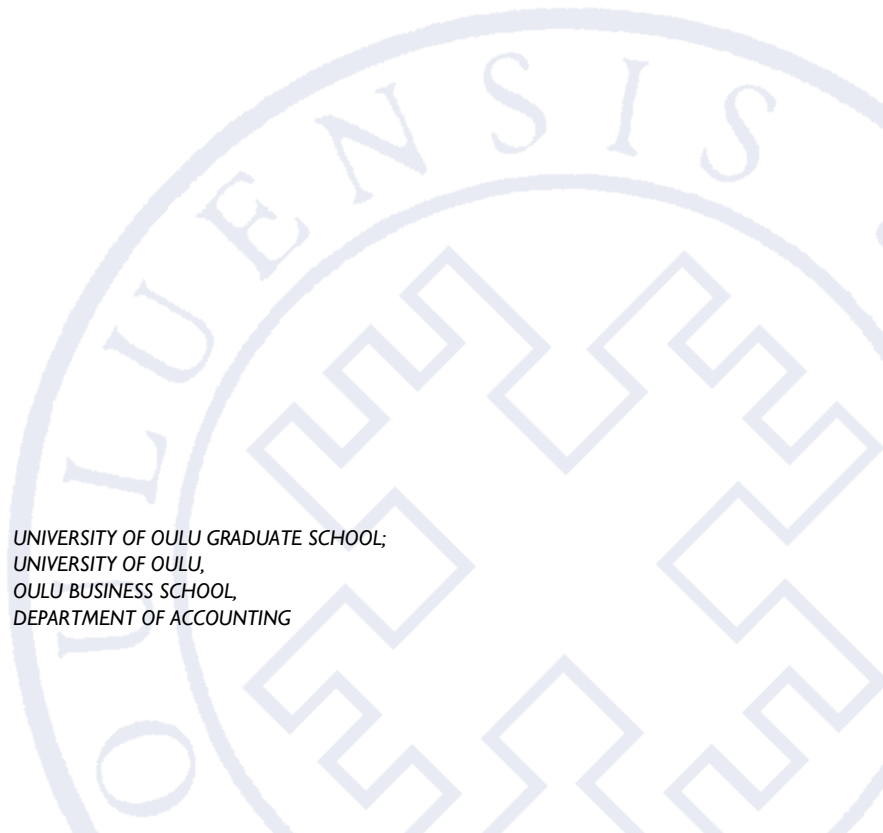


*Irene Tan*

ESSAYS ON THE EFFECTS  
OF INVESTOR PROTECTION  
AND FINANCIAL STRUCTURE  
ON FIRM DECISIONS AND  
OUTCOMES

UNIVERSITY OF OULU GRADUATE SCHOOL;  
UNIVERSITY OF OULU,  
OULU BUSINESS SCHOOL,  
DEPARTMENT OF ACCOUNTING

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*IRENE TAN*

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**Tan, Irene, Essays on the effects of investor protection and financial structure on firm decisions and outcomes.**

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***Abstract***

The laws and financial structure of a country can affect firm decisions and outcomes by affecting financial constraints and agency problems. Power theories of credit suggest that the legal rights of creditors, such as the ability to grab collateral in bankruptcy, increase the willingness of lenders to extend credit. Shareholder protection can reduce information asymmetry and agency problems by mandating quality disclosures, stipulating approval procedures for potentially conflicted transactions and facilitating the private litigation process. The bank-based financial structure can reduce moral hazard by alleviating the free-rider problem in monitoring.

This dissertation contains various novel results. The first essay presents evidence of an inverse relation between creditor rights and the value of cash. This is consistent with financial constraints increasing the marginal value of cash, and creditor rights alleviating financial constraints. The second essay suggests that the bank-based financial structure improves the operating performance of large investments especially for diffusely held firms, consistent with the less prevalent free-rider problem in monitoring. The third essay shows that shareholder protection raises investment hazard for the smallest firms. This is consistent with the notion that shareholder protection alleviates those asymmetric information-related problems that delay investment, such as cash flow diversion by corporate insiders.

In addition to contributing to the scientific literature, the results of this dissertation can have practical implications for companies, suppliers of finance and policymakers. A value-maximizing company should take into account its legal environment when deciding on cash holdings. Suppliers of finance should consider the interplay between financial structure and ownership structure when evaluating the profitability of investments. Policymakers often encourage investments due to their effect on employment and tax income. The results of this dissertation show that investor protection increases the frequency of large investments and their profitability.

