Funding Arrangements in the Modern Market for Legal Services

Yue Qiao

Submitted for the degree of Ph.D. in Economics

Department of Economics
University of Surrey

February 2008
©Yue Qiao 2008
ABSTRACT

This thesis uses theoretical models to study the effects of recent developments in the funding of civil litigation in England and Wales. This involves a form of contingency payment (conditional fees), a legal expenses insurance that can be purchased either before or after an accident has taken place and the combination of them. The issue revolves around the implications of litigants' choices and lawyers' effort decision. More recently, policy discussion has raised the possibility of legal service being delivered in new organisational structures.

We first use a model to analyse the combined effects of the insurance and the fee arrangements on settlement probabilities, settlement amount, care levels and litigants' welfare. After that, we extend our model to consider the role of risk aversion in litigation and the timing of settlement. Then, we examine the effects of law firm's organisational structure and ownership changes on its legal effort provision in a property rights framework. Our results show that plaintiffs generally benefit from an organisational structure which allows law firms to provide legal insurance services. Efficiencies and welfare effects of other potential business structures are also examined. Other issues such as the three-way relationship between a client, his lawyer and an insurer and comparisons between health care insurance and legal expenses insurance are also discussed in this thesis.

This thesis differs from other contributions in this area for two reasons. First, it recognises the complementarity between fee reform and structural developments. Second, it considers the effects of these arrangements on lawyer effort.
This thesis is a result of four years of study during which I have been accompanied and supported by many people. It is a pleasant opportunity now to express my gratitude to all of them.

The first person I would like to thank is my supervisor Prof. Neil Rickman. I have been under his supervision for five years since I drafted my M.Sc dissertation. During these years I know him as an enthusiastic and principle-centered person. His passion on research has made a deep impression on me. I owe him lots of gratitude for sharing his knowledge and expertise with me. Besides of being an excellent supervisor, Neil is a good friend to me. I am really glad that I have come to get to know him in my life.

I am deeply grateful to my second supervisor, Prof. Paul Levine, whose stimulating suggestions and encouragement helped me in all the time of research for and writing of this thesis.

I owe my sincere gratitude to Dr. Heather Gage, who gave me the opportunity to work with her in her health economics projects and gave me untiring help during my difficult moments. I would also like to express my sincere thanks to Prof. Graham Bird, who has been my personal tutor for many years, for his continuous encouragement and helpful advices.

I would like to thank all staff and research students of the department for their important supports throughout my study. They made my life much easier.

Finally, I would like to dedicate this thesis to my parents and my wife. Their patient love and supports enabled me to complete this work.
## Contents

1 Introduction .............................................................. 1
  1.1 The market for legal services ........................................ 2
  1.1.1 Reform of legal services ........................................ 3
  1.1.2 The civil litigation process ...................................... 4
  1.2 Funding legal services ............................................. 5
  1.2.1 Conditional fees .................................................. 5
  1.2.2 Legal expenses insurance ...................................... 7
  1.2.3 The three-way relationship in legal expenses insurance . 8
  1.3 Research questions .................................................. 11
  1.4 Plan of chapters ..................................................... 13

2 The economics of civil litigation: a survey ....................... 19
  2.1 Introduction ........................................................ 20
  2.2 The economic model of litigation ................................ 21
  2.2.1 Settlement versus trial: non-strategic models ............ 22
  2.2.2 “One-shot” strategic models ................................ 24
  2.2.3 Dynamic strategic models .................................... 29
  2.3 The English versus American Rule ............................. 34
  2.3.1 Effects on legal expenditures ................................ 34
  2.3.2 Effects on settlement .......................................... 36
  2.3.3 Evidence on the effects of fee shifting ..................... 38
  2.4 Principal-agent issues and legal fee arrangements .......... 39
  2.4.1 The lawyer’s effort decision ................................. 40
  2.4.2 Agency problems associated with conditional fees ...... 45
  2.4.3 Extensions to Emons and Garoupa (2006) ................ 52
  2.5 The role of legal expenses insurance .......................... 56
  2.6 Studies on health care insurance ............................... 61
  2.6.1 Health care insurance and legal expenses insurance .... 62
  2.6.2 Optimal health care insurance system ..................... 65
5 Conclusions ................................................................. 165
5.1 Discussion of results ................................................................. 166
    5.1.1 Analytical structure ................................................................. 166
    5.1.2 Answers to the research questions .................................... 167
5.2 Further research ................................................................. 171

7 Bibliography ................................................................. 174
Chapter 1

Introduction
This thesis uses theoretical models to study the effects of recent developments in the funding of civil litigation in England and Wales. As the Introduction of the thesis, this chapter introduces the background and the main changes in the legal service market in England and Wales that are of interest to us. These are the emergence of conditional fees and legal expenses insurance and potential changes to the structure and regulation of law firms. In fact, as we shall see, these are all closely related. Section 1.1 briefly introduces the market for legal services and gives some background on the regulatory changes that underlie much of the thesis. Section 1.2 discusses the emergence of conditional fees and legal expenses insurance, and illustrates some of the arguments related to them. Section 1.3 proposes our research questions and explains why they are the focus of this thesis. Section 1.4 sets out the structure of the subsequent chapters.

1.1 The market for legal services

In England and Wales, the traditional legal service market has been changing since 1990s. The introduction of conditional fees and emergency of legal expenses insurance are two significant factors contributing to this change. These changes are of interest to economists and others alike since they raise questions about incentives and access to justice. They have also encouraged a set of reforms relating to the structure of law firms as emphasised by the government’s recent Legal Service Bill.
1.1.1 Reform of legal services

In July 2003, David Clementi was appointed to carry out an independent re-
view of the regulatory framework for legal services in England and Wales. In December 2004, he published a report following his review. The govern-
ment's Legal Service Bill broadly accepted the main recommendations of the report and the review. To fulfill the purpose of promoting competition in le-
gal services market, in addition to regulatory reforms, in the report Clementi provides a proposal to change the current legal business structure. He recom-
mends allowing different types of lawyers to share in the management of what he calls Legal Disciplinary Practices (LDP). Non-lawyer managers would also be permitted but lawyers would remain in the majority as managers and only legal services could be provided. More important, outside owners would be permitted subject to regulatory approval as “fit to own”. In fact, the govern-
ment envisages more complete “liberalisation” in legal services reform. The Legal Service Bill also considers the possibility of Multi-Disciplinary Practices (MDP), which offer legal and other services and are not exclusively owned by managers, should be established. These new institutions may fundamentally change the landscape of legal services market, or even the legal system. The effects of them need to be carefully reviewed.

Economic analysis of a market institution is normally based on the analysis of its efficiency. However, in the context of legal services, efficiency has to be considered with equity. This implies that the whole litigation system should be made accessible through affordable services, and at the same time encourage litigants to avoid litigation: the former reflects the requirement of social
equality; the latter seeks social efficiency when considering the litigation cost as a kind of transaction cost.

1.1.2 The civil litigation process

A typical civil litigation process involves a number of stages. Initially, the potential defendant chooses a level of care to avoid an accident. If this care level is insufficient to avoid the accident, the potential plaintiff will incur a loss.\footnote{In reality, in many cases both the plaintiff and the defendant can prevent an accident. However, in this thesis we follow the typical assumption in models of efficient care that an accident is caused entirely by the defendant's negligence.} After this, the plaintiff has to decide whether to pursue the defendant. Normally, the plaintiff has a lack of legal knowledge and therefore has to retain a lawyer if he decides to bring a suit. If the formal legal proceedings begin, the plaintiff, the defendant and their lawyers will negotiate an agreement to settle the suit. If the negotiation fails, the case will go to trial and a judgement will finally be given. We show this structure in Figure 1.1. The litigation is costly. For the litigants, legal fees can be an important factor affecting their litigation decisions. In the absence of legal expenses insurance, the plaintiff may be prohibited from starting a suit by the unaffordability of legal fees. For the public,
since at least a part of cost of the legal system is borne by tax payers, the number of accidents and the volume of litigation could affect social welfare. Of course the litigation is also risky. Not only does trial leave the losing party whatever financial loss is the object of litigation, but some jurisdictions, for example England and Wales, also require the losing party to meet all costs of litigation, including those of the winner. Both conditional fees and legal expenses insurance are market responses to these risks.

1.2 Funding legal services

Before 1990, legal services were mainly funded by hourly fees. It is traditionally believed that hourly fees can mitigate the conflicts of interest between clients and lawyers.\(^2\) Hourly fees may help to solve the credence good problem often associated with legal services since the lawyer’s margins are the same whether the case is simple or complex, while they also give incentives to lawyers to work slowly and longer since their total income will increase by doing so. For those who cannot afford legal fees, state funded legal aid had provided access to justice until recently. However, since legal aid no longer covers civil cases, other funding methods have been developed.

1.2.1 Conditional fees

Conditional fees were first introduced by the government in the Courts and Legal Services Act 1990, but the relevant statutory instruments were not in force until 1995. Under conditional fees, a lawyer can charge her client a nor-

\(^2\)For example, Gravelle & Waterson (1993) claim that, when making settlement decisions, hourly fees can align the interest of clients and lawyers.
mal fee which is based on hourly billing, plus a success fee if the case is won. The amount of the success fee is limited to a maximum of 100 per cent of the normal fees. Initially, the success fee was not recoverable from the losing party, but in 2000, section 27 of the Access to Justice Act 1999 amended the Courts and Legal Services Act 1990 to allow recovery of success fees from the losing party. The regulations that accompanied this change in the law (the Conditional Fee Agreements Regulations 2000) were far from clear, and the result was that a great deal of fees-related litigation took place. On 1 November 2005 these regulations were revoked, and now it is much easier to enter into conditional fee agreements than before.3

The introduction of conditional fees was expected to solve two problems. First, conditional fees provide incentives to lawyers to undertake high risk cases. Second, conditional fees may solve the problem of rising costs of legal aid. The common understanding of disadvantage of conditional fees is that they may result in a conflict of interest between lawyer and client. This is because the lawyer’s financial interest in the case may impair her impartiality, causing her to ignore the best outcome of the client. In addition to the conflict of interest, Lord Bingham’s judgement on Callery v Gray (2001) generalises other critique on conditional fees. He concludes that conditional fees are open to three forms of abuse: “First, lawyers might charge excessive costs knowing that their own client would not have to pay them. Another, for the same reason, was the

---

3Conditional fee agreements, otherwise known as “no win no fee” agreements, can be thought as an English equivalent to the American contingent fee. This is because they both set legal fees contingent on the outcome of the case. In the case of the American contingent fees, a client is not charged legal fees if he loses the case. If the client wins or settles, the legal fee is calculated as a share of the eventual damage judgment or settlement won by the client. Fees usually range from 25% to 50% of the amount recovered, although 30-40% is the most common.
lawyers would set the success fee at a level that was grossly disproportionate to any fair assessment of the risks of failure in the litigation. A third possible abuse, with insurers having no incentive to moderate premiums, was that they might be grossly disproportionate to the risk being underwritten.” The third abuse actually is one of the possible combined effects of conditional fees and legal expenses insurance.

1.2.2 Legal expenses insurance

Legal expenses insurance is a relatively new form of insurance in the UK, having only been available since 1974 (Rickman & Gray 1995a). It provides cover against the risk of making or defending a legal action, whether in court or not. It will pay for lawyers’ fees and other costs arising in legal actions, up to the limit of indemnity in the policy. Legal expenses insurance can be purchased either as before-the-event (BTE) insurance or as after-the-event (ATE) insurance. BTE insurance provides cover for legal claims that may happen and is very often sold in the same way and at the same time as other annual insurance contracts, for example when buying motor insurance or household insurance. It is very commonly used as a way of bringing compensation claims arising from road accidents and from consumer contract disputes. ATE insurance provides cover for a specified legal claim after the disputed event or accident has happened. It basically protects the policyholder from the risk of having to pay his opponent’s legal costs in that dispute. ATE is often sold, but not necessarily, through legal service providers who are using conditional fee agreements. This character of ATE insurance means it is likely to be available only where the chances of winning a case are high.
In England and Wales, the vast majority of legal expenses insurance policies are BTE. Legal expenses insurance, especially BTE, sales are underpinned by an established network of insurance distributors, of which major insurance brands are the key providers. From this viewpoint, the legal expenses insurance market has firm foundations. The sales of legal expenses insurance is estimated to be £411 million in gross written premiums in 2005.4

The principal rationale of legal expenses insurance is the same as other insurances: the risk averse individual shifts his risk to a risk neutral insurer who is better able to bear it by a certain premium. In England and Wales, however, even lawyers can work on a conditional fee basis, the risk of liability for opponents’ legal fees still encourages the development of legal expenses insurance. Also, Kirstein (2000) and others develop strategic grounds for demanding insurance: even risk neutral parties can gain by enhancing their bargaining position through lower costs.

1.2.3 The three-way relationship in legal expenses insurance

The introduction of legal expenses insurance for the market of legal services results in a structural change of the market. Bowles & Rickman (1998) characterise the change as a “three-way” relationship between groups with an interest in the provision of goods and services. The client purchases insurance from the insurer and receives services from the lawyer. The lawyer supplies legal services to the client and receives reimbursement from the insurer. Asymmetric

information exists on every side of this relationship. The insurer has imperfect information about the client's risk type and the lawyer's reimbursement. The client has imperfect information about the lawyer's effort. The lawyer has imperfect information about the client's position. The three-way relationship can be understood as each player trying to maximise his interest by means of contracting with others. In this relationship, the lawyer is an agent for both the insurer and the client. Figure 1.2 illustrates this three-way relationship. We now look into it in more detail.

Figure 1.2: The lawyer-client-insurer nexus of contracts (Bowles & Rickman 1998)

The lawyer-client relationship

The key issue in the lawyer-client relationship is the principal-agent problem. The client is normally "ignorant" of legal knowledge. In some cases although he can observe the lawyer's legal effort, he does not know either the exact legal effort he needs or the effectiveness of the lawyer's effort. This encourages the lawyer's moral hazard. The introduction of conditional fees is hoped to be a
remedy of this problem. Since the lawyer's income is entirely based on the outcome of the case under conditional fees, she is supposed to have incentives to provide more effective effort. If the client has legal expenses insurance, the situation becomes more complicated. In the case of full insurance, the client has no incentive to control the lawyer's effort whether it is effective or not. He will encourage the lawyer to raise inputs on his case. This is another type of moral hazard. Then the insurer has to control these two types of moral hazard through the insurance contract and through the service payment contract.

The insurer-client relationship

Adverse selection and moral hazard are both involved in the insurer-client relationship. In the sense of adverse selection, it means the propensity of a client to buy insurance may be significantly higher if he has characteristics that make him more likely than others to bring a legal claim. The economic approach to adverse selection is to set the insurance premium on the basis of the client's risk. For the BTE insurance, since the premiums are comparatively low, it is not feasible to evaluate individual clients. The development of larger and more balanced risk-pools is considerably easier in the case of add-on policies than in the case of stand-alone policies. In the sense of moral hazard, there are three possible damages. First, the insured client may be more likely to initiate a legal claim than an uninsured person. Second, the insured client may request more legal services than an uninsured person. Third, the insured client may have no incentive to monitor the lawyer's behaviour. The solutions to these problems may have to find from the contracts of the insurance system.

The insurer-lawyer relationship

10
Asymmetric information on the lawyer's legal effort is the most important problem in the insurer-lawyer relationship. Since monitoring is costly to insurers, lawyers can always reimburse insurers for inappropriate costs. To mitigate the harms of asymmetric information insurers bargain hard with lawyers to reduce costs, or create panels whose members agree to defined fee levels. However, these are difficult to operate in practice. In particular, insurers hire lawyers for in-house work to assess claims, meaning that they may be already capable to provide legal services to policy holders. However, law and regulation currently prohibit insurers from providing further legal services. Therefore, insurers may prefer to contemplate either some degree of vertical integration with lawyers or some "robust" fee arrangements with lawyers to reduce costs.

1.3 Research questions

As illustrated in previous sections, the emergence of legal expenses insurance and conditional fees, together with the reform of legal services, make the analysis of legal service market more complicated. Naturally, a number of questions arise from these new market institutions. We focus on three of these. They are two positive questions and one normative question:

1. What are the combined effects of legal expenses insurance and legal fee arrangements on litigation?

2. What are the effects of a law firm's organisational structure on a lawyer's incentives to act in the best interests of clients?

3. What is the optimal legal expenses insurance system?
Question 1 is a positive question which aims to look into the combined influence of legal expenses insurance and legal fees on the litigants’ behaviour. It is clear that both legal expenses insurance and conditional fees encourage access to justice, but they may also motivate the wastage of social resources on litigation, e.g. increase volume of litigation. This possible conflict encourages us to study this question. Question 1 is directly relevant to the discussion of litigation reform. It concerns the design of optimal legal expenses insurance system *per se* in a framework where fee arrangements and funding methods are restricted by regulation.

Question 2 is a positive question. It is one of the key issues of the current debate on legal services reform. As we mentioned before, the Clementi Report (2004) on legal services reform and the government’s Legal Service Bill suggest that legal services providers move from one of the currently allowed organisational structures (sole trader, partnership, incorporated partnership) to an organisational structure where there is at least some element of outside ownership. Answering Question 2 is important to the examination of potential effects of current legal services reform.

Question 3 is a normative question. It is closely related to the purpose and policies of current legal services reform. Based on positive exercises of Question 1 and Question 2, we try to understand the optimal legal expenses insurance system in perspectives of social cost, the client’s best interest and structure developments of legal services. Meanwhile, answering Question 3 is an essential prerequisite to any policy change on fee arrangements and on institutional development.
1.4 Plan of chapters

The previous section raises three interesting research questions. In Chapters 3 - 4, we begin to answer these questions by developing some theoretical frameworks. However, we start from Chapter 2, where we explain the reasons of choosing frameworks that we do. The chapters are structured as follows.

