistics

This table 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

Table 6. Summary statistics: Cross-country setting

This table 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

Table 7. Creditor rights and lending: Cross-country setting

This table 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 zero 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 (two tailed), respectively. Appendix B provides the variable definitions.

	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
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

Table 8. Creditor rights and tax avoidance: Cross-country setting

This table 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 zero 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 (two tailed), respectively. Appendix B provides the variable definitions.

	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
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

Table 9. Role of the tax system in creditor rights, lending, and tax avoidance: Cross-country setting

This table 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 (two 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 ∂f( )/∂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
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

The Role of Creditor Protection in Lending and Tax Avoidance

Antonio De Vito and Martin Jacob

Online Appendix

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1. Italian bankruptcy reforms

1.1 Preliminary analysis

To provide empirical evidence on the role of creditor protection on lending and tax avoidance, we exploit four bankruptcy reforms in Italy that either weakened or strengthened creditor rights over the period 2003–2011. Figure A1 illustrates the timeline of the bankruptcy reform process over the sample period. Before proceeding, we perform two analyses to examine the institutional setting upon which we base our empirical tests. First, we collect data on the approval process of the reforms from the Italian Parliament's website (https://www.normattiva.it) to ensure that there was strong political support to amend the 1942 Bankruptcy Code and no uncertainty about the completion of the reforms. Table A1 shows that all reforms were approved by a vast majority of the parliament members, or a large majority of government members if the government received a parliamentary mandate to act on its behalf. Specifically, the average approval rate in the House of Representatives (Senate) is about 55% (58%) over the sample period.

Second, to alleviate the concern that other policy changes passed around the reforms could drive our results, we gather information on laws and decrees that were passed around each reform from the Italian Parliament's website. Specifically, we perform a systematic keyword search to filter relevant laws and decrees using the following keywords: *firms, corporate tax, corporate income tax,* and *corporate law*.[1] This process yields 91 unique laws and decrees. We then read each law and decree and conclude that there were no significant changes in corporate law and tax law that could have meaningfully affected firms' lending and tax avoidance practices over the sample period.

[1] The corresponding Italian keywords are *imprese, fiscalità d'impresa, reddito d'impresa,* and *diritto societario*.

1.2 Analysis of the reforms and construction of the creditor rights index

We now proceed with the analysis of each reform and its effect on our creditor rights index. In 2005, the Italian Parliament enacted the first major bankruptcy reform that substantially modified the 1942 Bankruptcy Code. In the spirit of U.S. Chapter 11, the reform amended articles 67, 160, 161, 163, 167, 180, and 181 of the 1942 Bankruptcy Code and added article 182-*bis*. These provisions aimed to facilitate the renegotiation of outstanding loans and to protect the debtor. Under the 1942 Bankruptcy Code, debt reorganization procedures were subject to a number of restrictions that significantly inhibited the debtor's power to start a reorganization. First, there was no automatic stay of creditor claims. Second, for the debtor's proposal to be ratified, the law required a qualified majority of two-thirds of votes. Third, there was no cramdown provision and creditors could oppose the debtor's reorganization plan and nullify it at any time. Since the reform, the debtor can initiate the reorganization phase unilaterally, under the protection of the automatic stay rule. The reform has also reduced to one-half the share of votes required to ratify a debtor's reorganization plan, thereby weakening creditor approval rights. Moreover, a cramdown provision has been put into law that allows the bankruptcy judge to impose a debtor's reorganization plan despite objections from creditors. Taken together, the automatic stay, creditor approval, and cramdown provisions introduced by the 2005 reform decrease our creditor rights index by 0.30.

With the 2005 bankruptcy reform, the Parliament also mandated the government to modify another bankruptcy proceeding, namely, liquidation, in line with U.S. Chapter 7.[2] During the first quarter of 2006, the government enacted the second reform, which aimed to strengthen creditor rights in liquidation by modifying articles 19, 32, 38, 102, 104, 105, 107, 116, 119, 125, 144, 155,

[2] Note that, even if the amending reform was mandated by Parliament and implemented later by the government, it was very difficult to form expectations until the measure was actually implemented. This is due to the typical last-minute political deals within coalition governments, which are usually impossible to predict.

and 156 of the 1942 Bankruptcy Code and adding two articles, 111-*bis* and 111-*quater*. The reform also allowed creditors to organize themselves in a committee and subjected the appointment of the bankruptcy administrator in charge of liquidating assets to the approval of the creditors' committee. Moreover, all the bankruptcy administrator's strategic actions related to the liquidation of assets must now be approved by the creditors' committee. Overall, by allowing creditors to set up a committee and subjecting the bankruptcy administration's appointments and actions to the creditors' approval, the reform strengthened creditor rights in liquidation and increases our creditor rights index by 0.2.

In a further attempt to spur debt restructuring plans in lieu of liquidation, the government approved new amendments to the 1942 Bankruptcy Code on September 12, 2007, that became effective on January 1, 2008. These amendments significantly limited the supervisory actions of the judge and the rights of creditors to appeal a debt restructuring plan. Based on this change to *Court supervision* and judicial power in debt restructuring, our creditor rights index decreases by 0.10.

Finally, on July 30, 2010, the Italian Parliament approved another comprehensive law involving debt restructuring. Article 48 of law No. 122 added the article 182-*quater* and modified the articles 182-*bis* and 217 of the 1942 Bankruptcy Code. The law limited creditors' power to approve debt restructuring plans and introduced super priority financing and moratoria provisions in debt restructuring plans supervised by the court, thereby substantially weakening creditor rights. These changes strengthened the debtor's bargaining power at the restructuring and reorganization stages and decrease our creditor rights index by 0.30.