***Keywords:*** financial structure, firm performance, investment timing, investor protection, value of cash



## **Tan, Irene, Esseitä sijoittajansuojan ja rahoitusrakenteen vaikutuksista yrityksen päätöksentekoon ja suorituskykyyn.**

Oulun yliopiston tutkijakoulu; Oulun yliopisto, Oulun yliopiston kauppakorkeakoulu, Laskentatoimen yksikkö

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### ***Tiivistelmä***

Maan lait ja rahoitusrakenne voivat vaikuttaa yrityksen päätöksentekoon rahoitusrajoitteiden ja agenttiongelmien kautta. Velkojien vaikutusvaltaan perustuvien teorioiden mukaan velkojan oikeudet, kuten oikeus vakuuteen konkurssin yhteydessä, lisäävät velanantajan lainaamishalukkuutta. Osakkeenomistajia suojaavat lait voivat puolestaan vähentää yrityksen ja sijoittajien välistä epäsymmetristä informaatiota ja agenttiongelmia esimerkiksi vaatimalla laadukkaita ilmoituksia ja hyväksymisprosesseja koskien potentiaalisesti eturistiriitoja sisältäviä transaktioita sekä mahdollistamalla yksityisen kanteen nostamisen. Lisäksi maan pankkiperusteinen rahoitusrakenne voi vähentää moraalikatoa lievittämällä vapaamatkustajaongelmaa yritysjohdon monitoroinnissa.

Tämä tutkielma sisältää useita uusia tuloksia. Ensimmäisessä esseessä havaitaan käänteinen yhteys velkojien oikeuksien ja kassan arvon välillä. Johdonmukainen selitys tälle havainnolle on, että rahoitusrajoitteet lisäävät kassan marginaaliarvoa ja velkojien oikeudet lieventävät rahoitusrajoitteita. Toisen esseen tulosten mukaan pankkiperusteinen rahoitusrakenne parantaa suurten investointien vaikutusta operatiiviseen tulokseen erityisesti hajaantuneen omistusrakenteen omaavien yritysten osalta. Tämä voi johtua pankkiperusteisen rahoitusjärjestelmän vapaamatkustajaongelmaa vähentävästä vaikutuksesta. Kolmannen esseen tulosten mukaan osakkeenomistajansuoja kohottaa suurten investointien hasardifunktiota pienimpien yritysten osalta. Tämä puolestaan voi johtua siitä, että osakkeenomistajansuoja lievittää investointeja hidastavia epäsymmetrisen informaation ongelmia, kuten yrityksen sisäpiiriläisten mahdollista taipumusta ohjata yrityksen kassavirtoja heitä itseään hyödyttäviin kohteisiin.

Tieteellisen kontribuution lisäksi tutkimustuloksia voidaan hyödyntää yritysten, rahoittajien ja poliitikkojen päätöksenteossa. Yrityksen arvoa maksimoivan johtajan tulisi kassan suuruutta päättäessään ottaa huomioon maassa vallitseva lakiympäristö. Rahoittajien tulisi puolestaan huomioida maan rahoitusrakenteen ja yrityksen omistusrakenteen vaikutus investointien kannattavuuteen. Poliitikkojen yleinen tavoite on lisätä yritysten investointeja, koska ne parantavat työllisyyttä ja synnyttävät verotuloja. Tämän tutkielman mukaan sijoittajansuoja lisää suurten investointien frekvenssiä ja kannattavuutta.

*Asiasanat:* investointien ajoitus, kassan arvo, rahoitusrakenne, sijoittajansuoja, yrityksen suorituskyky





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March 2018

Irene Tan



## Original publications

This thesis is based on the following publications, which are referred throughout the text by their Roman numerals:

- I Kyröläinen, P., Tan, I., & Karjalainen, P. (2013). How creditor rights affect the value of cash: A cross-country study. *Journal of Corporate Finance*, 22, 278-298. <https://doi.org/10.1016/j.jcorpfin.2013.06.001>
- II Kyröläinen, P., & Tan, I. (2018). *International evidence on the operating performance of large capital investments in different financial systems*. Manuscript.
- III Tan, I. (2017). *How does investor protection affect investment timing? Cross-country evidence using a hazard model*. Manuscript.