Chapter 2 is a survey of existing theoretical economic literature in litigation. In the chapter, we first examine the literature on litigation settlement. After that, we look into the analysis of fee shifting rules. The principal-agent problem in litigation is one of the key issues we focus on. The economic models of the following chapters are basically based on these literature. In particular, a close scrutiny is given to the literature related to conditional fees. Finally, the role of legal expenses insurance is reviewed although very few studies explicitly address this question. The gaps between the existing studies are illustrated in the chapter. Chapter 2 actually suggests that none of the research questions in Section 1.3 has been answered yet.

In addition to confirming our research questions, Chapter 2 also presents original extensions of the recent paper by Emons & Garoupa (2006). In particular, it shows that the results in their paper rely on particular functional forms. Moreover, similarities and differences between legal expenses insurance system and health care insurance system are also documented in Chapter 2.

As the most important relationship within legal services, the three-way relationship between the client, the lawyer and the insurer, which is illustrated in
the triangle of Figure 1.2, dominates our research. However, to answer our research questions and also analyse this relationship more efficiently, in Chapter 3 and 4 we focus on two key decision makers in the triangle. In Chapter 3, the "key player" is the client, while in Chapter 4, it is the lawyer.

![Figure 1.3: Chapter 3: the client is the key player](image)

Chapter 3 focuses on the client’s trial/settlement decision. In the chapter we look into the combined effects of legal expenses insurance and fee arrangements on settlement. As shown in Figure 1.3, contracts and other players’ actions have important effects on the client’s choice. Our analysis starts from the comparison between three regimes: no insurance, after-the-event (ATE) and before-the-event (BTE) insurance, and follows by comparing between two specified fee arrangements: the hourly fee and the conditional fee. Several issues, such as the plaintiff’s risk type, distribution of the accident loss, recov-
erability of insurance premium and timing of the settlement, are examined in the discussion section. In particular, the comparison reaches some firm conclusions when the loss arising from the accident is uniformly distributed. The basic one-shot model used for most of the chapter is finally extended to be a dynamic one. Chapter 3 partly answers our first research question — “what are the combined effects of legal expenses insurance and conditional fees?”

Figure 1.4: Chapter 4: the lawyer is the key player

As shown in Figure 1.4, Chapter 4 encompasses the lawyer's effort choice under the three-way relationship. The chapter focuses on two interesting questions. First, the combined effects of fee arrangements and legal expenses insurance on the lawyer's legal effort are examined in an environment where the client relies totally on the lawyer's advice about the needs of the case. We highlight

---

5An earlier version of this chapter was presented at the Annual Conference of European Law and Economics Association (EALE), Madrid, September 2006.
interactions of litigants by introducing a contest success function. Second, the effects of the law firm's organisational structures on its legal effort provision are analysed. The basic model of the chapter is a property right model of industrial organisation based on Grossman & Hart (1986). We illustrate that reputation incentives play an important role in the lawyer's effort choice. Issues of the firm's investment into its human capital are discussed as well. The chapter is ended by the analysis of social welfare. Chapter 4 answers our second research question — "What are the effects of a law firm's organisational structure on a lawyer's incentives to act in the best interests of clients?"\(^6\)

Combining the analysis and conclusions of Chapter 3 and 4, we can answer our third research question — "what is the optimal legal expenses insurance system?"\(^6\)

\(^6\)An earlier version of this chapter was presented at the Annual Conference of AsLEA, Taipei, August 2007 and the Annual Conference of EALE, Copenhagen, September 2007.
system?" As contracts’ designer, now the insurer becomes the key player in the three-way relationship. When designing the system, the insurer has to consider the combined effects of insurance and legal fee arrangements on settlement (Chapter 3) and on the lawyer’s effort provision (Chapter 4). Figure 1.5 illustrates this situation and shows the key role of the insurer. The answer to the research question 3 is recorded in Chapter 5.

It is clear that Chapters 3 - 4 can be seen as the analysis of litigation from different perspectives. However, they can also be understood as the analysis of litigation within different contexts. Chapter 3 examines the interactions between the plaintiff and the defendant and focuses on the litigant’s behaviour. Chapter 4 solves the organizational structure problem of the law firm and focuses on the lawyer’s legal effort provision. Since legal expenses insurance and conditional fees exist mainly in the English cost rule jurisdictions, in this thesis the English rule is used as the fee shifting rule in all analysis chapters. However, even though legal expenses insurance is rare in the US, in Chapter 3 we still discuss the implications of insurance and settlement under the American cost rule (as well as the English one).

The main contributions of this thesis are as follows. In Chapter 2, apart from the critical review of the current economic studies on litigation, we firstly extend the model of Emons & Garoupa (2006) to attain some new insights, and secondly, compare legal expenses insurance with health care insurance. These works may help one to gain a better understanding on legal expenses insurance. In Chapter 3, a comparison between ATE conditional fees and BTE hourly fees, which are the prevailing funding methods in England and Wales,
emerges. This involves the issues of settlement versus trial, the accident distribution, litigants’ risk aversion, insurance recoverability and social welfare. A dynamic extension is also introduced to examine the settlement timing. In Chapter 4, we introduce the theory of industrial organisation into the context of litigation. The chapter is the first to study the relationship amongst the lawyer’s legal effort, fee arrangements and the organisational structures of the law firm. In line with the current policy debate, we examine the law firm’s possible alternative organisational structures and find some of these structures encourage higher legal effort from the lawyer, to the interest of the client.

Chapter 5 concludes by discussing the implications of the previous chapters. As part of this, suggestions for extensions to the current models and future works are given. We hope this thesis can be extended both theoretically and empirically and contribute to the knowledge of the economic analysis of litigation and legal services.
Chapter 2

The economics of civil litigation: a survey
2.1 Introduction

Started by Landes (1971), Gould (1973) and Posner (1979), the economic analysis of civil litigation is one of the most fruitful areas of law and economics research. Economists are interested in the resolution of legal disputes for several reasons. First, the solutions of disputes (e.g. settle or go to trial) have important implications for the costs of operating the legal system. Second, economic analysis can help to explain the interactions of litigants and therefore offer recommendations for a more efficient legal system (encouraging settlements and discouraging worthless suits). Third, the costs and the solutions of disputes affect incentives for litigants to avoid dispute in the first place. Hence, the economic analysis of litigation has focused both upon the interactions of litigants and upon the effects of legal fees and procedural rules on the litigants' behaviour (see Cooter & Rubinfeld (1989) and Miceli (1997) for previous reviews).

In this chapter, we focus on the following four topics. First, in Section 2.2, we summary the economic models which analyse settlement decisions and pre-trial negotiation. We start from the "non-strategic" models to show how litigants' optimism affects their settlement decisions. Then we move to more complicated "strategic" settings. We show how screening and signaling are modeled in the litigation context. We also review dynamic pre-trial negotiation models in Section 2.2.3. In Section 2.3, we look into the studies of fee shifting rules. Our review focuses on the effects of fee shifting rules on legal expenditure and on settlement. Section 2.4 examines principal-agent problems in litigation. The analysis is based on legal fees' effects on agency problems. Since contingent
fees are prohibited and conditional fees are allowed in England and Wales, in 2.4.2, we detail the studies of conditional fees. In Section 2.5, we briefly review the literature associated with legal expenses/costs insurance. In Section 2.6, we compare legal expenses insurance with health care insurance and review the literature on health insurance system. Section 2.7 briefly summarises.

2.2 The economic model of litigation

The basic economic model of litigation has two parties, a plaintiff that has a potential claim against the defendant. Under the American cost rule, the plaintiff’s expected value of the claim $EU_p$ equals his estimate of the probability of prevailing $p_p$ multiplied by the expected trial award, which is normally assumed to be the accident loss $L$, minus the costs of proceeding to the next stage of litigation $c_p$.

$$EU_p = p_p L - c_p.$$ 

The defendant’s objective function for expected cost $EC_d$ is developed in parallel fashion, as the defendant’s estimate of the probability the plaintiff will prevail $p_d$ times the expected award $L$ plus the defendant’s costs of proceeding to the next stage of litigation $c_d$.

$$EC_d = p_d L + c_d.$$ 

Of course, the variables in the above model can be endogenous. For example, Cornell (1990) develops an environment where both parties’ selections of costs may affect their estimates of the outcome, and one party’s choice of $c$ may affect the other party’s estimate of its own cost of proceeding to the next
stage. \( EU_p \) and \( EC_d \) primarily determines the incentives given to litigants, including, most important, the decision whether settle or go to trial.

2.2.1 Settlement versus trial: non-strategic models

Since one of the main purposes of litigation is to induce settlements rather than costly trials, it is particularly important to examine the factors which will affect litigants' settlement decision. The "classical" studies (mainly including Gould (1973), Posner (1979) and Landes (1971)) assume that there is no private information to be communicated during negotiations between two parties and, indeed, no explicit modeling of a bargaining framework in which this could occur. In this sense, they are "non-strategic"\(^1\); both parties assess their expected gain from trial on the basis of their knowledge and these assessments determine whether, and what, scope for settlement exists—neither takes account of the other's actions. These studies propose the necessary condition for settlement is that the plaintiff's minimum offer—the least amount he will take in settlement of his claim—be smaller than the defendant's maximum offer. Extending to our basic model, define \( L_i, i = p, d \) as the recovery the plaintiff and the defendant expect to receive/pay at trial. We also assume that both are risk neutral, that their expenditures on the case are independent of \( L_i \) and \( p_i \), and of each other's. The plaintiff's minimum offer is his expected gain from trial \( EU_p \), which is \( p_p(L_p - c_p) - (1 - p_p)c_p \), while the defendant's maximum offer is his expected trial cost, \( EC_d = p_d(L_d + c_d) + (1 - p_d)c_d \). Thus

\(^1\)Following Rickman (1998) and Penn & Rickman (2001), we can identify three broad phases of theoretical work by economists on litigation. They are non-strategic models, one-shot models and dynamic strategic models.
the necessary condition for settlement is

\[ p_p L_p - c_p < p_d L_d + c_d. \]

Rearranging above condition yields

\[ p_p L_p - p_d L_d < (c_p + c_d). \]

A minimum requirement for the above condition to hold is \( p_p L_p > p_d L_d \). In a more basic presentation, \( L = L_p = L_d \), the condition becomes \( p_p > p_d \). Posner labels this as a “mutual optimism” condition: the more optimistic both parties are about their chances at trial, the worse are the prospects for settlement. Going back to our condition, clearly, anything that raises \( p_p L_p - p_d L_d \) and/or lowers \( c_p + c_d \) will narrow the range within which a settlement can occur and thereby increase the likelihood of trial. Thus, substantial bargaining costs can prevent settlement, as can low court costs and high stakes. But it is not a sufficient condition for settlement to take place; e.g. parties may fail to agree on a settlement amount. However, without private information and a bargaining framework, it is difficult to explain why and how two rational agents disagree when they know that gains from trade exist (e.g. see Salant (1984) and Schweizer (1989)). Also, within this context, it is impossible to specify a settlement amount. Instead, this will be determined by the two sides’ relative bargaining strengths. The analysis can be made more general by introducing risk aversion. One way to think about this is in terms of certainty equivalents. Define the plaintiff’s certainty equivalent to trial as \( v_p \), i.e.

\[ U_p(v_p) = p_p U_p(L_p - c_p) + (1 - p_p) U_p(-c_p), \]

where \( U_p(\cdot) \) is the plaintiff’s von Neumann-Morgenstern utility function. Thus, the maximum that the
plaintiff will pay to avoid trial is \( v_p^* \equiv (p_p L_p - c_p) - v_p \). Similarly, define \( v_d^* \equiv v_d - (p_d L_d + c_d) \). Thus, the necessary condition for settlement becomes:

\[
p_p L_p - c_p - v_p^* < p_d L_d + c_d + v_d^*
\]

Rearranging this condition yields

\[
p_p L_p - p_d L_d < (c_p + c_d) + (v_p^* + v_d^*)
\]

Hence, risk aversion makes the necessary condition for trial harder to fulfill so that settlement becomes more likely. Note also that as either party becomes more risk averse an increase \( v_i^* \) is implied, making settlement still more likely. Gravelle (1989) shows that, in the context of imperfect information, an increase in one party's risk aversion makes the settlement terms more favourable to the other party: effectively, the widening of the "settlement range" which makes settlement more likely under risk aversion is accomplished by a weakening in the risk averter's bargaining position. The effects on the settlement rate of switching between different cost allocation rules can be seen by recognising that these alter the plaintiff's and the defendant's objective functions and thus alter the settlement condition.

### 2.2.2 “One-shot” strategic models

Beginning with P'ng (1983), a number of models have sought to model explicitly the process of pre-trial negotiation, and to take account of the fact that such activity often takes place under conditions of asymmetric information. Of course, these considerations immediately raise questions about the appro-
pimate extensive form to describe the negotiations. One issue here involves the number of pre-trial periods $T$ available for bargaining: in this section, we simplify by assuming that $T = 1$ and defer more explicit dynamics to the next section. Another key issue involves who has private information and who makes settlement offers. Both the plaintiff and the defendant can plausibly be thought to have private information about the strength of their case: e.g. the plaintiff may be expected to know more than the defendant about the extent of the loss he has suffered ($L$), while the defendant may be expected to know more about his liability for the damages in question ($p$). Alternatively, there may be asymmetric information about risk preferences (see Farmer & Pecorino (1994) and Heyes, Rickman & Tzavara (2004)). Assumptions vary as to whether one or both parties have private information. Thus, Bebchuk (1984) assumes a one-sided information asymmetry with the uninformed party making the one-shot settlement offer. In contrast, Reinganum & Wilde (1986) assumes a one-sided asymmetry but, now, with the informed party making the single offer. The former is the problem of screening and the latter is the problem of signaling. In this subsection, we focus on these two problems. Finally, Schweizer (1989) and Daughety & Reinganum (1995) assume that both sides have private information. Given the familiar problems surrounding multiple equilibria in signaling games, the latter papers employ equilibrium refinements to ensure uniqueness.

2.2.2.1 Screening

We use a one-sided information model which is similar to Bebchuk (1984) to show screening in pre-trial negotiation. Assume that the plaintiff has suffered an accident loss $L$ but that the defendant can not accurately observe it. In-
instead, his priors are given by the cumulative distribution $F(L)$ on $[L, \bar{L}]$, with associated density function $f(L)$. For convenience, assume $pL > c_p$. The defendant makes a single settlement offer $S$ to the plaintiff, acceptance ends the game while rejection induces trial. At trial, the court hands the correct level of loss to the plaintiff with probability $p$, and otherwise finds in favour of the defendant. This model is formally equivalent to the model of Bebchuk (1984). In the original model, the defendant is privately informed about liability but the plaintiff makes the settlement offer. Therefore, differences between this model and Bebchuk’s are the source of private information and the party makes settlement offer. However, there are no substantive differences between the analysis.

Analysis begins with the plaintiff’s decision to accept or reject a given settlement offer. The settlement offer $S$ is accepted if and only if $S \geq pL - c_p$. This defines the plaintiff’s marginal acceptance level:

$$\hat{L}(S) = \frac{S + c_p}{p}$$

Thus, the defendant’s choice of $S$ will determine the plaintiff’s acceptance level and, hence, the probability of settlement $F(\hat{L}(S))$. The defendant chooses $S$ to solve

$$\min_S F(\hat{L}(S))S + \{1 - F(\hat{L}(S))\} \left\{ p\int_{L}^{\bar{L}} L f(L) dL \right\} \left\{ \frac{\int_{L}^{\bar{L}} L f(L) dL}{1 - F(\hat{L}(S))} + c_d \right\}$$

The first order condition is given by

$$f(\hat{L}(S))\hat{L}'(S)S + F(\hat{L}(S)) - p\hat{L}(S)\hat{L}'(S)f(\hat{L}(S)) - f(\hat{L}(S))\hat{L}'(S)c_d = 0$$

To minimise expected costs, the defendant trades off the expected costs of
settlement with the expected costs of trial. Substituting the plaintiff’s acceptance level \( \hat{L}(S) = \frac{S + c_d}{p} \) into the first order condition, the defendant’s optimal decision becomes

\[
\frac{F[\hat{L}(S)]}{f[\hat{L}(S)]} = (c_p + c_d)\hat{L}'(S)
\]

If the form of \( F(L) \) is given, the optimal settlement offer \( S^* \) can be solved from the above condition. It is clear now the type of the plaintiff is represented by the acceptance level \( \hat{L}'(S) \). Thus, the plaintiff has been screened. This condition can be used to perform a variety of comparative statics and to consider a variety of policy issues within the legal system. For example, assuming that \( F(L) \) is uniform distributed and \( \hat{L}'(S) = 1/p \), we have

\[
\hat{L}^* = \hat{L} + \frac{(c_p + c_d)}{p} \\
S^* = p\hat{L} + c_d
\]

Hence, settlement offers rise with the defendant’s liability, expected damages and expected costs. However, the probability of settlement falls as \( p \) increases (although the defendant is weaker, the plaintiff knows this when liability is common knowledge) but rises with aggregate trial costs (as in non-strategic model). Another significant result is that trial cannot be ruled out. The presence of asymmetric information makes it difficult for uninformed parties to make an appropriate offer or to select a sufficiently generous acceptance probability. Thus, the presence of strategic behaviour means that the necessary conditions for settlement derived earlier are not sufficient.
2.2.2.2 Signaling

Reinganum & Wilde (1986) assume that the plaintiff has private information about the true level of accident loss $L$. The defendant can only estimate the loss on the interval $[L, \bar{L}]$. Different from the screening model, here the plaintiff makes his settlement offer/demand and the defendant chooses to accept or reject it. The plaintiff’s optimal settlement offer $S$ is a function of his information $S = s(L)$. The defendant’s strategy consists of a function linking the probability of rejecting the settlement offer to the offer itself, $\sigma = \sigma(S)$, and a belief uniquely linking the accident loss and the settlement, $L = b(S)$. The probability of the plaintiff prevailing at trial $p$ is exogenous and common knowledge. As in most signalling models, the informed agent has a costly move to illustrate his type to the uninformed agent. In the litigation context, since for the high loss plaintiff the cost of a breakdown in pre-trial negotiations is lower than for the low loss plaintiff, signalling becomes a possible choice for the plaintiff. The authors focus on a separating equilibrium, which is defined as: a triple $(b^*, \sigma^*, s^*)$ satisfying: (1) given $b^*(\cdot)$, $\sigma^*(\cdot)$ maximises the defendant’s expected wealth; (2) given $\sigma^*(\cdot)$, $s^*(\cdot)$ maximises the plaintiff’s expected wealth; and (3) $b(S) \in [L, \bar{L}]$ for all $S$, with $b^*(s^*(L)) = x$ for all $L \in [L, \bar{L}]$.