To conclude, multiple bankruptcy reforms took place over the sample period that either increased or decreased creditor protection for each of the four bankruptcy proceedings. Hence, in

the analyses, we use a very granular creditor rights index to take into account the distinct changes to reorganization and liquidation proceedings. However, at the same time, we also note that overall creditor protection decreased over the sample period, with the Italian Bankruptcy Code progressively leaning from a pro-creditor approach, with liquidation being the preferred method to resolve bankruptcy, toward a pro-debtor approach, with debt restructuring and reorganization being preferred to preserve the continuation of viable businesses. This new paradigm also emerged in the parliamentary debate and in the accompanying illustrative reports to Parliament, which suggest that the reforms aimed to foster the continuation of business activity with a stronger focus on debt restructuring and reorganization than on liquidation.[3]

2. Dataset construction: Italian setting

To answer our research question, we use all available data on Italian firms from Bureau van Dijk's Amadeus database over the period 2003–2011. Amadeus is a subset of Orbis marketed by Bureau van Dijk, which covers European firms. To collect firm-level data, Bureau van Dijk relies on chambers of commerce, securities commissions, tax authorities, as well as on established national and international data providers. In Italy, Bureau van Dijk has an agreement with Cerved, which is the largest data provider of firm-level data in the country and is listed on the Milan stock exchange.

[3] "*L'attuale disciplina si ispira ad una finalità essenzialmente liquidatoria dell'impresa insolvente e ad una tutela accentuata dei diritti dei creditori, determinando un completo spossessamento del patrimonio del debitore che viene posto in una condizione di assoluta incapacità di disporre, anche con effetti extra concorsuali e di tipo personale del proprio patrimonio. In tale quadro, la finalità recuperatoria del patrimonio imprenditoriale ha finito per trovare collocazione secondaria rispetto allo scopo sanzionatorio del fallimento. Si tratta di una procedura che non risulta più adeguata alle finalità che la evoluzione socio-economica intende realizzare nelle situazioni di insolvenza imprenditoriale.... Muovendo dall'attuale sistema normativo concorsuale, qualsiasi tentativo di riforma della materia deve ispirarsi ad una nuova prospettiva di recupero delle capacità produttive dell'impresa, privilegiando il ricorso alla via del risanamento e del superamento della crisi aziendale*" (available in the original language at http://www.ilsole24ore.com/art/SoleOnLine4/Speciali/2006/guida_professionisti/22giugno2006/Relazione_DLGS_5_2006.pdf?cmd%3Dart, last accessed October 15, 2021).

In our analyses, we use Amadeus' unconsolidated financial statements of listed and unlisted firms, with exact information on the address of each sample firm. Unlike consolidated balance sheet data, the advantage of using unconsolidated balance sheet data is that we can reliably identify the location of the activities of a single firm within the country. Using the postal code of each firm, we then merge unconsolidated balance sheet data with the bankruptcy proceeding durations of each Italian province in 2003, which is the year when we construct treatment and control groups.

The data on the length of bankruptcy proceedings can be downloaded from the Italian National Institute of Statistics' website (https://dati.istat.it). Specifically, the bankruptcy data can be found in the "*Giustizia e Sicurezza*" section and in the "*protesti e fallimenti*" subsection. The file *fallimenti serie interrotte 1990–2007* should be used for the analyses.[4] Note that the data vary at the province–year level.[5] Hence, to successfully merge the province-level data with firm-level data, one must first assign the municipality in which the firm operates to the province to which the municipality belongs. To merge municipalities with their corresponding province, we suggest using the list of Italian municipalities, which can be downloaded from the Italian National Institute of Statistics' website (https://www.istat.it/storage/codici-unita-amministrative/Elenco-comuni-italiani.xls).

To ensure that economic and institutional conditions do not spuriously drive the results, Eq. (2) controls for the level of local economic development of the province, such as the GDP per capita. Statistics on local GDP per capita can be downloaded from the Istituto di Ricerche Economico Sociali (IRES) Piedmont's website (https://www.sisreg.it) in the section "*PIL*

[4] Note that, since 2007, the National Institute of Statistics no longer collects data on bankruptcy proceedings. To download the data for recent years, we refer the reader to the Italian Ministry of Justice's website (available at https://reportistica.dgstat.giustizia.it, last accessed October 13, 2021).

[5] In Italy, the province is an administrative unit that is comparable to the county in the United States.

procapite." IRES Piedmont is a public research center that is controlled by the Piedmont region and collects data on local economic and institutional conditions in Italy.

To strengthen the causal interpretation of our findings, we also corroborate the firm-level evidence (that creditor protection reduces corporate tax avoidance) with an aggregate analysis using the corporate tax returns of all incorporated firms in Italy aggregated at the region–year level.[6] The idea is that all firms in our Amadeus sample are also mandated to file tax returns and should thus be included in the aggregated tax return data. The data on aggregated tax returns are publicly available and can be downloaded from the Italian Ministry of Economy and Finance's website (https://www.finanze.gov.it) in the section "*Dati e statistiche*" and the subsection "*Dichiarazioni fiscali*." Specifically, one must look for the data on *IRES*, which is the term for corporate income tax in Italy, and for the aggregated tax returns filed by stand-alone firms (*singole società*). Note that, in addition to controlling for local economic conditions and tax enforcement (see also Section A3 below), in these analyses presented in Table A4, we include a proxy for bank branch penetration (Jappelli and Pagano, 2002). The data on bank branch penetration can be downloaded from the Bank of Italy's website (https://infostat.bancaditalia.it).