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# 1 Introduction

## 1.1 Background

In a frictionless economy, firms can raise external finance when required, and managers make investment decisions that maximize the value of the firm (i.e., managers implement the first-best investment policy). A setting of a frictionless economy establishes a benchmark for studying the effects of frictions, such as financial constraints and agency problems, on corporate decisions and outcomes. Financial constraints mean that a firm faces costly external finance, which prevents the firm from implementing its first-best investment policy (Almeida, Campello, & Weisbach, 2011). Economic theory suggests two main explanations for financial constraints. First, power theories of credit propose that when lenders have the right to be paid ahead of other creditors, seize collateral or take control of the firm, they are more willing to extend credit (Djankov, McLiesh, & Shleifer, 2007). These powers increase creditor recovery rates in bad economic situations, such as bankruptcy. Second, theories based on asymmetric information suggest that security issuance may be subject to a similar lemons problem as the one originally analyzed by Akerlof (1970) in the context of the market for used cars. A lemon in the context of security issuance can be viewed as a company with an unprofitable investment opportunity. The problem under asymmetric information is that it can be difficult for outside investors to separate lemons from firms with valuable investment opportunities, which increases the cost of external finance for good firms and thus makes them less willing to raise external finance to fund investments. Therefore, asymmetric information can cause good firms to bypass investments that would have been value-increasing under symmetric information (Myers & Majluf, 1984). However, companies may overcome the adverse selection problem by credibly signaling their quality. Examples of various signaling devices proposed in the economic literature are dividends (Bhattacharya, 1979), net payout (Miller & Rock, 1985) and debt (Ross, 1977). In a more recent study, Morellec and Schürhoff (2011) propose that firms can signal using investment timing.

Agency problems between a manager (agent) and outside investors (principals) occur when the manager makes decisions that are not in the interest of investors but increase the manager's private benefits (Jensen & Meckling, 1976). Consider the case where the owners of a company delegate investment decisions to a manager. Conflicts of interests arise when the manager derives utility not only from the value

of the investment project but also from private benefits, such as personal consumption from diverted project value. A combination of incomplete or asymmetric information, and conflicts of interest, can result in the manager making inefficient investment decisions. This is due to the difficulty of monitoring the manager under imperfect information.

Investment distortions caused by financial constraints and agency problems can take various forms. For example, the manager may invest on too large a scale (the overinvestment problem) or on a too small scale (the underinvestment problem). Our empirical tests are also motivated by theories which propose that the manager may make inefficient investment project choices by choosing investment projects that are privately more beneficial than more profitable alternative projects (Boot & Thakor, 1997). In addition, the manager can distort the timing of investment to cover value diversion from outsiders or to ease adverse selection (Grenadier & Malenko, 2011; Morellec & Schürhoff, 2011).

The motivation for studying the effect of investor protection on corporate policies and outcomes is that investor protection can be related to financial constraints and agency problems. In this dissertation, investor protection refers to the laws of a country that protect shareholders and creditors. The seminal papers of La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1997, 1998) fostered a rapidly growing body of literature on large-scale cross-country investor protection research. Their major contribution was to identify the commercial laws, primarily corporate and bankruptcy laws, of many countries and code these laws into measures representing protection of shareholders and creditors. These measures were refined and new measures introduced in later studies (Djankov, La Porta, Lopez-de-Silanes, & Shleifer, 2008; Djankov et al., 2007; La Porta, Lopez-de-Silanes, & Shleifer, 2006). The newer measures were designed to be better grounded in theory and were found to be more robust predictors of economic outcomes. The shareholder rights measures recognize disclosures as a tool for outside investors to monitor investment opportunities and potential expropriation by corporate insiders. In addition, they include approval procedures of potentially conflicted transactions and liability standards concerning recovery of damages, which can make expropriation more difficult and costly. Creditor rights measure the powers given by the law to creditors in bankruptcy. These powers include the ability to easily grab collateral, the absolute priority to the proceeds of liquidated assets of the company, and the right to gain control of the firm and replace incumbent management in default.



Countries can also be distinguished by their financial structure. The financial structure of a country refers to the extent to which banks or financial markets dominate its financial system (Levine, 2002). In a bank-based financial structure, financial intermediaries are relatively dominant providers of financing, whereas in a market-based system, financing is often directly raised from a large number of small investors. The advantages and disadvantages of a bank-based financial system in comparison with market-based systems have stirred lively policy debate for over a century (Allen & Gale, 2000; Demirgüç-Kunt & Levine, 2001). Early research on the effects of the structure of financial systems on corporate policies comprised single-country studies. Studies compared corporate decision making in prototype bank-based countries, such as Japan or Germany, to that in the U.S., the archetype of a market-based country (Allen & Gale, 1995; Hoshi, Kashyap, & Scharfstein, 1990; Hoshi, Kashyap, & Scharfstein, 1991). Beck, Demirgüç-Kunt and Levine (2001) constructed a financial structure database containing indicators on the size, activity and efficiency of financial intermediaries and markets for a broad cross-section of countries over time. This financial structure database facilitated the undertaking of larger-scale and more comprehensive cross-country studies (e.g., Beck & Levine, 2002; Levine, 2002).