Reinganum & Wilde (1986) prove that the game has a unique separating sequential equilibrium for the out-of-equilibrium beliefs they specify. These beliefs simply assert that the defendant assumes any settlement offer above the equilibrium one from the plaintiff with loss $\bar{L}$ to have come from this type, and any offer below the equilibrium one made by the plaintiff with loss $L$ to have come from this type. The problem of adverse selection is here. The plaintiff
has incentives to misrepresent his settlement offer since the defendant does not know the real loss. Therefore, the probability of rejecting the settlement offer must increase with \( S \) to prevent low loss plaintiffs from emulating high loss plaintiffs. The discontinuity in \( \sigma^*(\cdot) \) at \( 3 \) prevents any plaintiff from demanding \( s^*(L) > 3 \) since the defendant knows no such high loss exists. In separating equilibrium, the incentive compatibility of \( \sigma^*(\cdot) \) induces each plaintiff to signal his type, therefore \( s^*(\cdot) \) is monotonically increasing. The outcome is the asymmetric information creates a non-zero equilibrium probability of trial.

The intuition behind the analysis is profound. Asymmetric information will generally result in some degree of inefficiency in the bargaining process. The extent of inefficiency is related to the nature of the distribution of the information. Because the plaintiff’s private information can not be credibly passed to the defendant without a cost being incurred by the plaintiff via the signaling of the information, this model demonstrates that even an informed party can be harmed by asymmetric information.

### 2.2.3 Dynamic strategic models

Since in one-shot models pre-trial negotiation only has one period, questions of settlement timing and deadline effect can not be answered by this setting. Models with multiple bargaining periods are introduced into the research. Bargaining models have traditionally focused on situations where a buyer and seller are haggling over the price of a product (see Sobel & Takahashi (1983) and Fudenberg & Tirole (1991)). Private information can be incorporated by allowing either or both of the players to keep their true valuations of the good form the
other. One can reinterpret this environment as a settlement negotiation by, for example, supposing that the defendant is the seller with the plaintiff acting as the buyer. In this context, what would have been selling price offers in the buyer-seller game become settlement offers from the defendant with the plaintiff deciding whether to buy the good (settle the case) at the requested amount.

Ordover & Rubinfeld (1986) view the parties as being engaged in a war of attrition. Bargaining takes place over a finite horizon and there are two possible outcomes, $\alpha$ and $\beta$, preferred differently by the players. One player has information about which of these will occur should agreement not take place by the end of the game. One interpretation of this is that the plaintiff has private information about the extent of his loss; if these are high, he receives $\beta$, and if low, then $\alpha$. the defendant perpetually offers $\alpha$ (i.e. an exogenous settlement offer) but if he concedes, he settles at $\beta$. Thus, the game is decided when a player "drops out". Ordover & Rubinfeld (1986) show that the unique sequential equilibrium outcome depends on whether the defendant is initially optimistic or pessimistic about the type of plaintiff he faces.

Cheung (1988) allows the plaintiff to initiate trial by exercising an outside option to break off negotiations. It is not surprising that instant settlement generally occurs in any subgame perfect equilibrium at an amount equal to the plaintiff's expected net trial recovery.

Spier (1992) incorporates the model of Cheung (1988) into a more complete analysis of pre-trial dynamics. The model is also a dynamic extension of Bechuk (1984). The defendant is assumed to have private information about
his liability $L$. The plaintiff only knows the distribution $F(L)$. The dynamics are introduced by allowing bargaining to take place over multiple periods. The plaintiff’s rejection of offer $S_t$ in Period $t$ simply leads to Period $t + 1$, and a new offer from the defendant. However, if Period $T < \infty$ is reached, rejection of $S_T$ leads to trial.

We illustrate this model for $T = 2$. To emphasise the fact that time is now a key feature of the analysis, we assume that the defendant has an incentive to settle early because he incurs pre-trial costs $c_d$ in each period $t = 1, 2$, and we also introduce the common discount factor $\delta$. Here, the costs of trial are separated from the pre-trial costs and defined as $k_i, i = p, d$. For simplicity, we assume that $c_p = k_p = 0$. Period 2 of the model is exactly the one-shot game analysed earlier. Thus, letting $[\hat{L}_t, \bar{L}]$ stand for the support of the loss distribution perceived by the defendant at the start of Period $t$, the solution of the screening model gives us that:

$$S_2 = \delta(p\hat{L}_2 + k_d)$$

$$\hat{L}_3 = \hat{L}_2 + \frac{k_d}{p}$$

Now consider Period 1. The settlement offer here will just leave the plaintiff-type $\hat{L}_2$ indifferent between acceptance and rejection. Since the plaintiff bears no costs, this implies $S_1 = \delta S_2$. Therefore the plaintiff’s second stage acceptance level is

$$\hat{L}_2 = \frac{S_1/\delta^2 + k_d}{p}.$$
The defendant solves

\[
\min_{S_1} F'(\hat{L}_2) S_1 + c_d + [1 - F(\hat{L}_2)] \delta \left\{ \frac{F(\hat{L}_3) - F(\hat{L}_2)}{1 - F(\hat{L}_2)} + c_d \right. \\
+ \left. \frac{[1 - F(\hat{L}_3)] \delta}{1 - F(\hat{L}_2)} \left[ \int_{L_2}^\infty f(L) dL \right] \right\}
\]

Using of the Envelope Theorem, the first-order condition for \( S_1 \) is

\[
\frac{F'(\hat{L}_2)}{f(\hat{L}_2)} = \frac{c_d}{\delta p}.
\]

Employing the uniform distribution gives

\[
\hat{L}_2^* = L_d + \frac{c_d}{\delta p}
\]

Substituting this optimal acceptance level into the settlement conditions before yields

\[
\hat{L}_3^* = L_d + \frac{k_d}{p} + \frac{c_d}{\delta p}
\]

\[
S_2^* = \delta (p L_d + k_d) + c_d
\]

so that \( S_1 = \delta S_2 \) produces

\[
S_1^* = \delta^2 (p L_d + k_d) + \delta c_d
\]

These results characterise the Perfect Bayesian Equilibrium of the model. If costs are so large as to make \( S_1^* > \delta^2 L \) then the defendant offers \( S_1^* = \delta^2 L \) and settles the case immediately. When \( L_t^* \in [L_0, L] \), there is a positive probability
of settlement in each pre-trial period. In the uniform case, the probability of settlement in Period $t$ is given by $Pr(t) = \frac{(L_{t+1} - L_t)}{(L - L)}$. Thus, $Pr(1) = \frac{c_d}{\delta(L - L)}$ and $Pr(2) = \frac{k_d}{(L - L)}$. These probabilities are determined by the costs faced by the litigants as they dictate the size of the settlement offers. It is clear that the higher are the defendant’s costs, the higher will be his settlement offers and the higher will be the probability of an early resolution to the dispute.

Using a larger value of $T$, Spier (1992) demonstrates that the uniform distribution exhibits a “U-shaped” unconditional probability of settlement across time, while Fenn & Rickman (1999) show that the conditional probability is monotonic (up or down). In Spier (1992) the gradually declining portion of the “U” is generated by discounting while the final rise is due to the fact that $k_d$ may be much larger than $c_d$: the defendant avoids settling at unnecessarily generous terms until the “doors of the court” force a deadline effect. The presence of such an effect is an important product of using dynamic analysis. In one-shot models, the whole notion of delay and deadline effects is missing because failure to settle in one period simply leads to trial, not settlement in a later one. Dynamic models can solve questions about delay and the timing of settlement.

Just as bargaining theory extends past finite horizon models with one-sided information asymmetries so does litigation literature. However, it is probably fair to say that the full range of possibilities has yet to be applied. Wang, Kim & Yi (1994) analyse an infinite horizon model where the parties make alternating settlement offers (starting with the defendant), the plaintiff has
private information and, also, can exercise an outside option to go to trial whenever he rejects an offer from the defendant. Their sequential equilibrium is, interestingly, unique but of limited predictive power: the defendant’s first offer is either accepted by the plaintiff or rejected in favour of trial. Thus, although a potentially infinite number of periods is available, a game lasts a maximum of two and alternative offers are not observed in equilibrium. The empirical evidence in Fenn & Rickman (1999) suggests that two-sided information asymmetries may be needed to improve the predictive power of these dynamic models.

2.3 The English versus American Rule

In England and Wales and most European legal systems, a party who prevails in litigation is entitled to indemnification from the losing party for his costs of prosecuting the lawsuit. However, in the United States, the prevailing party is entitled to filing fees, court fees but not to recover his expenditures on lawyers’ fees. The advocates of the English rule claim that the costs it imposes on losers will discourage plaintiffs from filing meritless claims and the risk associated with trial will increase the likelihood of settlement. People also argue that the English cost rule increases total legal expenditures.

2.3.1 Effects on legal expenditures

The economic theory of litigation models litigants as rational players who seek to maximise their returns from the litigation. From this perspective, we can compare the plaintiff’s expected value of trial under the two rules. Under the
English rule, the expected value of trial is given by

\[ EU_E = pL - (1 - p)(c_p + c_d) \].

Under the American rule, since each party pays own lawyer's fees the expected value of trial becomes

\[ EU_A = pL - c_p. \]

It is clear \( EU_E < EU_A \) if and only if \( p < c_d/(c_p + c_d) \). Therefore, if litigants' legal fees are fixed, plaintiffs with low probabilities of prevailing will find their cases less valuable under English rule and vice versa. Donohue (1991) challenges the Posner/Shavell litigation model but claims that the English cost rule tends to discourage low merit cases and encourage high merit cases.

However, in reality the probability of prevailing can be a function of litigants' expenditure. If so, we can rewrite litigants' expected values of trial as

\[ EU_E = p(c_p, c_d)L - [1 - p(c_p, c_d)](c_p + c_d), \]

\[ EU_A = p(c_p, c_d)L - c_p. \]

If the litigants can choose their legal expenditures, their optimal choices are given by maximising the expected values of trial with respect to their legal expenditures. For the plaintiff, it gives

\[ p_{c_p}L + p + p_{c_p} \cdot (c_p + c_d) - 1 = 0, \]

\[ p_{c_p}L - 1 = 0. \]
Since the defendant's legal expenditure plays an important role in the above functions, it is unreasonable to expect litigants to make their expenditure decisions without considering the other side's expenditure. Naturally, now the effects of cost rules can be modelled in a two-person's game. Breautigam, Owen & Panzar (1984) first introduce Nash equilibrium in the analysis of cost rules. They find that in Nash equilibrium the sum of parties' expenditures must increase under the English cost rule. Katz (1987) subsequently confirms that fee shifting encourages greater expenditure. Plott (1987) uses a game model to illustrate the effects of the cost rules on legal expenditures. His results show that legal expenditures depend on the exact formulation of the "legal production function". If the case outcome depends on litigants' legal effort, the English rule will cause unlimited increases in legal expenditures. If the case outcome is isolated from litigants' effort, the English rule has no effect on expenditure.

2.3.2 Effects on settlement

Since settlement reduces social legal expenditure and the vast majority of civil cases are settled rather than tried, effects on settlement are an important factor in the comparison of the English and American rules. As a result, literature develops two methods to illustrate the nature of fee shifting.

In the context of the optimism model (Landes (1971) and Gould (1973)), the defendant's expected cost of trial under the English rule is

\[ EC_E = (1 - p)(L + c_p + c_d). \]
Thus, if he loses he pays the accident loss $L$ and both parties’ litigation costs, but if he wins, he incurs no costs. While under the American rule, his expected value of trial is

$$EC_A = (1 - p)L + c_d.$$  

As we argued above, settlement is feasible if the maximum amount the defendant will pay to avoid trial exceeds the minimum amount the plaintiff will accept. Therefore, under the English cost rule, the settlement condition becomes

$$(2p - 1)(L + c_p + c_d) \leq c_p + c_d.$$  

Under the American cost rule, this condition is

$$(2p - 1)L \leq c_p + c_d.$$  

The comparison of them shows that under the English rule the settlement range is smaller, which implies the English rule makes settlement harder. Hence, fee shifting stimulates litigants’ optimism, making them less likely to settle. Shavell (1982) explains this intuitively. The stakes of the case are higher under the English cost rule since the outcome of the trial reallocates legal costs. Thus, the effect of moving from the American rule to the English rule is the same as an increase in $L$. It is reasonable to predict more trials under the English rule.

However, other studies claim that trials are not caused by optimism but by uncertainty over the opponent party’s reservation settlement value. The settlement decision depends on a numbers of factors, including the stakes, the
costs of litigation and the extent of uncertainty between parties. More uncer-
tainty means less settlement. Asymmetric information models of settlement
(Bebchuk (1984) and Reinganum & Wilde (1986)) confirm the conclusion that
the English cost rule encourages trial rather than settlement in disputes re-
volving around liability. Fee shifting actually leads parties to toughen their
overall bargaining position, lowering the probability of settlement. Polinsky
& Rubinfeld (1998) indicate that the English rule lowers the average quality
of trial cases because the marginal parties in trial have less favourable private
information than under the American rule.

2.3.3 Evidence on the effects of fee shifting

Ideally, the effects of fee shifting should be tested by litigation and settlement
data from the United State and England. However this is not possible in prac-
tice because it would be unable to control all the inter-jurisdictional factors
that may influence the settlement decision. Stanley & Coursey (1988) test
the effects of fee shifting within an experimental setting. They find that the
English rule increases the settlement rate. An explanation of this result is that
the litigants are risk averse.

There is some more convincing empirical evidence from the data of the State
of Florida, where the English rule was used for medical malpractice cases
between 1980 and 1985. In two studies (Snyder & Hughes (1990) and Snyder
& Hughes (1995)), Snyder and Hughes use data from more than 10000 cases
to test the effects of fee shifting. They find, firstly, the English rule increases
the likelihood of trial; secondly, the English rule discourages weak claims;
thirdly, the English rule increases the prevailing rate of plaintiffs as well as the judgement at trial and amount of compensation in settlement. These findings are consistent with theoretical predictions and provide further evidence that the English rule encourages plaintiffs to pursue higher quality claims.

2.4 Principal-agent issues and legal fee arrangements

In the previous sections, we assume an identity between the interests of the client and his lawyer. However, this may be not true. Since many clients are “one-shot” users of the legal system, as demonstrated by Genn (1987), lawyers often act for poorly informed clients with high monitoring costs. Consequently, the general problems of principals and agents may arise in the context of litigation. Merits of the cases, clients’ legal expertise knowledge, fee arrangements and their links to outcomes of lawsuits may independently or jointly motivate or mitigate principal-agent problems.

In this section, we review the literature on principal-agent problems between lawyers and clients. Two sets of questions are interesting to us. First, which factors will affect the lawyer’s effort decision and what is the role of fee arrangements in the lawyer’s legal effort? Second, what are the effects of fee arrangements on the client’s and the lawyer’s settlement decisions? Therefore, in addition to the general principal-agent settings in litigation, in this section our vision mainly focuses on the studies giving comparisons among hourly fees, contingent fees and conditional fees.
2.4.1 The lawyer’s effort decision

Early principal-agent models in litigation normally examined lawyers’ legal efforts by comparing them under contingent fees and under hourly fees. They assume a judicial production function which maps the plaintiff’s lawyer’s hours on the case into an amount which this will recover for the plaintiff. The relevant question is whether hourly or contingent fees can induce effort to maximise the plaintiff’s net benefits from litigation.

Schwartz & Mitchell (1970) is the first to analyse lawyer’s agent problems by comparing fee arrangements. They suppose the plaintiff and his lawyer are risk neutral profit maximisers, and that the market for legal services is perfectly competitive. Under both fee arrangements there is a judicial production function $S$ specifying the gross recovery as an increasing, concave, deterministic, function of the lawyer’s hours $h$. It is implicitly assumed that the lawyer puts the same effort into each hour worked.

Now consider two cases. In the first, the plaintiff can observe $S(h)$ and can therefore specify the hours that the lawyer should work. The authors assume this to mean that he chooses hourly fees. In the second case, the plaintiff cannot observe $S(h)$. This setting introduces asymmetric information on lawyer’s effort. Therefore, the model can focus on whether the financial incentive of contingent fees can overcome the information asymmetry. The two cases can be compared as follows: with observable $S(h)$ and hourly fees, the plaintiff chooses $h$ to maximise $S(h) - wh$, where $w$ is the lawyer’s competitively determined
wage rate. The first-order condition is:

$$\frac{dS(h)}{dh} = w$$

Therefore, the lawyer’s gross marginal product should equal his marginal cost. Turning to the second case, assume that the contingent fee percentage is $\beta \in (0,1)$. The lawyer chooses $h$ to maximise $\beta S(h) - wh$. Here $wh$ represents her opportunity cost. The first-order condition is:

$$\frac{\beta dS(h)}{dh} = w$$

Since $S(h)$ is concave and $\beta < 1$, it is clear that under hourly fees the lawyer’s effort is higher than it under contingent fees. This also implies that both the plaintiff’s recovery and the lawyer’s fee are lower with a contingent fee. In addition, $w$ can observe that if and only if $\beta = 1$, these two fee arrangements reach the same effort level. Actually, these results are analogous to the traditional views that shared contracts in general are inefficient since they induce suboptimal inputs.