3. The role of tax enforcement in Italy

To alleviate the concern that a change in tax enforcement could drive our results—particularly the decrease in tax avoidance—we proceed as follows. We gather information on the average number of tax staff working at the central government tax agency across the 20 Italian regions over the period 2003–2011 from the Italian Ministry of Economy and Finance's website.[7] We then classify this information into four Italian economic regions (i.e., the northeast, northwest, central, and

[6] Note that this sample starts in 2004 because of data availability. In total, the sample comprises 160 region–year observations (i.e., eight years from 2004 to 2011 times 20 Italian regions).

[7] The data can be downloaded from the Italian Ministry of Economy and Finance's website (https://www.contoannuale.mef.gov.it/en/struttura-personale/occupazione, last accessed October 13, 2021).

southern areas) and plot the trends in tax enforcement in Figure A2. A casual observation of Figure A2 immediately shows that the distribution of tax staff is uneven across economic regions and over the sample period, with the northwestern regions having the highest number of tax staff. However, this distribution mirrors the regional variation in economic development within Italy, with the regions in southern Italy being less developed than the regions in the north, thus needing proportionally (relative to the number of firms) fewer tax employees (e.g., Guiso et al., 2004; Pinotti, 2015).

We further notice that the trends in tax enforcement are stable across economic regions and over the sample period, the only exception being the northwest area, in which we observe an increase in tax enforcement starting from 2008 onward. To shed light on the trends as well as on the increase in tax enforcement from 2008 onward, we then collect data on the number of job posts advertised on the Italian tax agency's website over the sample period. The underlying idea is that a significant change in tax enforcement from 2008 onward would require the government to provide substantial additional resources, including increasing the tax agency's workforce (OECD, 2015).[8] Note that, in Italy, the process of hiring tax staff is centralized and managed by the general department of the tax authority in Rome, which is responsible for selecting and allocating new employees to regional units, depending on the budget as well as on audit needs. Hence, by gathering data on job openings on the tax agency's website, we capture most changes in the composition of tax enforcement staff across regions and over time.

[8] Anecdotal evidence suggests that, when governments want to curb tax avoidance, they tend to increase the tax agency's budget and staff. See, for example, the Biden administration's plan to raise $700 billion in tax revenue by providing the Internal Revenue Service with additional funds and enforcement staff (available at https://www.nytimes.com/2021/05/20/business/IRS-tax-gap.html, last accessed October 13, 2021). Similarly, in Italy, the government is currently planning to curb tax avoidance by providing the tax agency with additional resources and enforcement staff (available at https://www.corriere.it/economia/lavoro/21_settembre_22/fisco-svolta-digitale-dell-agenzia-entrate-due-bandi-nuovi-controllori-a1eb32e2-1b8b-11ec-8752-2a4387430cab.shtml, last accessed October 13, 2021).

We find that the central government tax agency advertised the following job positions across all job functions and levels:[9]

- 2004 → 827 middle-level management positions,[10]
- 2005 → 1,644 middle-level management positions,
- 2006 → no job posts,
- 2007 → 507 middle-level management positions,
- 2008 → 2,010 middle-level management positions,
- 2009 → nine middle-level management positions,
- 2010 → nine middle-level management positions,
- 2011 → 243 middle-level management positions.

Consistent with the increasing trend in tax enforcement observed in Figure A2, we find that the number of additional units hired in 2008 is substantially higher than in the previous two years, with more than 50% of the vacancies located in the northwestern regions (i.e., 1,075 out of 2,010 in total, of which 1,005 were allocated to the two wealthiest Italian regions, namely, Lombardy and Piedmont). Hence, one potential concern is that these regions could drive tax avoidance changes. Although we include either region–year or economic region–year fixed effects throughout all the analyses to control for regional differences in economic development and tax enforcement, in Figure A3 we perform an additional test and show that the results are robust to

[9] The data can be downloaded from the Italian central government tax agency's website (available at https://www.agenziaentrate.gov.it/portale/web/guest/agenzia/amministrazione-trasparente/bandi-di-concorso/concorsi-conclusi, last accessed October 13, 2021).

[10] The calls to apply for middle management positions typically require candidates to have at least a bachelor's degree in economics, statistics, business, or law. Successful candidates will be hired as *funzionari* (i.e., officials), who mainly assist taxpayers in applying the law (i.e., before filing tax returns) and in auditing tax returns (i.e., after tax returns are filed). The salary of middle management positions is usually fixed and cannot be negotiated with the tax authority. Moreover, there is no incentive-based compensation, which could affect audit outcomes.

excluding firm–year observations from those regions that experience an increase in tax staff and resources.

4. Major bankruptcy reforms around the world

To test the robustness of our cross-country results, we exploit six major bankruptcy reforms across 33 countries over 2001–2013. As a general rule, creditor rights are considered strong (weak) when creditors (do not) have control over a debtor's reorganization phase, as well as when the bankruptcy code provides creditors with priority claim rules over the liquidation process. Following this approach, we identify three increases in creditor rights—Spain in 2004, United States in 2005, and Germany in 2012—and three decreases in creditor rights—Brazil in 2005, France in 2005, and Italy in 2005.

Starting with increases in creditor rights, in 2004, Spain amended its bankruptcy code (*Ley Concursal*) and introduced a priority rule such that secured creditors are paid first from the proceeds of liquidation. According to Djankov et al. (2007) and John et al. (2021), this reform resulted in stronger creditor rights. In 2005, the United States enacted the Bankruptcy Abuse Prevention and Consumer Protection Act (BAPCPA). Although the aim of the law was to reform consumer bankruptcy, it also improved Chapter 11 creditor rights (Sautner and Vladimirov, 2017). More specifically, the reform brought about two mandatory caps: one of 18 months for borrowers to file a reorganization plan and one of 20 months for the plan's acceptance by creditors. These caps widely limit a debtor's ability to protract the duration of bankruptcy proceedings and give leeway to creditors over the renegotiability of debt. Relatedly, the BAPCPA reform introduced an additional cap of seven months for debtors in which to assume or reject a lease. Overall, the introduction of these caps significantly redistributed the bargaining power from debtors to creditors.