Our motivation for studying the effect of financial structure on investment efficiency is that financial structure can be related to agency problems. A potential solution to agency problems is that principals monitor agents' actions. However, in a setting of multiple principals, monitoring is beset by the free-rider problem. In the context of an investment decision, one of the central arguments for a bank-based financial system is that financial intermediaries can monitor managers more effectively than markets since they are less subject to the free-rider problem in which no one monitors (Boot & Thakor, 1997; Diamond, 1984). On the other hand, a market-based system can have its own benefits, such as information feedback from order flows to corporate decisions, a more effective hostile takeover market and better firm-level corporate governance (Anderson & Gupta, 2009; Boot & Thakor, 1997; Köke, 2004).

## **1.2 Purpose of the dissertation**

The purpose of this dissertation is to analyze the effect of country characteristics on firm policies and outcomes. Three empirical essays seek to answer the following main research questions: How do creditor rights affect the value of corporate cash holdings? How does financial structure affect the operating performance of large

investments? How does investor protection affect investment timing? These research questions represent the core focus of the essays and are not intended to be an exhaustive list of research questions examined in this dissertation. In the next section and the review section of the essays, the contribution of each essay is elucidated in more detail.

### **1.3 Contribution and structure of the dissertation**

This dissertation contributes to the investor protection and financial structure literature in several ways. The first essay contributes to the growing literature that examines how differences in creditor rights across countries influence firm policies and outcomes (e.g., Acharya, Amihud, & Litov, 2011; Brockman & Unlu, 2009; Ferreira & Vilela, 2004; Seifert & Gonenc, 2016). Earlier international cash valuation literature has studied the effect of country-level shareholder protection on cash valuation but has ignored the role of creditor rights (Pinkowitz, Stulz, & Williamson, 2006). We extend this literature by empirically testing how laws protecting creditors affect the marginal value of cash. We also contribute by showing how the effect of creditor rights on the marginal value of cash compares to the effect of shareholder rights. We argue that creditor rights are inversely related to financial constraints. Therefore, we also contribute to the literature that studies the role of financial constraints in cash valuation. Earlier studies in this research area have focused on firms from a single country (the U.S.) and used only firm-level proxies for financial constraints, whereas we consider country-level determinants of financial constraints (Denis & Sibilkov, 2010; Faulkender & Wang, 2006). We complement the cash valuation analysis by examining the relation between creditor rights and the marginal value of investment since the major use of cash can be the financing of investments.

The second essay contributes to the literature on the effects of financial structure on economic outcomes. Earlier empirical studies have tested the effect of financial structure on macroeconomic growth and investment (Levine, 2002), industry-level economic performance (Beck & Levine, 2002), financial constraints (Baum, Schäfer, & Talavera, 2011; Demirgüç-Kunt & Maksimovic, 2002), performance of R&D investment (Booth, Junttila, Kallunki, Rahiala, & Sahlström, 2006; Karjalainen, 2008), and firm-level corporate governance and valuation (Anderson & Gupta, 2009). We contribute to this literature by examining the relation between financial structure and the operating performance of large capital investments. Using data from a single country (the U.S.), Billett, Garfinkel, and

Jiang (2011) find that large capital investments substantially decrease the future performance of poorly governed firms. However, the role of country-level factors on the performance of large investment has not previously been studied. We consider the monitoring role of banks as a specific channel through which a bank-based financial system can improve the investment performance of firms owned by many small shareholders. In addition, we look at the effect of financial development on the performance of large investments, since earlier literature has found it to be related to economic growth. Finally, we consider the effect of laws on investment efficiency.

The third essay contributes to the investor protection and corporate investment literature by examining the effect of investor protection on the timing of large investments using a hazard modelling approach. Theoretical models clearly distinguish the investment timing decision from the capital allocation decision (Grenadier & Wang, 2005; Whited, 2006). Earlier single-country (U.S.) studies have empirically analyzed the effect of firm-level proxies of financial constraints and corporate governance on investment timing (Billett, Garfinkel, & Jiang, 2011; Whited, 2006). In contrast, cross-country investment literature has focused on the effect of investor protection on the capital allocation decision (e.g., Brown, Martinsson, & Petersen, 2013; McLean, Zhang, & Zhao, 2012; Qi, Roth, & Wald, 2017; Seifert & Gonenc, 2012). In addition, we contribute by analyzing whether asymmetric information can explain the investment timing effects of investor protection.

The rest of the thesis is structured as follows. Section 2.1 describes the theoretical model of the relation between cash and firm value, which provides the underlying theoretical framework for the first essay. Section 2.2 describes the theoretical models of financial intermediation and project selection, which serve as the theoretical background for the second essay. Section 2.3 outlines the theoretical models of investment timing that underpin the third essay. Section 3 reviews the empirical essays. Finally, the original essays are presented at the end of the thesis.