Johnson (1981) considers the lawyer’s expertise problem: if the plaintiff is ill-informed about the case’ merit, how will fee arrangements affect the lawyer’s effort? Under this situation, the lawyer can use her information advantage to maximise her expected income regardless of the plaintiff’s interest. Under hourly fees, the lawyer chooses $h$ to maximise her fee $wh$, while under contingent fees the lawyer chooses $h$ to maximise $S(h) - wh$. The result suggests that the lawyer may over-invest her time under hourly fees. This implies that the ill-informed plaintiff may be better off if he chooses contingent fees.
Danzon (1983) adopts the model of Schwartz & Mitchell (1970) but assumes that contingent fees contracted lawyers compete on the basis of the recovery they gain for their clients, rather than the share of recovery. In addition, the author assumes the probability of the plaintiff prevailing $p$ and the gross recovery $A$ are associated with both parties' legal effort. Therefore, the judicial production function becomes:

$$S = p(L, H)A(L, H)$$

where $L$ is the plaintiff lawyer's hours on the case and $H$ is the defendant lawyer's hours. The relationships between hours and production are given by

$$\frac{\partial p}{\partial L} = \frac{\partial A}{\partial L} > 0, \frac{\partial A}{\partial H} > 0$$

Now under contingent fees, given the defendant's optimal input $H$, the plaintiff's lawyer selects $L$ and $\beta$ to maximise her profit function

$$\phi = pA(1 - \beta) + \lambda(\beta pA - wL)$$

where $\lambda$ is the Lagrange multiplier associated with the lawyer's opportunity cost constraint. Differentiating with respect to $L$, $\beta$ and $\lambda$, and substituting the results, we can get:

$$\frac{d(pA)}{dL} = w.$$ 

This result is identical to the hourly fees condition of Schwartz & Mitchell (1970). Therefore, the author concludes that with risk neutral plaintiffs and lawyers, contingent fees induce the amount of legal effort that would be chosen by a fully informed hourly fees contracted plaintiff.
Halpern & Turnbull (1983) introduce uncertainty into the principal-agent framework. Assuming the judicial production function $S$ is associated with a random factor $\epsilon$, the study concludes that contingent fees dominate hourly fees, in terms of maximising the plaintiff’s expected utility, when he is unable to monitor effort or observe the uncertainty *ex post* given he is not risk neutral when his lawyer is risk averse. Hourly fees are only optimal when there is no uncertainty and the case is sufficiently simple that monitoring is feasible. Halpern & Turnbull (1983) also look at the effects of uncertainty as exogenous parameters change. They show that neither the plaintiff nor the lawyer will put more effort into the case under uncertainty than under certainty, but that both will invest more time as the probability of winning in court rises. Wealthy risk averse lawyers devote more time to a contingent fee case than less wealthy ones, while the effects of the plaintiff’s wealth on his preferred choice of effort depends also on his risk aversion. For both the plaintiff and the lawyer, the effects of a mean preserving spread of the settlement function on their investments depend on their risk aversion.

Dana & Spier (1993) and Emons (2000) also focus on the lawyer’s expertise problems. They both assume the plaintiff is ignorant but in different ways. Following Schwartz & Mitchell (1970), they use the lawyer’s service hours to represent her legal effort. Dana & Spier (1993) assume the plaintiff does not know the merit of his case. The lawyer as the expert finds out about the merit and then recommends whether to pursue or drop the case. They find that contingent fees provide sufficient effort but hourly fees do not. Two implications are also highlighted. First, under conditional fees since the lawyer has a finan-
cial stake in the case she is willing to drop suits with a low expected return. Therefore, contingent fees may reduce the proportion of frivolous lawsuits. Second, in a world without contingent fees, injured parties have good reason to distrust lawyers and may be deterred from seeking legal services. Emons (2000), in contrast, assumes that the plaintiff knows the merit of the case and can observe how much effort the lawyer puts into his case. But the plaintiff does not know how much effort he needs. The effort decision is actually made by the lawyer not by the plaintiff. However, since the effort is verifiable, the lawyer can not cheat by collecting fees for services she did not provide. The author concludes that paying the lawyer hourly fees provides better incentives in this expertise problems than paying contingent fees. In summary, these two papers imply that if the lawyer decides whether to proceed or drop the case, contingent fees are more efficient, while if the lawyer decides how much effort to input, hourly fees are more efficient. In addition, both papers imply that in expertise problems neither contingent fees nor hourly fees are generally optimal.

Rubinfeld & Scotchmer (1993) introduce a two-type asymmetric information model. They assume that the plaintiff has better information about the qualities (merits) of the case and that the lawyer has better information about her quality (ability). The authors observe that plaintiffs with high-quality case will be willing to pay a high fixed fee and a low contingency percentage, while the plaintiff with low-quality case will be willing to pay a low fixed fee and a high contingency percentage. While a high-quality lawyer will signal her ability by working for a high contingency percentage. However, since high-quality cases are more likely to be won than low-quality cases and since a high-quality
lawyer is more likely to win the same case than a low-quality lawyer, the paper does not give a firm conclusion on which of these asymmetric information is more important.

Empirically, Kritzer, Felstiner, Sarat & Trubek (1985) use the data collected by the US Civil Litigation Research Project to compare lawyers' behaviours between hourly fees and contingent fees. They find that fee arrangements do influence the amount of effort lawyers devote to a given case. For small stake cases, compared to contingent fees, hourly fees encourage higher effort. However, the paper also suggests that there is no significant fee effect on high stake cases.

2.4.2 Agency problems associated with conditional fees

Gravelle & Waterson (1993) uses a one-shot model to analyse legal fees' effects on settlement, accident and welfare. In this asymmetric information model, the plaintiff has private information about the level of damages. Specifically, in the model all the participants (plaintiff, defendant and lawyer) are risk neutral. The accident probability \( \pi \) is endogenous which depends on defendant's pre-accident care level \( x \). Since both litigation and care are costly to the defendant, he chooses an optimal care level to minimise his expected total costs. If an accident occurs, the damage to the plaintiff is \( L \in [L_0, L_1] \), but the defendant only knows the distribution of the damage \( Q(L) \). The plaintiff can be ignorant but his lawyer is not altruistic. When the lawyer makes decisions, she attaches a weight \( \lambda \) on the plaintiff's income and \( 1 - \lambda \) on her own income. \( \lambda \) therefore represents the lawyer's degree of altruism/selfishness. The lawyer's
fees are given by $f^S$ if the case is settled and $f^w$ ($f^0$) if it is won (lost) at court. The defendant makes a single settlement offer $S$.

Within this framework, the plaintiff will accept the defendant’s settlement of if and only if

$$S - f^S \geq p(L - f^w) - (1 - p)f^0 + t,$$

where $p$ is his probability of prevailing at trial and $t = k[p_c - (1 - p)c_d]$ is the expected cost transfer where $k = 1$ ($k = 0$) represents the English (American) cost rule. It is clear that the settlement offer has a marginal level of acceptance, which is

$$\ell^P = f^w + \frac{S - f^S - t + (1 - p)f^0}{p} \geq L.$$

$\ell^P(S, \cdot)$ is defined as the plaintiff’s acceptance level.

The plaintiff’s lawyer, if selfish, would accept the settlement offer if

$$f^S - c_0 \geq pf^w + (1 - p)f^0 - c_p,$$

where $c_0$ is his cost of settlement and $c_p$ is his total cost. When $f^S - c_0 = pf^w + (1 - p)f^0 - c_p$, the lawyer’s acceptance level $\ell^A$ can be solved. There is a potential conflict of interest over settlement because $\ell^P \neq \ell^A$. The probability that there is an actual conflict of interest is $Q(\ell^P) - Q(\ell^A)$. Combine the plaintiff and his lawyer’s settlement conditions together, it becomes

$$\lambda(S - f^S) + (1 - \lambda)(f^S - c_0) \geq \\
\lambda(p(L - f^w) - (1 - p)f^0 + t) + (1 - \lambda)(pf^w + (1 - p)f^0 - c_p).$$
Under hourly fees, $f^S = c_0$, $f^w = f^0 = c_p$. Under conditional fees, $f^S = (1 + \mu)c_0$, $f^w = (1 + \mu)c_p$, and $f^0 = 0$. Under contingent fee, $f^S = \alpha S$, $f^w = \alpha L$, and $f^0 = 0$. Substitution of these specified fee values into the combined settlement condition functions enables the comparison of acceptance level across different fee arrangements. Also, the conflict of interest which fee arrangements might create can be examined. Under hourly fees, the lawyer receives a non-contingent fee which just covers her costs whatever the outcome of the litigation. Therefore she has no financial incentive to offer biased advice to the plaintiff. Hence, the plaintiff’s acceptance level under hourly fee $\ell_H$ is not affected by the lawyer’s degree of selfishness ($\lambda$). While under a contingent fee, the degree of selfishness does affect the acceptance level. Under the English cost rule, since the costs can be shifted in both direction, it is possible that the expected net transfer is $t < 0$. The combined effect of fee shifting and contingent fee makes a well informed plaintiff less willing and a selfish lawyer more willing to settle. The acceptance level $\ell_\alpha$ is less than under the hourly fee if and only if the lawyer is comparatively altruistic $\lambda > 1/2$. If the lawyer is selfish $\lambda = 0$, since the lawyer has shared risk at trial he is keener to settle, which gives $\ell_\alpha > \ell_H$.

Compared with the hourly fee, the conditional fee increases the plaintiff’s costs by $\mu c_0$ if the settlement offer is accepted and by $[\mu(1 + \mu) - 1]c_p$ if it is rejected. Accordingly, the lawyer makes a profit of $\mu c_0$ if the offer is accepted with probability $Q$, which implies that, if the lawyer makes an expected profit of zero, she must make an expected loss if the offer is rejected. Hence, compared with the hourly fee the conditional fee makes a well informed plaintiff ($\lambda = 1$) less willing to accept any given settlement offer and makes the lawyer better off.
if the offer is accepted than if it is rejected. This situation is similar to the contingent fee, the acceptance level $\ell_\mu$ depends on the selfishness of the lawyer. When the lawyer is relatively selfish $\lambda < 1/2$, $\ell_\mu > \ell_H$, and when the lawyer is relatively altruistic $\lambda > 1/2$, $\ell_\mu < \ell_H$.

The defendant chooses his settlement offer against the costs incurred by different fee arrangements. Of course, the value of the settlement offer depends on the acceptance level. To capture more features of fee arrangements, in the model the probability of accident is set as endogenous. The authors show that since increases in the plaintiff's acceptance level lower the defendant's settlement offer and so lower the defendant's expected post-accident costs, a higher acceptance level cause more accidents. In contrast to early views\(^2\) that the conditional fee and the contingent fee will lead to an increase in litigation because plaintiffs will be more likely to sue and less likely to settle, Gravelle & Waterson (1993) argues that the effects of fee changes on the number of potential suits and the likelihood that a suit will go to trial work in offsetting directions. The authors point out two implications. First, it is impossible to predict whether there will be more or fewer trials. Second, the welfare consequences of changes in the number of trials are ambiguous. An increase in the number of trials could be compatible with an increase in welfare if it is achieved by a reduction in the number of accidents more than offsetting the plaintiff's reduced willingness to settle. Therefore, for any fee arrangement, it may be impossible to achieve both a reduction in the volume of litigation and in the number of accidents.

\(^2\)eg see Contingency fees, Lord Chancellor’s Department, CM. 571, LCD (1989) for reference.
Emons & Garoupa (2006) compare conditional fees and contingent fees in a principal-agent framework where the lawyer chooses unobservable effort after she learns the realization of accident loss. Unlike Gravelle & Waterson (1993), Emons & Garoupa (2006) do not consider the interactions between plaintiff and defendant and consequently there is no settlement stage in their model. The model has two stages. In stage 1, the plaintiff and the lawyer sign the contract. Neither lawyer nor plaintiff knows the realization of the accident loss $L$. After the lawyer has accepted the contract, she learns the realization $L$. In stage 2, the lawyer decides her legal effort and payoffs are realized with the outcome of the case. Both players are risk neutral. In the model, the probability of prevailing at trial ($p$) depends on the lawyer’s unobservable costly effort $e \in [0, 1]$.

Within this framework, the contingent fee contract $S$ and the conditional fee contract $K$ are described alternatively by

$$S = \begin{cases} 
  w + \alpha L & \text{if the case is won;} \\
  w & \text{if the case is lost.}
\end{cases}$$

$$K = \begin{cases} 
  w + d & \text{if the case is won;} \\
  w & \text{if the case is lost.}
\end{cases}$$

where $w$ is a fixed component, $\alpha$ is the lawyer's share of judgement and $d$ is the uplift fee which is not related to the judgement.

In the asymmetric information setting, the lawyer knows $L$ at the time of choos-
ing effort but the plaintiff does not. Under contingent fees, the lawyer maximises \( p(e)\alpha L - e + w \) with respect to \( e \). The choice of effort satisfies \( p(1) = 1 \).

Under conditional fees, the lawyer maximises \( p(e)d - e + w \); then the optimal effort is \( p(1)d = 1 \). It is clear that under contingent fees the lawyer’s effort \( e \) is a function of \( L \), but under conditional fees the effort is independent of \( L \).

If we let \( p(e) = e^\gamma \), these two efforts become \( e_S = (\gamma \alpha L)^{1/(1-\gamma)} \) and \( e_K = (\gamma d)^{1/(1-\gamma)} \).

The plaintiff maximises his expected utility \( E(U_S) = E(p(1 - \alpha)L) - w \) or \( E(U_K) = E(p(L - d) - w \) subject to the lawyer’s effort. If \( w \geq 0 \), under contingent fees his expected utility \( E(U_S) = (1 - \gamma)\gamma^{2\gamma/(1-\gamma)} E(L^{1/(1-\gamma)}) \) and under conditional fees \( E(U_K) = (1 - \gamma)\gamma^{2\gamma/(1-\gamma)} E(L^{1/(1-\gamma)}) \). Using Jensen’s inequality, \( E(U_S) > E(U_K) \). Hence, the plaintiff and the lawyer do better under contingent fees than under conditional fees. Similar analysis for the scenario where constraint \( w < 0 \) is also given. The paper concludes that contingent fees provide better incentives than conditional fees. In addition, conditional fees do better than hourly fees and flat fees. However, it is arguable that in the paper’s setting, the conditional fee uplift \( d \) is a fixed amount. Actually, \( d \) should be a function of the lawyer’s service hours (effort). Moreover, the paper puts the UK style conditional fees into an American cost rule environment. In the next subsection, we provide an amended version of the model.

Emons (2007) changes the assumption of that the client is uninformed (in Emons & Garoupa (2006)) to one where the lawyer is uninformed, which means the accident loss \( L \) is known to the client but not to the lawyer. The loss here is a function of two factors, the distribution/level of the loss and the risk of the case. Therefore, asymmetric information can either be the expected level of loss or the risk of the case. There are three stages in the game. In the
first stage the lawyer offers a contract: either a conditional fee or a contingent fee contract. In the second stage the client chooses either one contract from the two on offer or no contract at all. In the third stage the lawyer picks her effort. The client maximises the expected difference between judgement and payments to the lawyer. The lawyer maximises her expected income minus effort cost. In conclusion, if there is asymmetric information about the expected level of loss, in equilibrium the lawyer will offer only conditional fees, while if there is asymmetric information about the risk of cases, only contingent fee contracts are offered in equilibrium.

Emons (2006) compares conditional and contingent fees in a framework where lawyers choose between a safe and a risky litigation strategy. Two results are highlighted in the paper. First, conditional fees give the lawyer an incentive to maximise the probability of winning the case. Under contingent fees the lawyer maximises the expected judgement. Second, if the plaintiff is risk averse, there may be a conflict of interest between the plaintiff and his lawyer. If the cost of hiring a lawyer is low, the plaintiff seeks insurance through conditional fees which induce the safe bet. Accordingly if the legal fees are high, the plaintiff prefers contingent fees shifting most of the judgement risk to the lawyer. For the jurisdiction where conditional fees are allowed but contingent fees are forbidden, the author predicts inefficient contracting for high costs of legal service.
2.4.3 Extensions to Emons and Garoupa (2006)

Emons and Garoupa (2006) give a comparison between US-style contingent fees and UK-style conditional fees on an unobservable legal effort basis. In this subsection, we focus on two extensions of their analysis. First, we consider the situation when English cost rule apply to the UK-style conditional fees arrangement. Second, we assume the conditional fee is a function of the lawyer's legal effort, which tends to be true.

2.4.3.1 English cost rule

A plaintiff is involved in an accident. He retains a lawyer to sue the defendant to demand damages $L$. The probability of winning ($p$) depends on the lawyer's legal effort $e \in [0, 1]$. Following Emons and Garoupa (2006), we define $p(e) = e^\gamma$, $\gamma \in (0, 1)$. The effort $e$ is unobservable. When the case is won, the plaintiff gets $L$ from the defendant whereas he gets nothing when the case is lost. The amount of adjudication $L$ is the realization of a random variable with support $[0, 1]$, cumulative density function $G$, and expected value $E(L) \in (0, 1)$.

The timing of events is as follows. In the first stage, the plaintiff and the lawyer sign the contract. In this stage, neither of them knows the realization $L$. In the second stage, the lawyer learns the realization $L$. In the third stage, the lawyer chooses her legal effort $e$.