In 2012, Germany also reformed its bankruptcy code (Law on Corporate Reorganization). In this case, the law increased creditors' rights by giving them more control over the bankruptcy proceedings and the appointment of the insolvency administrator. Furthermore, the reform limited a debtor's ability to appeal a restructuring plan approved by the majority of creditors (Sautner and Vladimirov, 2017).

In 2005, three countries in our sample decreased creditor rights: Brazil, France, and Italy. The Brazilian bankruptcy reform (Law on Insolvency) became law, in the spirit of U.S. Chapters 7 and Chapter 11 (Alencar and Ponticelli, 2016). More specifically, it introduced an automatic stay rule on all litigations against the debtor and facilitated the debtor's ability to renegotiate with creditors (Favara et al., 2017). Although the aim of the reform was broader, it arguably weakened creditor rights. Similarly, France amended the provisions of automatic stay inspired by U.S. Chapter 11 (*Loi de sauvegarde des entreprises*). The aim of the reform was twofold. First, it allowed management to retain control over the bankruptcy proceedings. Second, it increased a debtor's ability to renegotiate its distress debt. Overall, the French reform led to a decrease in creditor rights (Weber, 2005). Finally, in an act similar to that of France, in 2005, Italy amended its 1942 Bankruptcy Code, prompted by Parmalat's collapse in 2003. The reform (Decree No. 35) introduced an array of provisions aimed at facilitating the renegotiability of outstanding debt and at protecting debtors. Since the reform, debtors have been allowed to start the reorganization phase without creditor consent. Thus, the reform decreased creditor rights (Rodano et al., 2016).

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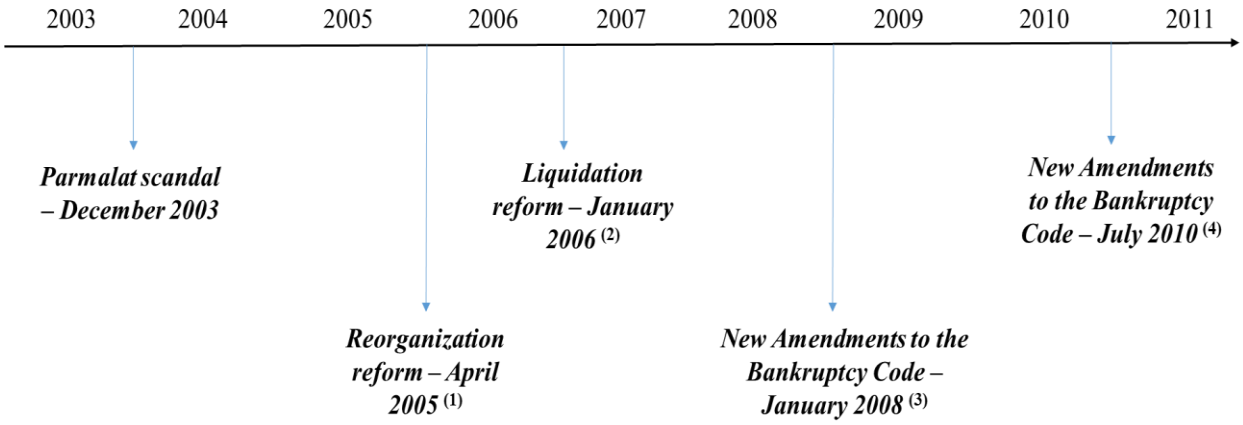
Figure A1. Timeline of the bankruptcy reform process in Italy, 2003–2011

This figure shows the timeline of the bankruptcy reform process in Italy over the period 2003–2011.



Notes:

(1) The Italian government presented the first draft of the reform to Parliament in December 2004, which was approved by Parliament in April 2005.

(2) Under the mandate of Parliament, the government modified several articles of the 1942 Bankruptcy Code related to the liquidation process. The final draft of the reform was approved by the government on December 22, 2005, and became law on January 9, 2006.

(3) The government approved new amendments to the 1942 Bankruptcy Code involving court supervision in debt restructuring plans. The final draft of the reform was approved on September 12, 2007, and became effective on January 1, 2008.

(4) On July 30, 2010, Parliament approved another comprehensive law addressing debt restructuring plans. The first draft was presented by the government on May 31, 2010.

Figure A2. Trends in tax enforcement in Italy, 2003–2011

This figure shows the trends in tax enforcement in Italy over the period 2003–2011. We proxy for tax enforcement with the average number of tax staff working at the central government tax agency for each of the four Italian economic regions (i.e., the northeast, northwest, central, and southern areas).