## 2 Theories

### 2.1 Creditor protection and marginal value of cash

In a frictionless economy, characterized by perfect capital markets and the absence of agency problems, a firm's cash holdings decision is irrelevant for firm value in the sense that each extra dollar of cash increases firm value by one dollar. The central assumptions underlying this proposition are the absence of costs associated with raising external financing and the absence of agency problems relating to the usage of cash holdings. However, in a more realistic setting, the availability of external financing can be constrained, and corporate insiders may be subject to moral hazard.

In the presence of finance constraints, the key benefit of cash holdings is that they allow a firm to avoid incurring costs associated with raising external finance if it needs cash, for example, for financing profitable investments. Therefore, the marginal value of cash should increase with financial constraints. This perspective is the dark side of finance constraints where finance constraints can lead to underinvestment because of costly and limited external financing. Moreover, in the presence of financial constraints, the marginal value of cash can be higher than \$1 for firms needing external financing. We illustrate these value implications with an example adapted from Faulkender and Wang (2006). Assume there are two firms, Firm A and Firm B, that need to raise finance for a value-increasing investment project and have low cash holdings. The two firms are identical except that Firm A holds one additional dollar of cash. Thus, Firm B needs to raise one more dollar of cash than Firm A. This will cost Firm B an additional  $(1/1-f)$ , where  $f$  is a premium incurred when raising external finance. The firms should raise finance until the marginal value of cash equals the marginal cost of cash, that is until the marginal value of cash reaches  $(1/1-f)$ .

Faulkender and Wang (2006) argue that agency costs arising from the free cash flow problem identified by Jensen (1986) are prevalent for firms with excess cash reserves. Agency problems generate costs to holding excess cash. Therefore, the marginal value of cash should decrease in the presence of agency problems. Moreover, when agency costs dominate the benefits of cash holdings, the marginal value of cash should be less than \$1. The bright side of financial constraints is that they can reduce agency problems related to cash usage especially if firms tend to overinvest (Billett et al., 2011; Luo, 2011). This is another argument for a higher

marginal value of cash for constrained firms, and a negative relation between creditor protection and the marginal value of cash. The argument is consistent with the notion that the market believes more in financial constraints than in the direct incentive effects of creditor rights in reducing inefficient cash usage. A possible explanation for such beliefs is that when loans are strongly secured, creditors supply financing too easily. In addition, strong creditor rights can reduce creditors' incentives to monitor corporate managers.

Economic theory proposes that the power of creditors can be an important determinant of the cost of external finance (Djankov et al., 2007). The power of creditors arises from rights associated with debt contracts. The first essay focuses on the rights afforded to creditors by the laws of a country. Theories of debt based on incomplete contracts and the transfer of control rights upon default, imply that if creditors have, for example, the right to gain control of the firm or repossess collateral in the event of default, then creditors are more powerful than they would be without these rights (Aghion & Bolton, 1992; Hart & Moore, 1998). Djankov, McLiesh, and Shleifer (2007) and Qian and Strahan (2007) find evidence that when creditors have more powers, they are more willing to extend credit. Therefore, strong creditor protection can decrease the marginal value of cash by decreasing  $f$ , the premium required by creditors, *ceteris paribus*. Recent dynamic models with frictions produce a similar implication for the value of cash (Bolton, Chen, & Wang, 2011; Décamps, Mariotti, Rochet, & Villeneuve, 2011).

## **2.2 Financial structure and efficiency of investment**

Boot and Thakor (1997) formally analyze the efficient capital allocation problem under incomplete information<sup>1</sup> and moral hazard. In the absence of effective monitoring, corporate managers may choose a bad project that is characterized by low payoffs but is privately more beneficial than a good project with high payoffs. This means that managers may choose investment projects based on their private benefits as opposed to contractible payoffs. The financial market, consisting of atomistic traders (each of measure zero), is ineffective in deterring firms from investing in a bad project since market participants face a coordination failure in monitoring. Since each trader is small, a certain mass of traders must monitor for

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<sup>1</sup> This model is an example of a game of incomplete information since nature moves first to decide whether the firm is in a low flexibility state or a high flexibility state. High flexibility firms have a choice between good and bad projects, whereas low flexibility firms always invest in the good project.

monitoring to be effective. Therefore, each trader must incur the monitoring costs, but the benefits accrue to all traders. This public good-like property of monitoring outcomes implies that markets can suffer from a free-rider problem in which no one monitors. The bank-based financial system, in contrast, is characterized by a coalition of monitoring agents in the form of a financial intermediary. These monitoring agents can coordinate their monitoring efforts since they can observe one another's actions costlessly. The coordination in monitoring resolves the free-rider problem in a bank-based system. Effective monitoring in turn forces firms to make an efficient investment project choice. On the other hand, larger investors can alleviate the free-rider problem since they suffer less from the coordination problem in monitoring. Therefore, the benefits of a bank-based system relative to a market-based system should be largest when the ownership structure is diffuse.