The contingent fee and the conditional fee are defined as:
Definition 2-4-1: A contingent fee contract $S$ is described by a fixed component $w$ plus a percentage $\alpha$ of the adjudicated amount $L$ if the case is won. Formally,

$$S = \begin{cases} 
  w + \alpha L & \text{if the case is won;} \\
  w & \text{if the case is lost.}
\end{cases}$$

Definition 2-4-2: A conditional fee contract $K$ is given by a fixed component $w$ plus an upscale fee $d$ not related to the adjudicated amount $L$ if the case is won. Formally,

$$K = \begin{cases} 
  w + d & \text{if the case is won;} \\
  w & \text{if the case is lost.}
\end{cases}$$

Assume the defendant’s legal cost is a fixed value $f^D$. We apply the English cost rule to the conditional fee. Here the plaintiff’s expected utility becomes

$$U_K = p(L - d) - w + k[pd - (1 - p)f^D],$$

where $k$ is proportion of costs shifted from loser to winner. Since the payment contract to the lawyer does not change, the effort incentive of the conditional fees does not change either. The ex post efficient level of effort satisfies

$$p\gamma(L + kf^D + kd) = 1$$

or in a closed form

$$e^* = \frac{[\gamma(L + kf^D + kd)]^{1/(1-\gamma)}}{1},$$

Compared with the contingent fee where $e = (\gamma L)^{1/(1-\gamma)}$, the ex post efficient effort level of the conditional fee is higher.

Now we consider the scenario where a constraint $w \geq 0$ exists. Without this constraint we have to solve the problem by finding a fixed salary that solves the participation constraint with equality when $\alpha = 1$ and $d = E(L)$ for contingent and conditional fee contracts respectively. Therefore, the fixed salary
is negative. We now solve the problem for the plaintiff by set \( w = 0 \) so that both contingent and conditional fee contracts only have variable components.

We consider \( w = 0 \). The the plaintiff maximises \( E(U_K) \) subject to \( p_d d = 1 \). The solution is \( d = \left[ \frac{p_k}{(1 - k)} \right]^{\frac{1}{1 - k}} \). When \( k = 1 \), \( d \) goes to infinite. This happens because in the model setting, the probability of winning (\( p \)) is actually an increasing function of the upscale fee \( d \). The higher the \( d \), the higher the chance to win. So the plaintiff does not need to consider the risk of losing in trial under the English cost rule. This result implies a limitation in the assumption: there is no upper bound on the effort. In reality, it is unreasonable that a lawyer inputs infinite effort into a single case. Hence, the function of the probability of winning \( p(e) = e^\gamma \) needs to be changed. In addition, this result also suggests that the probability of winning \( p \) should contain input variables from both the plaintiff and the defendant. These issues can be an interesting topic for future research.

### 2.4.3.2 Effort-related conditional fees

In this subsection, we go back to the assumption of Emons & Garoupa (2006) that American cost rule is applied to the both fee arrangements. Unlike the setting in Emons and Garoupa (2006), here we assume the effort \( e \) can be observed since the lawyer’s payment may rely on it. More precisely, we assume the lawyer’s legal effort is the time she spends on the case. In the final stage, the trial finishes and the financial terms of the contract are settled.

Therefore, the definition of the conditional fee becomes:
Definition 2-4-3: A conditional fee contract $K$ is given by a fixed component $w$ plus a upscale fee $de$ not related to the adjudicated amount $L$ if the case is won. Formally,

$$
K = \begin{cases} 
  w + de & \text{if the case is won;} \\
  w & \text{if the case is lost.}
\end{cases}
$$

Under contingent fees, the expected utility of the risk neutral lawyer given $L$ is $V_S = p(e)\alpha L - e + w$ and the expected utility of the risk neutral plaintiff is $U_S = p(e)(1 - \alpha)L - w$. Under conditional fees, the expected utility of the risk neutral lawyer given $L$ is $V_K = p(e)de - e + w$ and the expected utility of the risk neutral plaintiff is $U_K = p(e)(L - de) - w$.

We go to the situation where the lawyer knows $L$ at the time of choosing effort but the plaintiff does not. Under contingent fees, the lawyer maximises $V_S$ with respect to $e$. The choice of effort will satisfy $p_e\alpha L = 1$ or in closed form $e_S = (\gamma \alpha L)^{1/(1-\gamma)}$. Under conditional fees, the lawyer maximizes $V_K$ with respect to $e$. The choice of effort will satisfy $p_e de + pd = 1$ or in closed form $e_K = [(\gamma + 1)d]^{-1/\gamma}$.

Again, we consider the situation that the lawyer cannot buy the case from the plaintiff where $w \geq 0$, which is the second scenario of Emons and Garoupa’s paper. Assume $w = 0$, it the case of “no win, no fee”. Under contingent fees, the plaintiff maximises $E(U_S)$ subject to $p_e\alpha L = 1$. The expected payoff for
the plaintiff is

\[ E(U_S) = (1 - \gamma)\gamma^{2\gamma/(1-\gamma)}E(L^{1/(1-\gamma)}). \]  

(2.1)

whereas the lawyer gets \( E(V_S) = \gamma E(U_S) \).

Under conditional fees, the plaintiff maximizes \( E(U_K) \) subject to \( p_d e + p_d = 1 \). The optimal solution is \( d = [E(L)\gamma]^{\gamma/(\gamma-1)}(\gamma + 1)^{1/(\gamma-1)} \) and the expected payoff for the plaintiff is

\[ E(U_K) = (1 - \gamma)\gamma^{\gamma/(1-\gamma)}(1 + \gamma)^{\gamma/(1-\gamma)}E(L)^{1/(1-\gamma)}. \]  

(2.2)

whereas the lawyer gets \( E(V_K) = \gamma E(U_K) \) since \( de = \gamma E(L) \).

This result is slightly different from the Proposition 1 of Emons and Garoupa. Since \( E(L^{1/(1-\gamma)}) > E(L)^{1/(1-\gamma)} \) the welfare comparison is actually ambiguous. However, when \( \gamma \) is small enough there is a regime where both the plaintiff and the lawyer are better off under conditional fees than under contingent fees.

2.5 The role of legal expenses insurance

Compared to the American cost rule, the English cost rule imposes more risk on litigants. As a market response, the majority of European jurisdictions have well-developed insurance markets where protection against the risk of legal expense can be purchased. In England and Wales, although the market for
such legal expenses insurance has developed slowly\textsuperscript{3}, this position is changing as policy makers look to substitute private insurance for the increasingly expensive social insurance against legal expense provided by legal aid. Although Europe institutionally emphasizes legal expenses insurance, very few papers study it. The majority of literature still focuses on contingent fees.

van Velthoven & van Wijck (2001) analyse legal expenses insurance in a jurisdiction where the English cost rule is applied. In their setting, both the plaintiff and the defendant are risk neutral and information is complete. The paper focuses on whether insurance will change litigants’ decisions, and whether profit-seeking companies will make the insurance available. It finally discusses the implications for social welfare. The analysis starts from the standard litigation model. For an un-insured plaintiff, the expected value of trial is

\[ EU_p = p_p L - (1 - p_p)(c_p + c_d). \]

Given the plaintiff knows the probability of prevailing \( p \), if and only if \( p \geq (c_p + c_d)/(c_p + c_d + L) \), will he litigate. For the defendant, the expected cost of litigation is

\[ EU_d = (1 - p_d)(L + c_p + c_d). \]

He will pay the plaintiff by way of settlement an amount \( S = (1-p_d)(L+c_p+c_d) \) if the plaintiff has all the bargaining power. If the transaction costs associated with a settlement are zero, the only acceptable settlement offer for the plaintiff is \( S \geq p_p L - (1 - p_p)(c_p + c_d) \) i.e \( 1 + (c_p + c_d)/(c_p + c_d + L) \geq p_p + p_d \).

\textsuperscript{3}see Rickman & Gray (1995) and Prais (1995) for early reviews.
If the plaintiff is insured, his expected value of trial becomes

\[ EU_p = p_p L. \]

Accordingly, the condition for the plaintiff to litigate becomes \( p_p \geq 0 \). Now the acceptable settlement offer for the plaintiff becomes \( S \geq p_p L \) and the condition for the defendant to opt for a settlement becomes \( (1 - p_d)(c_p + c_d + L) \geq S \) (i.e. \( p_d + p_p L/(c_p + c_d + L) \leq 1 \)). It is clear that the effects of the legal expenses insurance are: first, to encourage litigation, and second, to decrease the probability of settlement. The paper also suggests that, in the insured case, the defendant will more often avoid the accident since he faces higher expenses following from this accident (i.e. the insurance deters). In welfare discussions, the authors point out the insurance increases social welfare if and only if the welfare gain stemming from increased deterrence outweighs the welfare loss due to an increase in the number of trials.

van Velthoven & van Wijck (2001) is the first research to look into the relationship between legal expenses insurance and social welfare. The results also unveil some important features of legal expenses insurance. However, it neither looks the legal expenses insurance in a "strategic" way nor discusses pre-trial negotiations in detail. This may limit applications of their results.

Kirstein (2000) starts a strategic analysis to capture some of these features of legal expenses insurance. The litigation game is divided into three stages. The first stage is the insurance stage. In this stage the plaintiff and the defendant simultaneously decide whether to buy legal expenses insurance or not. The
parameters in the insurance contract are treated as exogenous. The second stage is the accident stage. Since the probability of accident \( \pi \) is exogenous, "nature" decides the plaintiff's accident loss \( L \). The third stage is the litigation stage. In this stage the parties seek to negotiate a settlement. If no settlement is reached, the plaintiff has to decide whether to proceed to trial or not. In the case of trial, the judge decides with probability \( p = p_p = p_d \) in favour of the plaintiff. From the first stage, there are four subgames: both parties insure, no party insures and only one party insures (two subgames). Following backward induction, the subgame perfect Nash equilibrium is solved. The findings show that if the plaintiff is not insured, the threat to sue is non-credible and thus the defendant is not motivated to make a positive settlement offer. In this case, legal expenses insurance provides a credible threat for the plaintiff and thereby induces a settlement. If the plaintiff is insured, the parameters (insurance premium and legal fee deductible) can be such that the insurance is attractive for litigants in order to improve their settlement position. It also implicitly suggests that insurance institutions do not only serve to solve problems of risk-allocation, but also serve strategic goals, such as improving one's position in settlement negotiations.

Inspired by Kirstein (2000), Kirstein & Rickman (2004) examines a contingency-style insurance arrangement with risk neutral litigants in an English cost rule jurisdiction. In this complete information strategic model, only the plaintiff can access the insurance. The model consists of three stages. In stage 1, the plaintiff and the insurer bargain over an insurance policy. Here, the insurance premium is exogenous. In stage 2, the plaintiff and the defendant negotiate over a settlement. In stage 3, if no settlement has occurred, the
plaintiff decides whether to proceed to trial or not. Unlike Kirstein (2000) but like van Velthoven & van Wijck (2001), here the probabilities of prevailing at the trial are not identical across litigants ($p_p \neq p_d$). Obviously, from stage 2 there are two subgames: insured plaintiff and un-insured plaintiff. Since the analysis focuses on the incentive effects of the insurance on litigating, settlement and going to trial, a comparison between these two subgames is given.

In the un-insured subgame, (1) the plaintiff refuses to settle and proceeds to court if and only if $p_p > p_d + \left(\frac{c_p + c_d}{c_p + c_d + L}\right)$, (2) the plaintiff and the defendant agree upon a settlement out of court for $S$ if and only if \( (c_p + c_d)/(c_p + c_d + L) < p_p < p_d + (c_p + c_d)/(c_p + c_d + L) \), and (3) the plaintiff drops the case if and only if \( (c_p + c_d)/(c_p + c_d + L) > p_p \).

In the insured subgame, (1) the plaintiff proceeds to court if and only if $p_p > p_d(c_p + c_d + L)/L$, (2) the plaintiff and the defendant agree upon a settlement out of court for $S_T$ if and only if $p_p < p_d(c_p + c_d + L)/L$, and (3) if settlement occurs, then $S_T > S$.

In addition, settlement before insurance (after-the-event insurance), predetermined shares between the insurer and the plaintiff (exogenous insurance premium), and optimism of the litigants are discussed.

Kirstein & Rickman (2004) emphasize that legal expenses insurance is necessary to provide protection against the extra cost risk imposed by the English cost rule. The findings highlight two points. First, legal expenses insurance adds credibility to the threat to sue, since it becomes profitable for a plaintiff to threaten trial. Second, by protecting the plaintiff against cost, the insurance increases settlements in the event of a negotiated settlement of the case. The authors also point out that the insurance does not increase the likelihood of going to trial since it is only of mutual benefit to the plaintiff and the insurer.
when the case settles out of court. Like Kirstein (2000), the model assumes that litigants have no means to influence the probability of accident, so the result excludes any precautionary effect on the insurance decision.

Heyes et al. (2004) introduce risk aversion to modeling pre-trial behaviour with legal expenses insurance. The analysis focuses on settlement behaviour, care decisions, the number of accidents, the volume of trials and the plaintiff’s insurance purchase decision. The model is similar to Gravelle & Waterson (1993), but here the defendant makes a settlement offer when uninformed about the plaintiff’s degree of risk aversion. The paper confirms that legal expenses insurance hardens the plaintiff’s negotiating stance and increases the defendant’s level of care but finds other variables such as settlement probability, the probability of an accident, and the probability of trial will depend on the level of the plaintiff’s risk aversion. Like in other litigation models, the effects of insurance on welfare are still ambiguous. This ambiguity is enhanced by the potentially delicate relationship between the plaintiff’s risk aversion and the activities comprising the litigation process.

2.6 Studies on health care insurance

In Chapter 1, we identified the interactions between the insurer, the client and the service provider in a legal expenses insurance system. In fact, the issues are often analogous to those appearing in insurance-based health care contexts. In both situations, a three-way relationship emerges between principal, agent and insurer. The agent (client/patient) buys insurance to protect against a risky loss (legal/health costs) and engages a principal (lawyer/physician) to
supply expertise in terms of hours worked and effort. While the former can be observed, and monitored by the agent; the latter cannot be. Thus, there is an incentive problem between principal and agent, and also a monitoring problem for the ultimate payer, the insurer. Ma & McGuire (1997) consider appropriate contracting arrangements under these conditions for US health care and Bowles & Rickman (1998) note the potential for analogous work in the legal context. In this section, we will first illustrate similarities and differences between health care insurance and legal expenses insurance. Then, we will review some studies on health case insurance.

2.6.1 Health care insurance and legal expenses insurance

In Chapter 1, we discussed the three-way relationship in the legal insurance system (see Figure 1.2). A similar situation actually exists in many health care systems, where the doctor (the service provider), the patient (the client), and the insurer\(^4\) interact in a framework of a three-way relationship. The similarities between legal insurance and health care are as follows. First, status-based insurance is missing in both systems. In health care markets, it is clear that if the insurance premium can be contingent on the individual’s state of health, the insurance policy will be (first-best) efficient (Arrow 1963). Then, this policy can protect the individual from the risk of illness \textit{ex ante} and retains incentives for the patient to utilise health care efficiently \textit{ex post}. However, since health status is too costly to verify, this policy actually does not exist in the market. Similarly, in the legal expenses insurance market, the status

\(^4\)More generally, in health care a third party payer may fund the treatment. For example, the NHS in UK and the social insurer in some European countries.
of a client is also difficult to verify. Even in the after-the-event (ATE) insurance market\(^5\), since the litigant may still have some private information (e.g. the merit of the case), the insurance premium cannot entirely be based on the status of the client. Second, the lack of status-based policy further rules out any policy that commits certain amounts of service contingent on status. In the health care market, the quantity of treatment is not contractible even \textit{ex post}. In the legal insurance market, insurance coverage of legal fees depends on the amount of lawyers's hours which cannot be specified in an insurance policy. Third, in both insurance markets, verifying the quantity of the provider's service is costly and difficult for the insurer. Thus the payment contracts are based on the provider's reported quantities which may be different from the actual quantity. Distinguishing between a reported and actual quantity reveals an incentive problem. If the client (patient or plaintiff) bears some cost, he has an incentive to ask the provider (doctor or lawyer) to under report the quantity. Truthful reporting thus translates into restrictions on insurance-payment system in both insurance markets. Fourth, effectiveness of the service provider's input is non-contractible. In both health care and legal insurance markets, payment contracts based on effectiveness of quantity are missing. Therefore, when designing an optimal system, there must be certain incentives to mitigate this market failure.

Of course, the legal expenses insurance market has some unique features. The differences between legal expenses insurance and health care are mainly due

\(^5\)There are two kinds of legal expenses insurances in market: before-the-event insurance (BTE) and after-the-event insurance (ATE). The difference between them is the timing of purchasing the insurance policy. If purchasing before the accident, it is BTE, otherwise it is ATE.
to three aspects. First, the legal system is more strategic than the health care system. The outcome of a medical treatment only depends on the patient's health status and the doctor's inputs, while the outcome of a lawsuit is affected by many factors. In addition to the lawyer's inputs, both the plaintiff's and the defendant's strategic decisions in the litigation process play important roles in the outcome of the case. This may imply that the model of legal expenses insurance has to contain some features of litigation strategies. Second, although legal insurance and health care insurance are analogous systems, fee regulations of a legal system distinguish the payment system of legal insurance from health care insurance. In principle, fixed fees, hourly fees and conditional fees are the only methods that lawyers can charge in England and Wales. These specific fee arrangements reflect the particularity of the legal insurance system. Moreover, the payment to the lawyer can be based on the outcome of the lawsuit. For example, under conditional fees, the lawyer is paid only if the case is won. This may provide certain incentives to the lawyer to input more into the case. However, in health care, since the health status is difficult to verify, the payment to the doctor can not be based on the outcome of the treatment. Third, the English cost rule complicates the legal expenses insurance market. According to the English cost rule, the loser has to pay the winner's legal costs. This makes the insurance contract liable to cover the client's own costs and also potential payments to the rival of the litigation. These risks are related with the outcome of the lawyer's inputs. However, health care insurance only needs to cover treatment costs of a potential sickness. There are no other risks to the insurer. These aspects illustrate the differences between legal expenses insurance and health care insurance. The unique features of legal expenses insurance distinguish modelling of optimal insurance-payment system from those
current models of health insurance. Nevertheless, the studies of health care systems can still inspire modelling and analysis of legal expenses insurance.