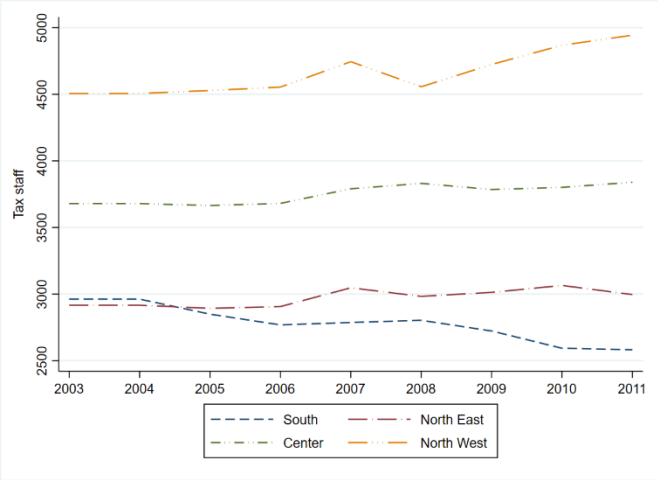
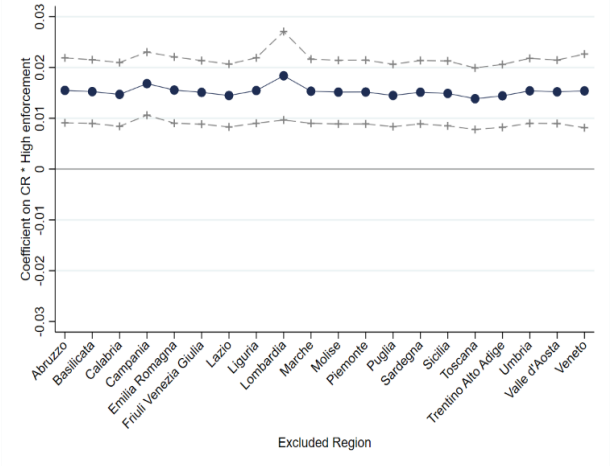


Figure A3. Creditor rights, lending, and tax avoidance: Excluding one region at a time, Italian setting

This figure shows the coefficients on *CR* × *High enforcement* from the regression in Eq. (2), excluding one region at a time. The dependent variables are *Book Leverage* (Panel A) and *GAAP ETR* (Panel B). The model specifications include firm and region–year fixed effects. The heteroskedasticity-robust standard errors are clustered at the appellate bankruptcy court level. The gray line represents the 95% confidence interval.

Panel A: Creditor Rights and Lending



Panel B: Creditor Rights and Tax Avoidance

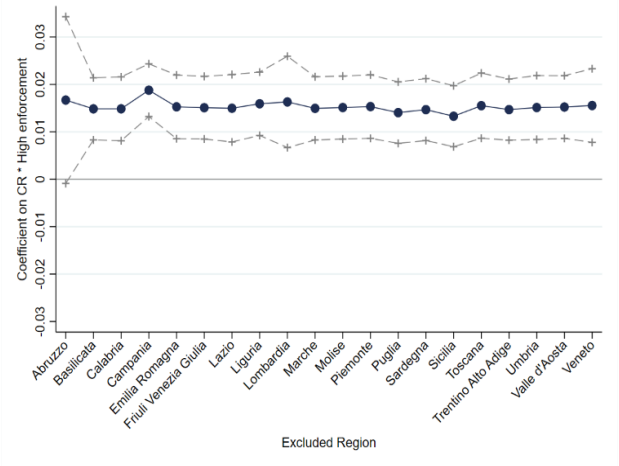
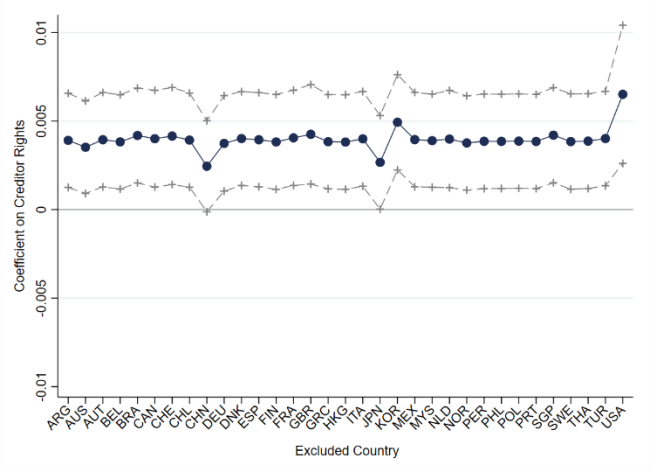


Figure A4. Creditor rights, lending, and tax avoidance: Excluding one country at a time, cross-country setting

This figure shows the coefficients on *CR* from the regression in Eq. (3), excluding one country at a time. The dependent variables are *Book Leverage* (Panel A) and *GAAP ETR* (Panel B). The model specifications include firm and industry–year fixed effects. The heteroskedasticity-robust standard errors are clustered at the country–industry level. The gray line represents the 95% confidence interval.

Panel A: Creditor Rights and Lending



Panel B: Creditor Rights and Tax Avoidance

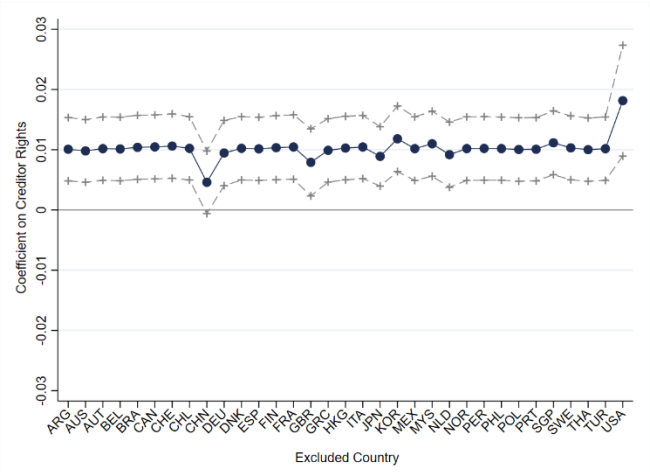


Table A1. Approval process of the bankruptcy reforms in Italy, 2003–2011

This table shows the approval process of the bankruptcy reforms in Italy over the period 2003–2011.