The free-rider problem in monitoring and the role of banks as effective monitors also arise in Diamond (1984), since each monitoring agent should duplicate the costs in monitoring. The main difference between Boot and Thakor (1997) and Diamond (1984) is that in the former, the banks monitor *ex ante* project choices, whereas in the latter, the banks monitor *ex post* cash flows. In addition, the underlying assumption of various theoretical models is that a bank monitors the moral hazard problem relating to an investment project choice more effectively than the market consisting of atomistic traders (Chakraborty & Ray, 2006; Holmström & Tirole, 1997).

In Boot and Thakor (1997), the advantage of the financial market over a bank is the information feedback from the demand for securities to the real investment decision of a firm. This follows from the assumption that the market has information on a firm's investment opportunities, which is not directly known by the firm itself. This means that corporate insiders can utilize the information contained in the demand for their securities to make more efficient investment decisions. More empirically motivated arguments for a market-based system include the effectiveness of takeover markets (Köke, 2004) and better firm-level governance (Anderson & Gupta, 2009).

### **2.3 Investor protection and investment timing**

Real option investment theory proposes that the value of the investment option consists of two parts: the expected net present value (NPV) of cash flows and the value of waiting to invest. A corporate manager should consider these value components when making a capital allocation decision and an investment timing

decision. The capital allocation decision corresponds to the question of how much to invest,<sup>2</sup> whereas the investment timing decision is about when to invest (Grenadier & Wang, 2005). In a frictionless economy, the capital allocation decision should be based on the NPV criteria, whereas the investment timing decision should be based on the optimal exercise strategy of the investment option. Information asymmetry and agency conflicts can affect both the capital allocation decision and the investment timing decision. Early theoretical literature focused on the capital allocation decision (Grenadier & Wang, 2005). More recently, the theoretical literature has started to analyze how information asymmetry and agency conflicts affect the investment timing decision by altering the value of the investment option.

Grenadier and Malenko (2011) analyze real options signaling games under asymmetric information. The authors apply this general framework also to a more specific case of investment timing decisions under both asymmetric information and agency problems. We start the description of their model in a general setup, but we discuss the model as if the real option were an option to invest. The authors assume that the corporate manager is better informed about the NPV of the investment project than outside shareholders. If the manager invests, the manager exercises the investment option and foregoes the possibility of investing in the future. In the presence of asymmetric information, the exercise decision of an investment option conveys a positive signal of the project quality to outsiders, since the cost of delaying investment grows with higher expected project cash flows. Thus, outsiders update their beliefs on the project's quality by observing whether investment takes place. The manager's utility from exercising the option to invest is the sum of two components: a share of the NPV of the investment and the belief of outsiders about the project's value. The manager has an incentive to deviate from the first-best (symmetric information) investment threshold since the manager's utility depends on outsiders' beliefs. Therefore, the manager's investment timing decision is partially based on the intention to send an incorrect signal of the project value. The investment threshold is obtained when the marginal costs of changing the timing of the real option exercise equals the marginal benefits from fooling outsiders. The direction of distortion in investment timing depends on whether the manager's utility increases or decreases based on shareholders' belief about the

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<sup>2</sup> Capital allocation can also include project choice in models with multiple investment projects.



project's value. The model features signal jamming<sup>3</sup> in the sense that insiders undertake a course of action or inaction with the intention to hide the true state of affairs from outsiders by sending a misleading signal.

Grenadier and Malenko (2011) apply their general model of signaling games to the investment timing decision under agency problems. The authors consider two different types of agency problems: cash flow diversion by the manager and managerial myopia (short-termism). The investment timing implications of asymmetric information depend on the nature of the agency problem. If a manager derives utility from diverting cash flows from the firm for private consumption, the manager's utility decreases with the belief of outsiders. Hence, the manager invests later to signal to outsiders that the investment project's NPV is lower. This allows the manager to divert cash flows for private benefit since the investment timing signal aims to reduce outsiders' expectations of a firm's cash flows. This reduces the difference between expected and realized cash flows, which in turn reduces the probability that outsiders engage in costly verification of realized cash flows. In the contrasting case of managerial myopia, the manager cares about both the short-term stock price and long-term earnings. The manager's utility increases with the belief of outsiders, since a higher belief of outsiders about the NPV of the investment project boosts the short-term stock price. This implies that the manager invests early to fool outsiders into overestimating the investment project's NPV. In addition, Grenadier and Wang (2005) show that optimal managerial compensation contracts do not eliminate investment timing distortions in a setting with asymmetric information and agency conflicts. They also predict investment delay when the manager and outsiders have the same level of patience. When the manager is more impatient, investment can be hurried.