2.6.2 Optimal health care insurance system

Arrow (1963) first observed that an efficient health insurance policy would specify payment contingent on the (potential) patient’s state of health. He found that the state-contingent payment scheme would protect the patient from the financial risk of illness \textit{ex ante} and retain incentives for the patient to consume health care efficiently \textit{ex post}.

However, since health status is too costly to verify, insurance policies contingent on health status do not exist in market. Therefore, economists started to analyse the optimal health care insurance under the assumption that insurance coverage based on the patients’ choice of treatment quantity. Pauly (1968) and Zeckhauser (1970) characterise the trade-off between risk sharing and moral hazard. They concluded that the patient must pay for each unit of treatment exposes him to some risk \textit{ex ante} but also partly remedies his incentives to consume an excessive amount of health care \textit{ex post}.

Ma & McGuire (1997) was the first paper to solve the “three-way relationship” in health care insurance. In their settings, health care, which is a strictly concave function $f$, is produced by a patient-controlled input (number of visits) $\tau$ and a doctor-controlled input (effort) $\varepsilon$, neither of which is directly contractible. Given the insurance and payment parameters, the physician chooses her effort level, and upon observing the effort, the patient decides on the quan-
tity to purchase. Then, the doctor can induce different quantity demands by offering different effort. This is the typical environment of supplier-induced demand (Phelps 1986). The physician can report any number of visits \( r^R \) to the insurance company that they wish regardless of the actual number of visits \( r \) that they complete and which are recorded in the medical records. Health is measured in cash equivalent units. Patient gets utility from income and health. The physician is profit maximisers, but receives less utility the more effort they put forth.

In the paper, the extensive form of the health care insurance game consists of five stages:

1. The insurer chooses the elements of the insurance and payment systems;

2. “Nature” decides whether the patient is ill with probability \( \pi \). If not, the game ends; otherwise, the patient seeks health care from the physician;

3. The physician chooses her effort, \( \varepsilon \);

4. After observing the doctor’s choice of effort, the patient chooses the quantity of treatment, \( r \);

5. The doctor and the patient play a billing subgame. Subsequently, the insurer pays the resulting bill.

Ma & McGuire (1997) highlights three conclusions. First, in order to induce truth telling the physician must receive a positive payment for her services and the patient must have a positive co-payment. Second, if effort and treatment are substitutes, the doctor will reduce \( s \) to the minimum level to maximise
\( \tau \). If effort and treatment are complements, the doctor will put an high level of effort. Third, if the physician has ethical notion of a minimal level of care that \( f(\tau, \varepsilon) > F' \), in this case, the doctor’s effort may increase from its lower bound (in the substitute case). Also, in the general equilibrium, the patient’s co-payment may need to increase.

### 2.7 Summary and conclusions

The previous studies have developed a sound theoretical approach to study litigation processes. This approach focuses on the litigants' financial incentives. Within the research of settlement, economists focus on the costs tradeoff between settlement and trial. Within the research of principal-agent problems, costs-related conflicts of interests between clients and lawyers become the main objective. In addition to this, early research enables us to compare legal institutions between jurisdictions. For example, studies on fee shifting rules have examined the situation when contingent fees are adopted in an English cost rule jurisdiction.

However, we also observe some limitations of existing studies. Within the literature of legal insurance, there are seldom studies which combine specified fee arrangements with legal expenses insurance, especially the after-the-event legal expenses insurance and the conditional fees. There are actually only four papers explicitly addressing legal expenses insurance (van Velthoven & van Wijck (2001), Kirsten (2000), Kirsten & Rickman (2004) and Heyes et al. (2004)). None of these papers consider, however, the combination effects of conditional fees and insurance in an English cost rule jurisdiction. For exam-
pie, early studies show that the litigant may be less willing to settle the case under conditional fees, since compared to hourly fees conditional fees increase his settlement costs. But, will the situation change if the litigant does not bear any legal cost directly, as in the case of legal expenses insurance?

In addition, we observe that most of the early literature on principal-agent problems assume the lawyer’s legal effort is her time to spend in the case but no one looks into the case where the lawyer inputs different effort in her service time or when the marginal productivity of her hour is endogenous. Including this missing market into consideration may change existing results of principal-agent problems analysis in litigation context. Another particularly interesting question is if there is an optimal legal expenses insurance system for both insurance purchasing and legal fees payment. Existing literature fails to answer this question. The reason of this may be because the legal expenses insurance market is not fully mature.

Finally, another limitation in the previous studies is also related to the legal expenses insurance market. The current business structure of legal services is dominated by a partnership structure. Actually, this business structure is regulated by law but not derived from the market. If, as Clementi (2004) suggests, constraints on the business structure of legal services are broken and outside capital is allowed into legal services, will be there any effect on lawyers' legal effort? This question has not yet been examined by economists.

The remaining chapters of this thesis seek to begin the process of studying there issues.
Chapter 3

Settlement in the presence of insurance
3.1 Introduction

The question of how to assure access to justice is a fundamental one in all jurisdictions. It involves making available suitable institutions and expertise to help access these, at an affordable price and in ways that help share the risk of what may be very uncertain negotiations. In England and Wales, although the market for legal expenses insurance has developed slowly, policymakers have been looking to substitute private insurance for the increasingly expensive social insurance against legal expense provided by legal aid. One mechanism for achieving this is the conditional fee arrangements (which involves legal expenses insurance). The interesting feature of this new policy is that the insurance is bought "after-the-event" (ATE), as opposed to more traditional "before-the-event" (BTE) legal insurance. The overall effect of this development is to introduce elements of US-style contingency payment and European-style insurance into UK litigation so this is a topic with potentially broad appeal. Furthermore, "access to justice" is not the only purpose of the new institutions. Minimising total social (legal) cost is another important goal (Gravelle & Waterson 1993). It may be fulfilled by encouraging settlement and reducing accidents.\(^1\) However, the combined effect of insurance and fee arrangements on social cost is still unclear.

The purpose of this chapter is to consider the effects of legal insurance and fee arrangements on the decision to settle or take a case to trial. Thus, we now take the insurance arrangement as given and also introduce a pre-trial litiga-

\(^1\)If the effort of avoiding the accident is very costly, there is a possibility that (at a certain level) total social cost will increase by reducing accidents. This is the issue of how to design the negligence rule. In this thesis we do not focus on the negligence rule, but we will discuss the cost of care and its welfare implications in Section 3.2.6.
tion phase. A number of other authors have looked at various aspects of the problem we study. Thus, the role of fees in litigation has been considered, as has the role of conditional fees (without the added insurance dimension), while legal expenses insurance has also been analysed (see Chapter 2). Furthermore, empirical work has established several important effects of conditional fees in this respect. However, none of this work looks at the combined effects of insurance and conditional fees. In itself, this means that there is a gap in terms of the institutional detail that has been researched. More important, it means that the after-the-event innovation has received no attention.

The present chapter is structured as follows. Section 3.2 sets out our basic model of accidents and litigation under legal insurance but without specifying the payment contract between the insurer and the lawyer. We show how the insurance influences all the endogenous variables in the model. In Section 3.3, we use the general framework of Section 3.2 to analyse the implications of the before-the-event hourly fee contract and the after-the-event conditional fee contract. In Section 3.4, we discuss uniform distribution, risk aversion, unrecoverable insurance premium and success fee. In addition, we extend our basic model to a dynamic one to analyse the timing of settlement. Section 3.5 concludes.

---


3 Fenn, Gray, Rickman & Mansur (2006) confirms the increasing dominance of these two funding mechanisms in UK litigation.
3.2 The model and the effects of legal expenses insurance

3.2.1 Sequence of events

Based on the model of Gravelle & Waterson (1993), we use a litigation model to illustrate the effects of legal expenses insurance on litigants’ behaviours and welfare. The notation is summarised in Table 3.1. A risk neutral potential defendant \( D \) is engaged in an activity which has the probability \( \pi \) of imposing a random loss \( L \) on a risk neutral plaintiff \( P \). The value of loss is private information of the plaintiff, the defendant only knows the distribution function of the loss \( Q(L) \) and its density \( q(L) \). This is in common with much of the literature in Chapter 2. The defendant can reduce the probability of the accident \( \pi \) by an expenditure \( x \) on care, where \( \pi'(x) < 0 \) and \( \pi''(x) > 0 \). If the accident occurs the plaintiff retains a lawyer who is assumed to be risk neutral. The defendant then makes a single “take it or leave it” settlement offer \( S \) to the plaintiff. If the case is settled, the lawyer charges a fee \( f^5 \). If the offer is rejected by the plaintiff, the case goes to trial. The plaintiff’s probability of winning at trial is \( p \). If he does win, he is awarded his loss \( L^4 \). The litigation costs are public information for both parties since they are less likely to be victim specific.\(^5\) The lawyer charges \( f^w \) if the case wins at trial or \( f^0 \) if it loses. Since cost shifting rules exist, the loser has to pay the winner a proportion \( k \) of the total legal fees. Thus, the expected legal fees transfer

\(^4\)To keep the analysis manageable we ignore the possibilities of over-compensation and under-compensation from the judgement.

\(^5\)However, the litigation costs may be loss specific. One explanation for this is that high loss cases have longer pre-trial negotiation periods. Our dynamic model in the discussion section will provide a reasonable illustration to this assumption.
<table>
<thead>
<tr>
<th>Notation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>$P$</td>
<td>plaintiff</td>
</tr>
<tr>
<td>$D$</td>
<td>defendant</td>
</tr>
<tr>
<td>$A$</td>
<td>plaintiff’s lawyer/advocate</td>
</tr>
<tr>
<td>$c_0$</td>
<td>pre-trial legal costs incurred for $P$ by $A$</td>
</tr>
<tr>
<td>$c_1$</td>
<td>trial legal costs incurred for $P$ by $A$</td>
</tr>
<tr>
<td>$c_P$</td>
<td>$P$’s total legal costs ($c_0 + c_1$)</td>
</tr>
<tr>
<td>$f^D$</td>
<td>$D$’s total legal fees if trial</td>
</tr>
<tr>
<td>$f^S$</td>
<td>fee paid by $P$ to $A$ if case settled</td>
</tr>
<tr>
<td>$f^w$</td>
<td>fee paid by $P$ to $A$ if case tried and won</td>
</tr>
<tr>
<td>$f^l$</td>
<td>fee paid by $P$ to $A$ if case tried and lost</td>
</tr>
<tr>
<td>$\lambda \in [0,1]$</td>
<td>relative weight $A$ places on $P$’s income</td>
</tr>
<tr>
<td>$k$</td>
<td>proportion of costs shifted from loser to winner</td>
</tr>
<tr>
<td>$p$</td>
<td>probability that $P$ wins at trial</td>
</tr>
<tr>
<td>$t$</td>
<td>expected cost transfer $k[pf^w - (1 - p)f^D]$ to $P$ from $D$ after trial</td>
</tr>
<tr>
<td>$L$</td>
<td>$P$’s random loss if accident, $L \in [L_0, L_1]$</td>
</tr>
<tr>
<td>$Q(L), q(L)$</td>
<td>distribution, density function of $L$</td>
</tr>
<tr>
<td>$\ell$</td>
<td>acceptance level</td>
</tr>
<tr>
<td>$Q(\ell)$</td>
<td>settlement probability, $Q' &gt; 0$</td>
</tr>
<tr>
<td>$S$</td>
<td>$D$’s settlement offer to $P$</td>
</tr>
<tr>
<td>$H$</td>
<td>$D$’s expected post-accident cost</td>
</tr>
<tr>
<td>$x$</td>
<td>$D$’s expenditure on care</td>
</tr>
<tr>
<td>$\pi(x)$</td>
<td>accident probability, $\pi' &lt; 0, \pi'' &gt; 0$</td>
</tr>
<tr>
<td>$y_P$</td>
<td>$P$’s income if no accident</td>
</tr>
<tr>
<td>$y_D$</td>
<td>$D$’s income if no accident</td>
</tr>
<tr>
<td>$W_0$</td>
<td>$D$’s $ex$ $ante$ welfare</td>
</tr>
<tr>
<td>$W^P$</td>
<td>$P$’s $ex$ $post$ welfare</td>
</tr>
<tr>
<td>$W^A$</td>
<td>$P$’s $ex$ $ante$ welfare</td>
</tr>
<tr>
<td>$\alpha_A$</td>
<td>ATE insurance premium paid by the plaintiff to the insurer</td>
</tr>
<tr>
<td>$\alpha_B$</td>
<td>BTE insurance premium paid by the plaintiff to the insurer</td>
</tr>
</tbody>
</table>

73
from the defendant to the plaintiff is 
\[ t = k[pf^w - (1 - p)f^D] \]
where \( f^D \) is the defendant's total legal fees. The plaintiff's litigation costs can be funded either by himself or by BTE insurance or by ATE insurance. The interaction takes place in four stages:

- The insurance stage: The plaintiff decides whether to purchase legal expenses insurance.
- The accident stage: An accident occurs with probability \( r \). The plaintiff incurs a loss \( L \) in the event of the accident.
- The settlement stage: The defendant makes a settlement offer \( S \). If the plaintiff accepts the offer, the game ends; if he does not, the case goes to trial.
- The trial stage: The plaintiff wins with probability \( p \). If he does win, he is awarded a compensation \( L \) plus his legal costs.\(^6\)

We distinguish the plaintiff’s funding methods by the timing of the above stages. If the insurance stage happens prior to the accident stage, we have a case of BTE insurance. If the insurance stage happens after the accident stage, we have a case of ATE insurance. If there is no the insurance stage, the plaintiff is self-funded. For simplification, we assume that the defendant is self-funded, which is common knowledge in our game.

For legal fees, by definition we have \( f^0 \leq f^w \) and \( f^S < f^w \). In this section, we focus on the effects of insurance. The implications of specified fee arrangements and funding methods will be discussed in Section 3.3.

\(^6\) We divide the entire litigation game by its subgames. If we combine the last two stages together as a litigation stage, our description becomes consistent with the one in Kirstein (2000). This will not affect the analysis.
3.2.2 The willingness to settle

The lawyer, if selfish, would accept settlement if and only if

\[ f^S - c_0 \geq p f^w + (1 - p) f^0 - c_p, \]  

(3.1)

where the left hand side is her net receipts if the case is settled and the right hand side is the expected net proceeds from a trial. Thus, her expected gain from settlement compared with trial is

\[ G^A = f^S - p f^w - (1 - p) f^0 + c_l. \]

It is clear that in this general model the plaintiff's loss from the accident has no direct impacts on her expected gain from settlement. Also, her gain does not rely on whether the plaintiff purchases insurance or not.

A well informed self-funded plaintiff would accept the settlement offer \( S \) if

\[ S - f^S \geq p(L - f^w) - (1 - p) f^0 + t, \]  

(3.2)

the expected gain from acceptance compared with trial for him is:

\[ G^{PS} = S - pL + p f^w + (1 - p) f^0 - f^S - t. \]

The self-funded plaintiff would accept an offer \( S \) if and only if \( G^{PS} \geq 0 \). Since \( G^{PS} \) is decreasing in \( L \), if there exists \( \ell \in [L_0, L_1] : G = 0 \) then \( \ell \) is the unique acceptance level.\(^7\) Equivalently, when \( S \) is given, he would accept an offer

\(^7\)There are also another two cases to consider. First, if there exists \( \ell \in [L_0, L_1] : G > 0 \)
whenever $\ell^{PS}(S, \cdot) \geq L$ where $\ell^{PS}$ is the self-funded plaintiff’s acceptance level defined by $G^{PS} = 0$.

Now we consider a well informed insured plaintiff. The settlement offer normally includes two parts: the compensation of loss and the reimbursement of legal costs. We assume the plaintiff’s legal costs have to be paid by himself if accepting settlement. Therefore, the plaintiff’s net receipt is only the compensation of the loss. He would accept the settlement offer $S$ if

$$S - f^S \geq pL, \quad (3.3)$$

So his expected gain from settlement is

$$G^{PI} = S - pL - f^S.$$ 

As in the self-funded situation, we define this acceptance level as $\ell^{PI}(S, \cdot)$.

Now, we assume that the plaintiff’s legal knowledge is such that he always accepts his lawyer’s advice on accepting or rejecting a settlement offer. Since there may be potential conflicts of interest over settlement between the plaintiff and the lawyer if their acceptance levels are different, we introduce the weight

---

8Since the insurance stage happens before the settlement stage, we do not need to distinguish BTE and ATE insurance until analysing the plaintiff’s ex ante welfare. Also, in this section, we assume the insurance premium is unrecoverable by the losing party. The recoverable premium is discussed along with specified contracts in Section 3.3.

---
parameter $\lambda \in [0, 1]$, so that the total gain from settlement is given by

$$G = \lambda G^P + (1 - \lambda)G^A. \quad (3.4)$$

Therefore, the self-funded plaintiff will accept the settlement offer whenever:

$$\lambda(S - f^S) + (1 - \lambda)(f^S - c_0) \geq \lambda[p(L - f^w) - (1 - p)f^0 + t] + (1 - \lambda)[pf^w + (1 - p)f^0 - c_P] \quad (3.5)$$

When the above inequation holds as an equality, the acceptance level of the self-funded plaintiff $\ell_{PS}$ can be solved as

$$\ell_{PS} = \frac{\lambda[S - f^S + pf^w + (1 - p)f^0 - t] + (1 - \lambda)[f^S - pf^w - (1 - p)f^0 + c_1]}{\lambda p}$$

Similarly, the insured plaintiff will accept the settlement offer whenever

$$\lambda(S - f^S) + (1 - \lambda)(f^S - c_0) \geq \lambda p L + (1 - \lambda)[pf^w + (1 - p)f^0 - c_P] \quad (3.6)$$

For the situations above, if (3.5) and (3.6) hold as an equality separately, each of them has zero gain from settlement $G = 0$. Note that, the plaintiff’s probability of winning actually reflects the difficulty of the case, e.g. a low $p$ means it is a difficult case to win. We can note some results:

**Result 3.1.** The acceptance level $\ell(S, \lambda, p, \cdot)$ (1) increases with the settlement offer at the rate $\partial \ell / \partial S = 1/p$ whether the plaintiff is insured or not; (2) increases with the difficulty of the case and is more sensitive if the plaintiff is self-funded under the English cost rule; (3) varies with fee arrangements.
Proof. (1) Since the lawyer’s gain from settlement is given by \( G^A = f^S - pf^w - (1 - p)f^0 + c_1 \), we note that \( G^A_S = 0 \), \( G^A_L = 0 \) and \( G^A_p = f^0 - f^w \leq 0 \).