				Parliamentary debate											
				House of Representatives (630 members)						**Senate (315 members)**					
Year	Reform	Approved by the government under Parliament mandate	Approved by Parliament	No. of sessions	Valid votes	In favor	Against	Abstention	***Approval rate***	No. of sessions	Valid votes	In favor	Against	Abstention	***Approval rate***
2005	Decree No. 35 (transposed into Law No. 80/2005)	No	Yes	3	467	257	208	2	***55%***	6	278	165	112	1	***59%***
2006	Law. No. 5	Yes	No	-	-	-	-	-	-	-	-	-	-	-	-
2007	Decree 169	Yes	No	-	-	-	-	-	-	-	-	-	-	-	-
2010	Law No. 122	No	Yes	4	595	321	270	4	***54%***	10	306	170	136	0	***56%***

Table A2. Bankruptcy rate, length of bankruptcy proceedings, and socioeconomic conditions in Italy, 2003–2007

This table examines the association between socioeconomic conditions and the bankruptcy rate and the length of bankruptcy proceedings in Italy from 2003 to 2007. Panel A reports summary statistics for the main variables in the regression models. Panels B1 and B2 report the regression results from the following equation:

$$y_{k,t} = \alpha_0 + \beta_1 X_{k,t} + \varphi_l * \omega_t + \varepsilon_{k,t} \quad \text{(A1)}$$

where $y_{k,t}$ is, alternatively, *Bankruptcy rate per 10,000 firms* (Panel B1) or *Length of bankruptcy proceedings* (Panel B2) in province *k* and year *t*. The variable *Bankruptcy rate per 10,000 firms* is the number of firms filing for bankruptcy per 10,000 firms, from ISTAT. The variable *Length of bankruptcy proceedings* is the natural logarithm of D_t from the Italian Ministry of Justice and ISTAT. The vector $X_{k,t}$ includes local economic conditions (i.e., the GDP per capita), the characteristics of bankrupt firms (i.e., average bankruptcy fees and the natural logarithm of the average age of bankrupt firms), and social capital variables (i.e., human capital quality, female political participation, and recycling rate). The data are from ISTAT and the Sistema degli indicatori sociali regionali e provinciali. The model specifications include region–year or economic region–year fixed effects where indicated ($\varphi_l * \omega_t$). Economic regions are geographic dummies proxying for the northeast, northwest, central, and southern areas. Panels B1 and B2 report (in parentheses) heteroskedasticity-robust standard errors clustered at the province level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels (two tailed), respectively.

Panel A: Summary Statistics

Variables	Mean	Std. dev.	25th percentile	Median	75th percentile
Dependent variables					
Bankruptcy rate per 10,000 firms	0.0101	0.0044	0.0073	0.0098	0.0125
Length of bankruptcy proceedings	8.0858	0.6372	7.7072	8.0690	8.4282
Province-level variables					
GDP per capita	9.9964	0.2645	9.7351	10.0711	10.2091
Bankruptcy fees	0.2254	0.0828	0.1765	0.2255	0.2670
Age of bankrupt firms	4.7652	0.2237	4.6347	4.7707	4.8941
Human capital quality	0.0593	0.0138	0.0495	0.0590	0.0680
Female political participation	0.1632	0.0538	0.1240	0.1740	0.2030
Recycling rate	0.2363	0.1504	0.0970	0.2365	0.3495

Panel B1: Regression Analyses

	Bankruptcy rate per 10,000 firms					
	(1)	(2)	(3)	(4)	(5)	(6)
GDP per capita	-0.0050***	-0.0030*	0.0022	0.0024	-0.0008	-0.0006
	(0.0009)	(0.0017)	(0.0025)	(0.0030)	(0.0022)	(0.0025)
Bankruptcy fees		-0.0007		-0.0003		-0.0008
		(0.0026)		(0.0029)		(0.0027)
Age of bankrupt firms		-0.0004		0.0000		0.0005
		(0.0010)		(0.0010)		(0.0009)
Human capital quality		0.0043		-0.0142		0.0144
		(0.0163)		(0.0190)		(0.0168)
Female political participation		0.0004		0.0055		-0.0063
		(0.0078)		(0.0103)		(0.0077)
Recycling rate		-0.0052**		0.0015		-0.0028
		(0.0022)		(0.0028)		(0.0024)
Region–year fixed effects	No	No	Yes	Yes	No	No
Economic region–year fixed effects	No	No	No	No	Yes	Yes
Obs.	515	515	515	515	515	515
Adj. R^2	0.088	0.099	0.339	0.331	0.249	0.250

Panel B2: Regression Analyses

	Length of bankruptcy proceedings					
	(1)	(2)	(3)	(4)	(5)	(6)
GDP per capita	-0.9784***	-0.5803*	0.1054	0.2765	-0.4540	-0.2935
	(0.1785)	(0.3426)	(0.4316)	(0.4490)	(0.4194)	(0.4907)
Bankruptcy fees		0.5933		0.5164		0.5022
		(0.5627)		(0.5170)		(0.5613)
Age of bankrupt firms		0.0678		0.0146		0.0632
		(0.1195)		(0.1396)		(0.1209)
Human capital quality		1.0527		-0.9898		-0.7170
		(2.9932)		(3.3198)		(3.0952)
Female political participation		-0.6698		0.5992		-0.5680
		(1.1992)		(1.4190)		(1.2406)
Recycling rate		-0.7236		0.5637		-0.5131
		(0.4865)		(0.5973)		(0.5015)
Region–year fixed effects	No	No	Yes	Yes	No	No
Economic region–year fixed effects	No	No	No	No	Yes	Yes
Obs.	515	515	515	515	515	515
Adj. R^2	0.164	0.181	0.234	0.236	0.182	0.184

Table A3. Creditor rights, lending, and tax avoidance: Two-stage least squares regressions

This table examines the effect of creditor rights on lending and tax avoidance in Italy using two-stage least squares regressions. The dependent variables are *Book Leverage* and *GAAP ETR*. 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 zero otherwise. The model specifications include firm and region–year or economic region–year fixed effects. Economic regions are geographic dummies proxying for the northeast, northwest, central, and southern areas. 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 (two tailed), respectively. Appendix A provides the variable definitions.