Asymmetric information can also affect investment timing due to the adverse selection problem. Asymmetric information makes it difficult for outside investors to separate good firms from bad ones. This raises the cost of external financing for good firms and results in financial constraints. Unless good firms can signal their quality, they are less willing to raise external finance due to the higher costs, which results in adverse selection. The adverse selection problem refers to the situation in which only bad firms are willing to raise external finance. Myers and Majluf (1984) analyze a firm that must raise external finance to undertake a positive-NPV project.

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<sup>3</sup> The term signal jamming was coined by Fudenberg and Tirole (1986). In their model, the incumbent firm secretly cuts prices to make rivals believe that the future profitability of the market is low, therefore inducing rivals to exit.

If the firm does not undertake the project straightaway, the investment opportunity will disappear. Information asymmetry leads firms to bypass investment. In a more recent study, Morellec and Schürhoff (2011) construct a dynamic model of investment timing and financing with endogenous financing constraints arising from adverse selection. The model shows that good firms can credibly signal their growth opportunities by investment timing and financing decisions. Altering investment timing from the first-best benchmark of symmetric information is costly, but these costs are more than offset by cheaper external financing. A separating equilibrium in equity results in early investment, whereas separating in debt leads to late investment.

Shareholder protection can decrease information asymmetry and reduce agency problems (Djankov, La Porta, Lopez-de-Silanes, & Shleifer, 2008; La Porta, Lopez-de-Silanes, & Shleifer, 2006; McLean et al., 2012). Strong shareholder protection mandates reliable disclosures, which can be utilized in evaluating investment opportunities and monitoring agency problems. Easier monitoring means lower verification costs from the point of view of investors and higher expected costs of moral hazard from the point of view of firms. Many disclosures required by securities laws and laws regulating self-dealing are specifically designed to provide information on those transactions that may be used for cash flow diversion. Examples include related party transactions and excessive executive compensation. Comprehensive disclosures on executive compensation can also facilitate identification of firms that have incentives for managerial short-termism. Short-termism can arise, for example, when the manager has executive stock options with a short remaining vesting period as these stock options could give managers the incentive to prefer actions that produce a quicker payoff. In addition, some shareholder protection laws also facilitate the recovery of damages in the case of wrongdoing, further increasing the costs of moral hazard. Less information asymmetry and reduced agency problems in countries with strong shareholder protection should, in turn, be reflected in less investment timing distortion in these countries.

Creditor rights do not directly relate to asymmetric information but can nevertheless affect adverse selection and agency problems. Adverse selection in credit markets can result in credit rationing (Stiglitz & Weiss, 1981). A possible solution to the adverse selection problem is to use collateral as a screening mechanism to separate good and bad borrowers (Bester, 1985; Bester, 1987). Creditor (uninformed player) provides a menu of contracts with various collateral requirements to borrowers (informed players). A good borrower chooses the

contract with high collateral requirements due to the low probability of default, whereas the bad borrower does not do the same due to the higher risk of collateral loss. This screening mechanism can be impaired in countries where collateral is hard to grab due to poor creditor rights. Therefore, the adverse selection problem should be less severe in countries with strong creditor rights. Creditor rights can also reduce managerial incentives for agency problems such as cash flow diversion described above since creditor rights increase the adverse consequences of bankruptcy (Hart & Moore, 1998). On the other hand, creditor rights can reduce financial constraints and low financial constraints can worsen overinvestment-related agency problems.



### **3 Summary of the articles**

#### **3.1 Essay 1: How creditor rights affect the value of cash: A cross-country study**

This essay studies how a country's laws protecting creditors affect the marginal value of cash. Empirical evidence indicates that a country's laws that protect shareholders increase the marginal value of cash (Pinkowitz et al., 2006). This evidence supports agency theories where stronger shareholder rights reduce agency problems between corporate insiders and outside investors. We extend the international cash valuation literature by considering the effect of creditor rights. Power theories of credit (Djankov et al., 2007) and empirical evidence (Qian & Strahan, 2007) propose that weak creditor rights are associated with financial constraints. In addition, Faulkender and Wang (2006) show that financial constraints should increase the marginal value of cash. Therefore, we expect the marginal value of cash to be inversely related to creditor rights.