First, for the self-funded plaintiff \( G^P_S = 1 \), \( G^P_L = -p \) and \( G^P_p = -(1 - k)f^w - f^0 - kf^D \). We find that \( \partial \ell / \partial S = 1/p \) and \( \partial \ell / \partial p = (-\lambda L + (1 - \lambda)(f^0 - f^w) + \lambda[(1 - k)f^w - f^0 - kf^D]) / \lambda p \). Then, for the insured plaintiff, using the same method we have \( \partial \ell / \partial S = 1/p \) and \( \partial \ell / \partial p = [-\lambda L + (1 - \lambda)(f^0 - f^w)] / \lambda p \).

(2) From (1) we have \( \partial \ell / \partial p < 0 \). Note that \( f^0 - f^w < 0 \). Under the English cost rule \( (1 - k)f^w - f^0 - kf^D < 0 \), therefore the self-funded plaintiff has a steeper \( \partial \ell / \partial p \). (3) In both situations, \( G \) always contains \( f^0 \), \( f^w \) and \( f^D \) whatever weight and cost shifting rules.

Since the lawyer’s gain from settlement is independent from the plaintiff’s insurance status, the difference in gains from settlement for the self-funded and insured plaintiff is:

\[
\Delta G = \lambda(G^P_S - G^P_I) = \lambda[pf^w + (1 - p)f^0] - t.
\]

Equivalently, the difference in acceptance levels is:

\[
\Delta \ell = \ell^P_S - \ell^P_I = \lambda[pf^w + (1 - p)f^0 - t] / p.
\]

Substituting \( t = k[pf^w - (1 - p)f^D] \) into the above equation, yields

\[
\Delta \ell = \lambda[1 - k]pf^w + (1 - p)f^0 + k(1 - p)f^D / p.
\] (3.7)

Since \( 0 \leq k \leq 1 \) and \( p < 1 \), \( \Delta \ell \) is always positive.
Result 3.2. Given the defendant’s settlement offer, if the plaintiff purchases insurance, his acceptance level becomes lower.

By the definition of acceptance level $\ell$, the probability of a given offer $S$ being accepted is $Q(\ell)$, where $q(\ell) > 0$. The higher the acceptance level, the higher the probability of settlement, and vice versa. Thus, if we do not consider the reaction of the defendant, given a settlement offer, insurance induces trial rather than settlement. This is consistent with Heyes et al. (2004)’s results.

3.2.3 The defendant’s settlement offer

The defendant chooses the settlement offer $S$ to minimise his expected post-accident costs $H$ given that acceptance level is a function of $S$ and the distribution function of loss $Q$:

$$H = Q(\ell)S + [(1 - Q(\ell))(f^D + t) + p \int_t^{\lambda} LdQ].$$  \hspace{1cm} (3.8)

The first order condition defining optimal settlement offer $S^*$ is:

$$\frac{dH}{dS} = Q(\ell) + \frac{q(\ell)}{p}(S^* - p\ell - f^D - t) = 0.$$ \hspace{1cm} (3.9)

Obviously, the corner solution of the settlement offer is $S^* = f^D + t$. This implies that the defendant increases the settlement offer if and only if the trial is more costly than settlement and the increase in the settlement offer reduces the probability of the trial ($q\partial \ell / \partial S = q/p$). Rearranging equation (3.9), the
settlement offer $S^*$ becomes:

$$S^* = S(\ell, \cdot) = p\ell + fD + t - p\frac{Q(\ell)}{q(\ell)}.$$  

Since the defendant's offer is a function of acceptance level $\ell$, we have

$$\frac{dS}{d\ell} = p - p\frac{q^2(\ell) - Q(\ell)q'(\ell)}{q^2(\ell)} = q'(\ell)p\frac{Q(\ell)}{q^2(\ell)}. \quad (3.10)$$

Then, the effect of insurance on the defendant's settlement offer is given by:

$$\Delta S = S^S - S^I = \int_{\ell^I}^{\ell^S} q'(\ell)p\frac{Q(\ell)}{q^2(\ell)}d\ell. \quad (3.11)$$

**Result 3.3.** The defendant will make a lower (higher) settlement offer to the insured plaintiff than to the self-funded plaintiff if the loss distribution is convex (concave).

This is a very interesting result. Note that $q'$ is determined by the distribution of accident loss. One might plausibly assume that most plaintiffs suffer small losses while few suffer large losses, so that the distribution of accident losses is skewed to the right and $q' < 0$ over the relevant range. In this case, the defendant will make a higher settlement offer to the insured compared with the self-funded plaintiff ($\Delta S < 0$). If the loss distribution is uniform ($q' = 0$), insurance has no effect on the defendant's settlement offer.

### 3.2.4 Settlement probability

Since insurance influences the settlement offer, it affects the plaintiff's acceptance level as well. Substituting $S^S$ and $S^I$ into (3.2) and (3.3), the acceptance
level between self-funded and insured becomes:

\[ \Delta \ell^* = \ell^{PS^*} - \ell^{PI^*} = \frac{\Delta S}{p} + \Delta \ell. \] (3.12)

It is clear that the settlement probability \( Q[\ell^*(S^*), \cdot] \) is affected by the acceptance level directly and settlement offer indirectly. From (3.7) we know \( \Delta \ell > 0 \), therefore we have

**Result 3.4.** The effect of insurance on the settlement probability is ambiguous. If insurance reduces the settlement offer (\( \Delta S > 0 \)), this decreases the settlement probability (\( \Delta \ell^* > 0 \)).

The above result illustrates that if most plaintiffs suffer large losses whilst a few suffer small losses (\( q' > 0 \)), insurance will reduce the settlement probability. However, if most plaintiffs suffer small losses whilst a few suffer large losses (\( q' < 0 \)), the result is ambiguous. When \( |q'| \) is big enough, there exists a regime where the insurance's effects on settlement offer \( \Delta S \) offsets its effects on acceptance level \( \Delta \ell \), therefore \( \Delta \ell^* < 0 \). If so, insurance does increase settlement probability. Comparing this result with Result 3.2, we conclude that when considering reactions of the defendant the assertion of insurance reducing settlement probability is not sufficient. These also imply that welfare comparisons, which will be conducted in Section 3.2.6, may be ambiguous because, depending on the distribution of the accident loss, the defendant can either increase or decrease his settlement offer. Therefore, in the discussion section of this chapter, we will examine the uniform distributed loss as an example.
3.2.5 Accident probability

Before we move to the defendant’s care decision, it is instructive to investigate the efficient level of care. In the context of litigation, the efficient level of care is defined as the care level which maximises the net welfare of both the plaintiff and the defendant. We assume the litigants are equally weighted in the social welfare, therefore the net social welfare function is:

\[ U = y_P + y_D - x - \pi(x)\{L + f^D + Q(\ell) f^S + [1 - Q(\ell)][pf^w + (1 - p)f^0]\} \]

To maximise the social welfare, the social efficient care level \( x^* \) is given by

\[ \pi'(x^*) = -\frac{1}{L + f^D + Q(\ell) f^S + [1 - Q(\ell)][pf^w + (1 - p)f^0]} \]

From the above equation, we can find that the litigants’ initial incomes \( y_P \) and \( y_D \) do not have impacts on \( x^* \). This implies that rich or poor does not affect the social efficient level of care. Moreover, since \( 0 < Q(\ell) < 1, 0 < p < 1 \) and \( f^0 \leq f^w \), the sign of \( \pi'(x^*) \) is always negative, which means accidents can be reduced by increasing care level. Again, the value of the efficient care level can be solved only when both the specific fee arrangement (\( f^0 \) and \( f^w \)) and the accident probability function (\( \pi \)) are given.

Now, we consider the defendant’s care decision and its effect on accident prob-
ability. The defendant chooses his expenditure on care $x$ to maximise his \textit{ex ante} welfare, which is given by:

$$W_D = [1 - \pi(x)](\gamma_D - x) + \pi(x)(\gamma_D - x - H^*)$$

where $H^*$ is the defendant's minimised post-accident cost: $H^* = Q(\ell)S + [1 - Q(\ell)](f^D + t) + p \int_{\ell}^{L_1} LdQ$.

Assume his optimal care $x^*$ is positive, it satisfies

$$-1 - \pi'(x)H^* = 0$$

and is obviously increasing in $H^*$. In addition, the relationship between the defendant's \textit{ex post} cost $H^*$ and the plaintiff's acceptance level is given by:

$$\frac{dH^*}{d\ell} = q(\ell)(S^* - p\ell - f^D - t).$$

From (3.9), in equilibrium since $Q(\ell) > 0$ we know that $S^* - p\ell - f^D - t < 0$, therefore $\frac{dH^*}{d\ell} < 0$. Now it is clear that $x$ is decreasing in $\ell$. Since the insured plaintiff and self-funded plaintiff may have different settlement offers and different acceptance levels, we have:

\textbf{Result 3.5.} The defendant's care level increases if and only if the insurance reduces the plaintiff's acceptance level. Furthermore, if insurance reduces the settlement offer, this reduces accident probability.

Combining the above result with Result 3.2, we find that given the defendant's
settlement offer, insurance increases the care level and therefore reduces accident probability.

As is in other litigation models (see Gravelle & Waterson (1993), van Velthoven & van Wijck (2001) and Heyes et al. (2004)), the defendant's ex post welfare is increased when a given settlement offer is more likely to be accepted and this is the same for his ex ante welfare. Therefore, the defendant is better off if and only if $\Delta \ell^* < 0$. If the distribution $q' < 0$, as we mentioned in the last subsection, there is a regime where the defendant is better off if the plaintiff is insured.

### 3.2.6 Welfare: BTE, ATE and Self-funded

Assume the insurance premiums are actuarially fair. The insurance premiums are equal to the insurer's payment at trial:

$$\alpha_A = [1 - Q(\ell^{P1*})][pf^w + (1 - p)f^0 - t].$$

$$\alpha_B = \pi[1 - Q(\ell^{P1*})][pf^w + (1 - p)f^0 - t].$$

The ex post welfare of an ATE insured plaintiff is:

$$W_{IA}^p = y_P - L - \alpha_A + Q(\ell^{P1*})(S' - f^S) + p \int_{\ell^{P1*}} LdQ,$$

where $y_P$ is the plaintiff's income if no accident. The ex post welfare of BTE
The insured plaintiff is:

\[ W_{IB}^p = y_P - L - \alpha_B + Q(\ell_P)(S^f - f^S) + p \int_{\ell_P} LdQ, \]

The \textit{ex post} welfare change between these two is:

\[ W_{IA}^p - W_{IB}^p = \alpha_B - \alpha_A = -(1 - \pi)[1 - Q(\ell_P)][pf^w + (1 - p)f^0 - t] \]

Substituting \( t = k[pf^w - (1 - p)f^D] \) into the above equation and rearranging, gives

\[ W_{IA}^p - W_{IB}^p = -(1 - \pi)(1 - Q)[p(1 - k)f^w + (1 - p)(f^0 + kf^D)] < 0. (3.13) \]

Compared with ATE, the risk neutral plaintiff has higher \textit{ex post} welfare if he purchases BTE. The reason for this is that BTE has a lower insurance premium.

The ATE plaintiff's \textit{ex ante} welfare is given by:

\[ W_{IA}^a = (1 - \pi)y_P + \pi W_{IA}^p. \]

As we have shown that the plaintiff's acceptance levels are the same under ATE and BTE, the accident probability \( \pi \) is the same for BTE and ATE as well. We can write the BTE plaintiff's \textit{ex ante} welfare as:

\[ W_{IB}^a = (1 - \pi)(y_P - \alpha_B) + \pi W_{IB}^p. \]
The change of \textit{ex ante} welfare is:

\[ W_{IA}^a - W_{IB}^a = (1 - \pi)y_p - (1 - \pi)(y_p - \alpha_B) + \pi(W_{IA}^p - W_{IB}^p) \]

Since \( W_{IA}^p - W_{IB}^p = \alpha_B - \alpha_A \), we have

\[ W_{IA}^a - W_{IB}^a = \alpha_B - \pi \alpha_A = 0 \quad \text{(3.14)} \]

For the defendant, his welfare only changes with the plaintiff's acceptance level. Since the acceptance levels keep the same whatever the type of insurance, the defendant's welfare is the same across ATE and BTE. Therefore, the change of social welfare is only affected by the plaintiff's welfare change. We conclude:

\textbf{Result 3.6.} \textit{In a competitive insurance market, the plaintiff's ex ante welfare and the defendant's ex ante and ex post welfare does not change across ATE and BTE. However, the plaintiff has higher ex post welfare under BTE.}

When the insurance is unavailable, the plaintiff's \textit{ex post} welfare is:

\[ W_{PS}^p = y_p - L + Q(e^{PS})(S^S - f^S) + p \int_{Q^{PS}} LdQ \]

\[-[1 - Q(e^{PS})][pf + (1 - p)f^0 - t].\]

Comparing this with ATE, we get:

\[ W_{IA}^p - W_{PS}^p = Q(e^{PI^*})(S^I - f^S) - Q(e^{PS})(S^S - f^S) - p \int_{Q^{PS}} LdQ \]

\[ + [Q(e^{PI^*}) - Q(e^{PS})][pf + (1 - p)f^0 - t]. \]
The first two terms above are insurance's effect on settlement. As we showed before, the difference between the settlement offers \((S^S - S^I)\) depends on the distribution of accident loss. The difference between the acceptance levels \((\ell^{PI*} - \ell^{PS})\) partly depends on \((S^S - S^I)\). The integral term reflects the effect of insurance on the trial compensation. The last term is the risk of trial: refusing to reach a settlement may incur a higher legal cost.

Clearly, much depends on the loss distribution. If \(q' > 0\), which means most plaintiffs suffer large losses whilst a few suffer small losses, since \(S^S > S^I\) and \(\ell^{PS} > \ell^{PI*}\), we have \(Q(\ell^{PI*})(S^I - f^S) - Q(\ell^{PS})(S^S - f^S) < 0\), \(p \int_{\ell^{PI*}}^{\ell^{PS}} LdQ < 0\) and \([Q(\ell^{PI*}) - Q(\ell^{PS})][pf^m + (1 - p)f^0 - t] < 0\). The sign of \(W_{IA} - W_{PS}^p\) is ambiguous. Insurance imposes a positive gain from the trial compensations, but reduces the probability of settlement and increases the risk of costly legal fees at trial. Only when its gain offsets these negative effects, does ATE produce higher *ex post* welfare. If the loss distribution is uniform, \(q' = 0\), where \(S^S = S^I\) and \(\ell^{PS} > \ell^{PI*}\), we get the same result. If \(q' < 0\), where \(S^S < S^I\), there are three regimes: \(\ell^{PS} > \ell^{PI*}\), \(\ell^{PS} = \ell^{PI*}\) and \(\ell^{PS} < \ell^{PI*}\). Only in the regime of \(\ell^{PS} = \ell^{PI*}\), is \(W_{IA} - W_{PS}^p > 0\). In other regimes, the results are still ambiguous.

The intuition behind the analysis is interesting. Asymmetric information will generally result in some degree of inefficiency in the bargaining process. The extent of inefficiency is related to the nature of the distribution of the information. As suggested by literature,\(^{11}\) because the plaintiff’s private information cannot be credibly passed to the defendant without a cost being incurred by

---

\(^{11}\)see signaling models in Chapter 2 for detail.
the plaintiff via the signaling of the information, the plaintiff can be harmed by asymmetric information. Moreover, since the strategic role of insurance encourages the plaintiff’s rant seeking, an insured plaintiff has a higher acceptance level than a self-funded plaintiff.

The self-funded plaintiff’s ex ante welfare is:

\[ W_{PS}^a = [1 - \pi(\ell^{PS})]y_P + \pi(\ell^{PS})W_{PS}^p. \]

Then, the ex ante welfare change between ATE and self-funded is given by:

\[ W_{IA}^a - W_{PS}^a = [\pi(\ell^{PS}) - \pi(\ell^{PI^*})]y_P + \pi(\ell^{PI^*})W_{IA}^p - \pi(\ell^{PS})W_{PS}^p. \]

The comparison is ambiguous. If insurance reduces the acceptance level, so the accident probability is reduced. A positive gain in ex ante income comes from the comparison: \[ \pi(\ell^{PS}) - \pi(\ell^{PI^*})]y_P > 0. \] But the sign of \[ \pi(\ell^{PI^*})W_{IA}^p - \pi(\ell^{PS})W_{PS}^p \] is not clear. Only in the regime $\ell^{PS} = \ell^{PI^*}$: \((q' < 0)\), do we have \[ W_{IA}^a - W_{PS}^a > 0. \]

Using Result 3.6, we find that the comparisons between BTE and self-funded will have the similar results. The welfare comparisons are ambiguous as well. Only in the regime $\ell^{PS} = \ell^{PI^*}$: \((q' < 0)\), does BTE have obviously higher welfare both ex ante and ex post for the plaintiff.
3.3 BTE hourly fee contract vs ATE conditional fee contract

3.3.1 Specification of the contracts and funding methods

In addition to the funding methods that we discussed in the previous section, the payment contracts between the plaintiff and his lawyer affect litigants' behaviour and welfare as well.\(^{12}\) Empirically, there are two contracts of interest: the hourly fee contract and the conditional fee contract.\(^{13}\) We make a breakeven assumption for all contracts that competition or regulation ensure that the lawyer makes an expected profit of zero. In an hourly fee contract the lawyer is paid a fee equal to her costs whatever the result of the case. We note that \(f^S = c_0\) and \(f^w = f^0 = c_p\). In a conditional fee contract the lawyer is paid a fee equal to her costs plus a success fee which is a proportionate mark-up of \(\mu\) if the plaintiff wins or settles. If the plaintiff loses, the lawyer gets nothing. We note that \(f^S = (1 + \mu)c_0\), \(f^w = (1 + \mu)c_p\) and \(f^0 = 0\). Under the English cost shifting rule the losing party has to pay the winning party's legal fee, therefore for the hourly fee \(t_H = pc_p - (1 - p)f^D\), for the conditional fee \(t_C = p(1 + \mu)c_p - (1 - p)f^D\).