	Book Leverage$_{t+1}$	**GAAP ETR$_{t+1}$**	**Book Leverage$_{t+1}$**	**GAAP ETR$_{t+1}$**
	(1)	(2)	(3)	(4)
CR × High enforcement	**0.0079***	**0.0117****	**0.0081***	**0.0112****
	(0.0048)	**(0.0054)**	**(0.0044)**	**(0.0050)**
GAAP ETR	0.0953***		0.0984***	
	(0.0107)		(0.0107)	
Book leverage		0.5691***		0.5686***
		(0.0099)		(0.0099)
Controls	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
Region–year fixed effects	Yes	Yes	No	No
Economic region–year fixed effects	No	No	Yes	Yes
Obs.	940,361	940,361	940,361	940,361
Adj. R^2	0.124	0.003	0.123	0.001

Table A4. Creditor rights and tax avoidance: Aggregate Italian tax returns

This table examines the effect of creditor rights on tax avoidance, using aggregate tax returns data from the Italian Ministry of Economy and Finance's website over the period 2004−2011. We estimate the following model at the region–year level:

$$y_{l,t+1} = \alpha_0 + \beta_1 CR_t \times High\ Enforcement\ (region)_{l,2003} + \beta_2 X_{l,t} + \varphi_l + \omega_t + \varepsilon_{l,t} \quad \text{(A2)}$$

where $y_{l,t+1}$ is the variable *Aggregate ETR* for region *l* and year *t* + 1. We compute *Aggregate ETR* as aggregate taxes paid divided by aggregate taxable income. The creditor rights indicator is *CR*. The variable *High enforcement (region)* denotes regions whose number of bankruptcy proceedings days is below the median of the distribution of bankruptcy proceedings days across the 20 Italian regions in 2003, and zero otherwise. In the analyses, we include a set of macroeconomic variables ($X_{l,t}$) from ISTAT, the Bank of Italy, and the Italian Ministry of Economy and Finance (i.e., the GDP per capita, regional tax rate, tax enforcement, and bank penetration) that are correlated with the development of financial markets. The model specifications include region (φ_l) and year (ω_t) fixed effects. The table reports (in parentheses) heteroskedasticity-robust standard errors clustered at the region level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels (two tailed), respectively.

	Aggregate ETR$_{t+1}$	
	(1)	(2)
CR* × *High enforcement (region)	**0.0135****	**0.0125****
	(0.0053)	**(0.0047)**
Regional GDP per capita		-0.0176
		(0.0294)
Regional tax rate		0.6333**
		(0.2341)
Regional tax enforcement		0.0230*
		(0.0116)
Regional bank penetration		-0.0430
		(0.6458)
Region fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
Obs.	160	160
Adj. R^2	0.981	0.983

Table A5. Determinants of creditor rights: Cross-country setting

This table examines the determinants of changes in creditor rights. The dependent variable is *CR*. The model specifications presented include country and year fixed effects. The table reports (in parentheses) heteroskedasticity-robust standard errors clustered at the country level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels (two tailed), respectively. Appendix B provides the variable definitions.

	Creditor rights index$_t$		
	(1)	(2)	(3)
Deductibility$_{t-1}$	0.0708	-0.0285	-0.0195
	(0.1767)	(0.1953)	(0.1924)
Corporate tax rate$_{t-1}$	2.5670	2.2567	2.0389
	(1.7945)	(1.5452)	(1.5069)
Dividend tax rate$_{t-1}$	0.1935	1.4823	1.5752
	(0.5656)	(0.9419)	(0.9390)
Shareholder rights$_{t-1}$	-0.0877	-0.0999	-0.0972
	(0.0786)	(0.0952)	(0.0889)
Rule of law$_{t-1}$	0.0203	-0.0260	-0.0803
	(0.4149)	(0.4345)	(0.4198)
Length of bankruptcy proceedings$_{t-1}$	0.0710	0.1127	0.1284
	(0.0830)	(0.0962)	(0.0981)
GDP per capita$_{t-1}$	0.4616	0.8668	0.5246
	(0.5529)	(1.4162)	(1.2407)
Deductibility$_{t-2}$		0.1247	0.1624
		(0.1254)	(0.2235)
Corporate tax$_{t-2}$		0.7802	0.1716
		(1.2428)	(0.9319)
Dividend tax$_{t-2}$		-1.6844	-0.3855
		(1.0294)	(0.4007)
Shareholder rights$_{t-2}$		0.0430	0.0569
		(0.0825)	(0.1018)
Rule of law$_{t-2}$		0.0844	0.0949
		(0.1537)	(0.4714)
Length of bankruptcy proceedings$_{t-2}$		-0.0424	-0.0167
		(0.0251)	(0.0307)
GDP per capita$_{t-2}$		-0.4220	1.3957
		(1.1999)	(1.0490)
Deductibility$_{t-3}$			-0.0260
			(0.1981)
Corporate tax$_{t-3}$			0.8324
			(1.3577)
Dividend tax$_{t-3}$			-0.5786
			(0.8909)
Shareholder rights$_{t-3}$			-0.0231
			(0.0659)
Rule of law$_{t-3}$			-0.1411
			(0.3063)
Length of bankruptcy proceedings$_{t-3}$			-0.0552*
			(0.0297)
GDP per capita$_{t-3}$			-1.5656
			(1.0348)
Country fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
Obs.	330	330	330
Adj. R^2	0.846	0.847	0.845

Table A6. Creditor rights, lending, and tax avoidance: Robustness tests, cross-country setting

