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## Taxation and debt maturity: Empirical evidence from a quasi-experiment in China



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### ABSTRACT

We take advantage of China's new *Corporate Income Tax Law* and use a difference-in-differences approach to determine whether foreign investment enterprises (FIEs) responded to the law by shortening debt maturity. Employing the Chinese Industrial Enterprises Database from 2007 to 2008 to implement the analysis, we find that FIEs have responded to the law by shortening debt maturity; the treatment effect is more negative for Hong Kong-Macau-Taiwan (HMT) investment enterprises than for other FIEs; and the treatment effect by restricting the control group to Private-Owned Enterprises (POEs) is more negative than that by restricting the control group to State-Owned Enterprises (SOEs). All three findings are consistent with the tax-based theories of debt maturity, and hence we conclude that taxation plays an important role in the choice of debt maturity. We argue that our conclusion is not China-specific, but a general lesson for modern finance theory and is portable to developed countries.

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## 1. Introduction

Modigliani and Miller (1958) imply that the choice of debt maturity is irrelevant in a perfect and frictionless world. Stiglitz (1974) formally establishes the irrelevance of debt maturity in perfect markets by extending the contribution of Modigliani and Miller (1958). His conclusion is that, under a fairly general set of conditions (absence of taxation, transaction costs, bankruptcy costs, and other

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frictions), the choice of debt maturity does not matter. Intuitively, the assumption of a perfect and frictionless capital market implies that financial innovation would quickly extinguish any deviation from their predicted equilibrium.

Since their seminal contribution, the theory of optimal debt maturity has been rapidly developed by financial researchers, much of which focused on the consequences of relaxing the assumption of a perfect and frictionless capital market (e.g., Myers, 1977; Kane et al., 1985; Diamond, 1991; and Hart and Moore, 1994). One of the leading theories of debt maturity is the tax-based theory (Kane et al., 1985), which says that optimal debt maturity results from a trade-off between the corporate tax benefit of debt against the bankruptcy and flotation costs of debt. It predicts that a firm's debt maturity decreases as its effective tax rate increases.

Whether and to what extent taxation affects the choice of debt maturity is an important topic for both academic researchers and policymakers, as is evident in the recent policy debate in the U.S. Some empirical studies have been done to investigate the impact of taxation on the choice of debt maturity. The contributions include Barclay and Smith (1995), Stohs and Mauer (1996), Newberry and Novack (1999), Harwood and Manzon (2000), Ozkan (2002), and Fan et al. (2012). We do not find any empirical studies that document the characteristics of Chinese companies in terms of debt maturity.

Typically, the papers in this literature employ a cross-sectional approach to check the correlation between an enterprise's debt maturity and its tax attributes. However, the cross-sectional approach might be inappropriate to study the impact of taxation on the choice of debt maturity because it is difficult to make causal inferences, which results in two consequences. First, it is basically impossible to interpret their results. Second, not surprisingly, their findings on the correlation between an enterprise's debt maturity and its tax attributes are mixed (Graham, 2003). For example, on one hand, Stohs and Mauer (1996) find that debt maturity decreases with corporate tax rate, which is consistent with the prediction of Kane et al. (1985). But on the other hand, both Newberry and Novack (1999) and Harwood and Manzon (2000) find a positive correlation between debt maturity and corporate tax rate, which opposes the prediction of Kane et al. (1985). Therefore, whether and to what extent taxation affects the choice of debt maturity is still an unsettled topic, and thus absolutely deserves further studies.

In order to overcome the above problem associated with the cross-sectional approach, a natural idea is thus to look for exogenous changes in tax laws, and then check how enterprises respond to the changes in tax laws by adjusting debt maturity. Methodologically, this approach represents an improvement over the cross-sectional approach employed in previous studies. Our study makes an attempt in this direction.

China's new *Corporate Income Tax Law* was passed in March 2007 and took effect on January 1, 2008. It terminated the dual corporate income tax regime by removing the preferential tax treatments offered to foreign investment enterprises (FIEs) by the Chinese government and unifying the corporate income tax regime for FIEs and Chinese domestic enterprises (DEs). It was widely expected that the law would have substantial impact on FIEs, but little, if any, impact on DEs. In this study, we use a difference-in-differences approach to determine whether FIEs responded to the law by shortening debt maturity. Our treatment group is made up of FIEs affected by the law, whereas our control group is made up of DEs unaffected by the law. We employ the Chinese Industrial Enterprises Database from 2007 to 2008 to implement the analysis. The results of our data analysis suggest three findings. First, FIEs seem to have responded to the law by shortening debt maturity. Second, the treatment effect is more negative for Hong Kong-Macau-Taiwan (HMT) investment enterprises than for other FIEs, which implies that HMT investment enterprises are more sensitive and more responsive to the removal of the preferential tax treatments than other FIEs. This finding is compatible with the impression that family-controlled enterprises are more prevalent among HMT investment enterprises than among other FIEs (Fan et al., 2011). Because the ownership of family-controlled enterprises is typically highly concentrated, HMT investment enterprises tend to be more sensitive and more responsive to the removal of the preferential tax treatments than other FIEs. Finally, the treatment effect by restricting the control group to Private-Owned Enterprises (POEs) is more negative than that by restricting the control group to State-Owned Enterprises (SOEs), which is consistent with the perception that SOEs might enjoy more favorable treatments from the Chinese government than POEs. All three findings are

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