Our empirical analyses are based on a data sample of firms from 48 countries in the 1990 to 2008 period. Following Pinkowitz, Stulz, and Williamson (2006), we extend the valuation model of Fama and French (1998) by including country-level variables and their interactions with cash holdings. In addition, we similarly extend the excess stock returns-based valuation model of Faulkender and Wang (2006).

Consistent with the financial constraints hypothesis, our results show that weak creditor rights increase the value of cash. The results also demonstrate that creditor rights have at least as significant an effect on the value of cash as shareholder rights. We also find that weak creditor rights increase the value of investment. Further analysis shows that weak creditor rights increase the value of cash in subsamples of firms divided according to the median value of excess cash. Additional analysis also shows that weak creditor rights increase the value of cash only in the subsample of firms situated in countries with above-median governance scores; this finding suggests that country governance complements laws protecting creditors. This essay extends the literature on the effects of creditor rights on firm behavior. The essay also contributes to the literature on the determinants of cash valuation, particularly the literature examining cross-country differences in the value of cash.

### **3.2 Essay 2: International evidence on the operating performance of large capital investments in different financial systems**

In this essay, we analyze how financial structure affects the operating performance of large capital investments. Large capital investments are often performance decreasing corporate decisions. Thus, they provide an interesting testing laboratory for factors affecting moral hazard problems. Billett et al. (2011) find that large capital investments decrease operating performance less for well-governed U.S. firms than for their less efficiently governed counterparts, but there is no corresponding cross-country evidence on the performance of large capital investments. In the context of investment efficiency, the main theoretical argument for a bank-based system is the effectiveness of banks in identifying and reducing moral hazard through monitoring, whereas the benefits of market-based systems include the feedback from order flows of securities to corporate decisions (Boot & Thakor, 1997; Diamond, 1984).

The empirical analyses use firm-level data from 42 countries covering the 1990 to 2007 period. Following Whited (2006) and Billett et al. (2011), we focus on a sample of small firms and define an investment as large when it is 2.5 times greater than the firm's median investment. We measure the abnormal operating performance of large investments using the matching methodology of Barber and Lyon (1996). A peer for a firm undertaking large investment is a non-investment spike firm that is sought to be similar in terms of country, industry, past performance and size using a multi-stage matching procedure based on filtering and closeness criteria.

Initial sample split analysis suggest that large capital additions reduce abnormal operating performance less in bank-based financial systems than in market-based countries. Multivariate regression analysis with various sets of control variables confirms this result. In addition, the results show that the benefits of a bank-based system in terms of investment performance grow substantially with diffuse ownership. In contrast, financial development is largely unrelated to investment performance. In addition, we find that creditor rights have some independent positive effect on investment performance especially in widely held firms. Our results are consistent with the hypothesis that a bank-based financial system is more effective than markets comprising atomistic traders in resolving investment inefficiencies associated with the free-rider problem in monitoring.

### **3.3 Essay 3: How does investor protection affect investment timing? Cross-country evidence using a hazard model**

The third essay contributes by studying the relation between the legal protection of investors and investment hazards. Investment hazard is defined as the probability of a large addition to the capital stock as a function of time since the last large investment. Previous studies have examined the effects of firm-level governance and finance constraints on investment hazards (Billett et al., 2011; Whited, 2006), but there are no studies on the effect of country-level investor protection on investment timing. Theories of investment timing based on asymmetric information predict either an increase or a decrease in investment hazards due to adverse selection and agency problems. Investment hazards can increase when firms use investment timing to credibly signal positive private information (Morellec & Schürhoff, 2011) or if myopic managers alter investment timing to mislead outside investors (Grenadier & Malenko, 2011). On the other hand, investment can be delayed when the agency problem is managerial cash flow diversion (Grenadier & Malenko, 2011) or if firms separate in debt (Morellec & Schürhoff, 2011).

We utilize the hazard modelling approach to analyze a data set of firms from 51 countries over the 1990 to 2012 period. Consistent with signaling due to cash flow diversion, the results show that shareholder protection is related to higher investment hazards, particularly among the smallest firms. The results also indicate that creditor rights are associated with higher investment hazards, but the effect is not concentrated in the smallest firms. This suggests that asymmetric information may not be the primary explanation of why creditor rights are related to investment timing.





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## Original publications

- I Kyröläinen, P., Tan, I., & Karjalainen, P. (2013). How creditor rights affect the value of cash: A cross-country study. *Journal of Corporate Finance*, 22, 278-298. <https://doi.org/10.1016/j.jcorpfin.2013.06.001>
- II Kyröläinen, P., & Tan, I. (2018). *International evidence on the operating performance of large capital investments in different financial systems*. Manuscript.
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