This table examines the effect of creditor rights on lending and tax avoidance across countries. In Panel A, the dependent variables are *Net Book Leverage*, *Market Leverage*, *Debt Issuance*, *CASH ETR*, *Tax Avoid1*, and *Tax Avoid3*. The variable *Net Book Leverage* is total debt minus cash and short-term investments (*DLC* + *DLTT* − *CHE*) relative to total assets (*AT*); *Market Leverage* is total debt (*DLC* + *DLTT*) relative to total debt plus market capitalization (*DLC* + *DLTT* + *MKT CAP*); and *Debt Issuance* is long-term debt issuance less long-term debt reduction (*DLTIS* − *DLTR*) relative to lagged total assets (*AT*). We replace the numerator with the sum of changes in long-term debt and in short-term debt (*ΔDLTT* + *ΔDLC*) if either long-term debt issuance or long-term debt reduction is missing. The variable *CASH ETR* is income taxes paid (*TXPD*) divided by pretax income minus special items (*PI* − *SPI*), and *Tax Avoid1* is pretax income (*PI*) times the corporate tax rate (*Corporate tax*) minus income taxes (*TXT*), relative to total assets (*AT*)., The variable is multiplied by −1. The variable *Tax Avoid3* is the three-year sum of pretax income minus special items (*PI* − *SPI*) times the corporate tax rate (*Corporate tax*) minus current taxes paid (*TXC* − Δ*TXP*), relative to the three-year sum of pretax income minus special items (*PI* − *SPI*). The three years cover from year *t* − 2 to year *t*, and the variable is multiplied by −1. In Panel B, 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 and country trends where indicated. 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 (two tailed), respectively. Appendix B provides the variable definitions.

Panel A: Alternative Dependent Variables

	Net Book Leverage$_{t+1}$	**Market Leverage$_{t+1}$**	**Debt Issuance$_{t+1}$**	**CASH ETR$_{t+1}$**	**Tax Avoid1$_{t+1}$**	**Tax Avoid3$_{t+1}$**
	(1)	(2)	(3)	(4)	(5)	(6)
CR	0.0038**	0.0185***	0.0042***	0.0089***	0.0010**	0.0116***
	(0.0017)	(0.0029)	(0.0016)	(0.0027)	(0.0005)	(0.0035)
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
Obs.	65,187	65,026	65,187	38,957	65,187	51,498
Adj. R^2	0.849	0.814	0.140	0.495	0.286	0.600

Panel B: Additional Analyses

	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	0.0029**	0.0103***	0.0035**	0.0108*	0.0130*	0.0276*
	(0.0013)	(0.0028)	(0.0017)	(0.0061)	(0.0078)	(0.0159)
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
Country trends	Yes	Yes	No	No	No	No
Clustering by country-year and firm	No	No	Yes	Yes	No	No
Exclude financial crisis	No	No	No	No	Yes	Yes
Obs.	65,187	65,187	65,187	65,187	31,148	31,148
Adj. R^2	0.813	0.286	0.813	0.285	0.873	0.474

Table A7. Rules of the deductibility index: Cross-country setting

This table summarizes the data for our deductibility index across the 33 countries from 2004 to 2013. Each country–year observation is from the KPMG and E&Y Corporate Tax Guides, as well as from Bethmann et al. (2018) and Alexander et al. (2020).

Country	Allowances for corporate equity	Thin capitalization rules	Tax loss carryback	Tax loss carryforward
Argentina		From 2004 on		5 years from 2004 on
Australia		From 2004 on	From 2012 on	Unlimited years from 2004 on
Austria	2004	From 2004 on		Unlimited years from 2004 on
Belgium	From 2006 on	From 2004 on		Unlimited years from 2004 on
Brazil		From 2010 on		Unlimited years from 2004 on
Canada		From 2004 on	From 2004 on	7 years from 2004 to 2005, 10 years in 2006, 20 years from 2007 on
Chile		From 2004 on	From 2004 on	Unlimited years from 2004 on
China		From 2004 on		5 years from 2004 on
Denmark		From 2004 on		Unlimited years from 2004 on
Finland				10 years from 2004 on
France		From 2004 on	From 2004 on	Unlimited years from 2004 on
Germany		From 2004 on	From 2004 on	Unlimited years from 2004 on
Greece		From 2009 on		5 years from 2004 on
Hong Kong				Unlimited years from 2004 on
Italy	From 2011 on	From 2005 on		5 years from 2004 to 2011, unlimited years from 2012 on
Japan		From 2004 on	From 2009 on	5 years in 2004, 7 years from 2005 to 2011, 9 years from 2012 on
Korea			2004, from 2006 on	5 years from 2004 to 2009, 10 years from 2010 on
Malaysia			From 2009 to 2010	Unlimited years from 2004 on
Mexico		From 2005 on		10 years from 2004 on
Netherlands		From 2004 on	From 2004 on	Unlimited years from 2004 to 2006, 9 years from 2007 on
Norway			From 2008 to 2009	10 years from 2004 to 2005, unlimited years from 2006 on
Peru		From 2004 on		4 years in 2004, unlimited years from 2005 on
Philippines				3 years from 2004 on

Poland	From 2004 on		5 years from 2004 on
Portugal	From 2004 on		6 years from 2004 to 2010, 4 years from 2011 to 2012, 5 years from 2013 on
Singapore		From 2006 on	Unlimited years from 2004 on
Spain	From 2004 on		15 years from 2004 to 2011, 18 years from 2012 on
Sweden			Unlimited years from 2004 on
Switzerland	From 2004 on		7 years from 2004 on
Thailand			5 years from 2004 on
Turkey	From 2004 on		5 years from 2004 on
United Kingdom	From 2004 on	From 2004 on	Unlimited years from 2004 on
United States	From 2004 on	From 2004 on	20 years from 2004 on