If the plaintiff purchased legal expenses insurance before the accident (BTE insurance), all his legal expenses are covered by the insurance policy whatever fee agreement he signed with his lawyer. If the plaintiff was not insured \(^{12}\)before-

\(^{12}\)If combining insurances with fee arrangements, there are at least four combinations. However, in this section, we only discuss the most policy relevant combinations.\(^{13}\)Fenn et al. (2006) confirms the increasing dominance of these two funding mechanisms in UK litigation.
the-event”, he can choose to pay all legal expenses by himself or purchase an “after-the-event” insurance (ATE) before the lawsuit starts. The latter aims to reduce the litigant’s finance risk especially when he loses. We assume both insurance premiums are actuarially fair. Under BTE insurance, the plaintiff pays a premium $\alpha_B$ to the insurer. Under ATE insurance, the plaintiff pays a premium $\alpha_A$ to the insurer, but it may be recovered by the losing party if he wins.

For the lawyer, we assume both contracts are breakeven which gives $Q(f^s - c_0) + (1 - Q)[pf^w + (1 - p)f^0 - c_p] = 0$. Under the hourly contract since $f^s = c_0$ and $f^w = f^0 = c_p$ the lawyer has no difference between settlement and trial. Under the conditional contract, since $f^s = (1 + \mu)c_0 > c_0$, according to the breakeven condition it is clear that $p(1 + \mu)c_p - c_p < 0$. The lawyer is better off if the settlement offer is accepted than if it is rejected. Under conditional fee contract, the plaintiff and the lawyer may have different interests at settlement. This also implies that the lawyer may give biased advice to the plaintiff. For simplification, we assume the lawyer is altruistic ($\lambda = 1$), which means she has no impacts on the plaintiff’s decision.

### 3.3.2 Acceptance levels

Given a settlement offer provided by the defendant, by substituting the specified fees settings into (3.2) and (3.3), we can compare the plaintiff’s acceptance levels. A well informed BTE insured plaintiff, under the hourly fee contract, would accept the defendant’s settlement offer $S$ if

$$S - c_0 \geq pL,$$
So the expected gain from acceptance compared with trial for him is:

\[ G_{Bh} = S - c_0 - pL. \]

The plaintiff would accept the offer \( S \) if only if \( G_{Bh} \geq 0 \). Hence, his acceptance level is

\[ \ell_{Bh} = \frac{1}{p}(S - c_0). \quad (3.15) \]

For a well informed ATE insured plaintiff, under the conditional fee contract, when the insurance premium is recoverable, he would accept the defendant’s settlement offer \( S \) if

\[ S - (1 + \mu)c_0 \geq pL + p\alpha_A, \]

his expected gain from settlement is

\[ G_{A\mu} = S - (1 + \mu)c_0 - pL - p\alpha_A. \]

Similarly, his acceptance level is

\[ \ell_{A\mu} = \frac{1}{p}[S - (1 + \mu)c_0 - p\alpha_A]. \quad (3.16) \]

Rearranging the acceptance levels from the above two situations, we find

\[ \ell_{A\mu} = \ell_{Bh} - \Delta, \quad (3.17) \]
\[ \Delta = \frac{1}{p}(\mu c_0 + p\alpha_A). \]  

(3.18)

Compared with the BTE hourly fee contract, the ATE conditional fee contract increases the plaintiff's costs by \( \mu c_0 \) if the offer is accepted and revenue by \( p\alpha_A \) if it is rejected. Since \( \Delta > 0 \), the plaintiff is less willing to accept the offer \( S \) under ATE conditional fee contract. We have established:

**Result 3.7.** Given the defendant's settlement offer, compared with the BTE hourly fee contract, the ATE conditional fee contract lowers the plaintiff's acceptance level.

### 3.3.3 The settlement offers

The defendant chooses the settlement offer \( S \) to minimise his expected post-accident cost \( H \). For the BTE hourly fee contract, this cost is given by

\[
H_{Bh} = Q(\ell^{Bh})S + [1 - Q(\ell^{Bh})]p(f^D + c_P) + p \int_{L_1}^{L_2} LdQ.
\]

The first order condition defining optimal settlement offer \( S_{Bh} \) is:

\[
\frac{dH_{Bh}}{dS} = Q(\ell^{Bh}) + \frac{q(\ell^{Bh})}{p}(S_{Bh} - pf^{Bh} - pf^D - pc_P) = 0.
\]

Therefore, the defendant's settlement offer \( S_{Bh} \) becomes:

\[
S_{Bh} = S(\ell, \cdot) = pf^{Bh} + p(f^D + c_P) - p \frac{Q(\ell^{Bh})}{q(\ell^{Bh})}.
\]  

(3.19)
Similarly, for the ATE conditional fee contract, the defendant’s expected post-accident cost $H^{A_H}$ becomes:

$$H^{A_H} = Q(\ell^{A_H})S + [1 - Q(\ell^{A_H})]p[f^D + (1 + \mu)c_P + \alpha_A] + p \int_{\ell^{A_H}}^{L_1} LdQ.$$ 

Then, the defendant’s optimal settlement offer is:

$$S^{A_H} = p\ell^{A_H} + p[f^D + (1 + \mu)c_P + \alpha_A] - p \frac{Q(\ell^{A_H})}{q(\ell^{A_H})}. \tag{3.20}$$

Note that $\frac{dS}{d\ell} = p - p\frac{q^{2}(\ell)-Q(\ell)q'(\ell)}{q^{3}(\ell)} = q'(\ell)p\frac{Q(\ell)}{q^{3}(\ell)}$, the difference between the settlement offers is given by:

$$S^{B_H} - S^{A_H} = -p(\mu c_P + \alpha_A) + \int_{\ell^{A_H}}^{\ell^{B_H}} q'(\ell)p\frac{Q(\ell)}{q^{3}(\ell)} d\ell. \tag{3.21}$$

Since $\ell^{B_H} - \ell^{A_H} = \Delta > 0$, we can conclude:

**Result 3.8.** The ATE conditional fee contract increases the defendant’s settlement offer compared with the BTE hourly fee contract if $q'(\ell)$ is non-positive.

There are two terms in the right hand side of equation (3.21). The first term, $-p(\mu c_P + \alpha_A)$ reflects the direct effect of fee contracts on the defendant’s settlement offer decision. Since under the ATE conditional fee contract if the defendant loses he has to pay more (i.e. insurance premium), this term is always negative. The second term $\int_{\ell^{A_H}}^{\ell^{B_H}} q'(\ell)p\frac{Q(\ell)}{q^{3}(\ell)} d\ell$ is the indirect influence of the plaintiff’s acceptance level given a settlement offer. It is clear this is based on the understanding of the accident loss. If most plaintiffs suffer small losses while few suffer large losses ($q'(\ell) < 0$) or the loss is uniform...
distributed \( q' = 0 \), the defendant will increase his settlement offer to the ATE conditional fee plaintiff compared with the BTE hourly fee plaintiff. The overall effects of the two terms increase his settlement offer. Conversely, if the loss distribution changes as few suffer small losses \( q'(\ell) > 0 \), the effect of the acceptance level causes a reduction in the settlement offer, but it is still not clear if this reduction can offset the effect of the fee contracts which increases the settlement offer.

### 3.3.4 Settlement and accident probability

As we concluded in the previous section, changes in the defendant’s settlement offer directly affect the plaintiff’s acceptance level. Substituting the defendant’s reactions (settlement offers) into the acceptance level functions, we obtain:

\[
\Delta = \frac{1}{p} (S_{Bh} - S_{A\mu}) + \int_{\ell_{A\mu}}^{\ell_{Bh}} q'(\ell) \frac{Q(\ell)}{q^2(\ell)} \, d\ell + \mu \left( \frac{c_0}{p} - c_P \right) \tag{3.22}
\]

The first term in (3.22) is the indirect effect of the acceptance levels for a given settlement offer. We focus on the second term \( \mu \left( \frac{c_0}{p} - c_P \right) \). The sign of this term depends on the balance of \( c_0/p \) and \( c_P \). The negative \( c_P \) reflects the effect of the defendant increasing the settlement offer under the ATE conditional fee contract, which increases the possibility of settlement. The positive \( c_0 \) comes from the reduction in the acceptance level caused by the ATE contract. Note that \( c_P = c_0 + c_1 \), where \( c_0 \) is the defendant’s pre-trial cost and \( c_1 \) is the cost of trial. Rearrange the second term, the condition becomes \( (1 - p)c_0 \leq pc_1 \). It is clear that if \( c_0 \) increases, the plaintiff is more likely to settle the case under BTE hourly fee contract. This is because the conditional fee increases
the marginal pre-trial cost by \( \mu \) and therefore lowers the plaintiff's willingness to settle. Given a winning probability \( p \), if the marginal increase in settlement offer, which is caused by the increase in \( c_1 \), does not exceed the marginal increase in pre-trial cost, the plaintiff does not have enough incentive to settle the case under an ATE conditional fee contract. If the probability of winning \( p \) increases, the defendant's expected costs increase, especially when there is a mark-up fee \( \mu \). In this case since the marginal cost of trial is positive, the defendant will increases his settlement offer, and therefore increases the acceptance level. So under ATE conditional fee the plaintiff is more likely to settle the case when the winning probability increases.

From Result 3.5, we know that the defendant's expenditure on care \( x \) is decreasing in \( \ell \). So, when \( \ell^{Bh} - \ell^{A\mu} > 0 \), the BTE hourly fee contract increases the accident probability compared with the ATE conditional fee contract. Accordingly, when \( \ell^{Bh} - \ell^{A\mu} < 0 \), the ATE conditional fee contract increases the accident probability. There is another situation, \( \ell^{Bh} = \ell^{A\mu} \) (i.e \( c_0 = pcP \) and \( q' = 0 \)), and here under the two contracts the accident probabilities are the same.

### 3.3.5 Welfare analysis

We start with the defendant. The defendant's *ex post* welfare is

\[
W_D^p = y_D - x - H.
\]

Since \( dH/d\ell < 0 \), it is clear that the defendant's *ex post* welfare is increased if a given settlement offer is accepted. We conclude that the defendant is better
off *ex post* if and only if the acceptance level increases.

The defendant’s *ex ante* welfare is:

\[ W_D = (1 - \pi(x))(y_D - x) + \pi(x)(y_D - x - H^*) = y_D - x - \pi(x)H^*. \]

Since the accident probability \( \pi \) is affected by the acceptance level \( \ell \) through \( x \), the defendant’s *ex ante* welfare can either increase or decrease when the acceptance level increases. This depends on the specific accident probability function \( \pi \). Therefore, the comparison between the defendant’s *ex ante* welfare is ambiguous.

Next, consider the welfare of the plaintiff. The *ex post* welfare of the ATE insured conditional fee plaintiff is:

\[
W_{A\mu}^p = y_P - L - \alpha_A + Q(\ell^{A\mu}*)[S^{A\mu} - (1 + \mu)c_0] \\
+p \int_{\ell^{A\mu}*} LdQ + [1 - Q(\ell^{A\mu}*)]p\alpha_A \\
= y_P - L - (1 - p)\alpha_A + Q(\ell^{A\mu}*)[S^{A\mu} - c_0] \\
-Q(\ell^{A\mu}*)p\Delta + p \int_{\ell^{A\mu}*} LdQ.
\]

And, the *ex post* welfare of the BTE insured hourly fee plaintiff is:

\[
W_{Bh}^p = y_P - L - \alpha_B + Q(\ell^{Bh}*)(S^{Bh} - c_0) + p \int_{\ell^{Bh}*} LdQ,
\]

96
The \textit{ex post} welfare change between these two situations is:

\[ W_{Bh*}^p - W_{A*}^p = (1 - p)\alpha_A - \alpha_B + p \int_{\ell_{Bh*}}^{\ell_{A*}} LdQ + Q(\ell_{A*})p\Delta \]

\[ + Q(\ell_{Bh*})[S_{Bh} - c_0] - Q(\ell_{A*})[S_{A*} - c_0]. \]

Three factors contribute to the welfare change. They are shown in Table 3.2.

<table>
<thead>
<tr>
<th>Settlement offer</th>
<th>Acceptance level</th>
<th>Settlement</th>
<th>Trial</th>
<th>Premium</th>
</tr>
</thead>
<tbody>
<tr>
<td>( S_{Bh} &gt; S_{A*} )</td>
<td>( \ell_{Bh*} &gt; \ell_{A*} )</td>
<td>&gt; 0</td>
<td>&lt; 0</td>
<td>Not clear</td>
</tr>
<tr>
<td>( S_{Bh} = S_{A*} )</td>
<td>( \ell_{Bh*} &gt; \ell_{A*} )</td>
<td>&gt; 0</td>
<td>&lt; 0</td>
<td>Not clear</td>
</tr>
<tr>
<td>( S_{Bh} &lt; S_{A*} )</td>
<td>( \ell_{Bh*} &gt; \ell_{A*} )</td>
<td>&gt; 0</td>
<td>&lt; 0</td>
<td>Not clear</td>
</tr>
<tr>
<td>( S_{Bh} &lt; S_{A*} )</td>
<td>( \ell_{Bh*} = \ell_{A*} )</td>
<td>= 0</td>
<td>= 0</td>
<td>Not clear</td>
</tr>
<tr>
<td>( S_{Bh} &lt; S_{A*} )</td>
<td>( \ell_{Bh*} &lt; \ell_{A*} )</td>
<td>&lt; 0</td>
<td>&gt; 0</td>
<td>Not clear</td>
</tr>
</tbody>
</table>

The first is the gain from settlement: \( Q(\ell_{Bh*})[S_{Bh} - c_0] - Q(\ell_{A*})[S_{A*} - c_0] + Q(\ell_{A*})p\Delta \); the second is the gain from trial: \( p \int_{\ell_{Bh*}}^{\ell_{A*}} LdQ \); and the last is the gain from the difference in the insurance premium: \((1 - p)\alpha_A - \alpha_B\). (The last three columns in Table 3.2 relate to the sign of each of the effects we have identified on the welfare change.) Since the \textit{ex ante} welfares are functions of \textit{ex post} welfare, if the distribution of loss is not given, the comparison between the \textit{ex ante} welfare is ambiguous as well.
3.4 Discussions

3.4.1 Uniform distribution

Given the ambiguous welfare effects summarised in Table 3.2, we now consider the effects a specific loss distribution: the uniform distribution. If the loss distribution is uniform, assuming \( L_0 = 0 \) we can write the probability function of settlement \( Q \) and its density function \( q \) as:

\[
Q = \frac{L}{L_1}, \quad q = \frac{1}{L_1}.
\]

Since now \( q' = 0 \), (3.21) becomes:

\[
S^{th} - S^{A\mu} = -p(\mu c_p + \alpha_A).
\]

Accordingly, the difference between the acceptance levels (3.22) is given by

\[
q^{Bh*} - q^{A\mu*} = \mu \left( \frac{c_0}{p} - c_p \right).
\]

Note that \( q^{Bh*} = (S^{Bh} - c_0)/p \). Substitute \( Q \) into the welfare functions to obtain:

\[
W_{Bh*}^p - W_{A\mu*}^p = (1 - p)\alpha_A - \alpha_B + p \int_{q^{Bh*}}^{q^{A\mu*}} LdQ + Q(q^{A\mu*})p\Delta
\]

\[
+ Q(q^{Bh*})[S^{Bh} - c_0] - Q(q^{A\mu*})[S^{A\mu} - c_0]
\]

\[
= (1 - p)\alpha_A - \alpha_B + \frac{\mu(c_0 - p c_p)}{2L_1}(q^{Bh*} + q^{A\mu*})
\]

There are two terms in the welfare comparison. The first term \((1 - p)\alpha_A - \alpha_B\) reflects the welfare change caused by insurance premium differences. The sec-
The second term \( \mu(c_0 - p c_P)(\ell^{B\ast} + \ell^{A\ast})/2L \) is the income difference from the lawsuit. The income difference is directly affected by the difference in the acceptance levels, which is shown in (3.22). As we discussed in the previous section, the second term is more likely to be positive when the cost of trial \( c_1 \) is comparatively small or the probability of winning \( p \) is small.

To gain further insight into this expression, assume that the insurance premiums are actuarially fair:

\[
\alpha_A = [1 - Q(\ell^{A\ast})](1 - p)f^D
\]
\[
\alpha_B = \pi(\ell^{B\ast})(1 - Q(\ell^{B\ast}))(1 - p)(c_P + f^D)]
\]

and substitute these into \((1 - p)\alpha_A - \alpha_B\). This is non-negative when

\[
p \leq \frac{\alpha_A - \alpha_B}{\alpha_A} = 1 - \pi(\ell^{B\ast})\left[\frac{(L_1 - \ell^{B\ast})(c_P + f^D)}{(L_1 - \ell^{A\ast})f^D}\right]. \tag{3.23}
\]

Substituting \( \ell^{B\ast} = (S^{Bh} - c_0)/p \) and \( \ell^{A\ast} = \ell^{B\ast} - \ell^{A\ast} = \mu(c_0 - c_P) \) into above inequality, the condition becomes:

\[
p \leq 1 - \pi(\ell^{B\ast})\frac{(pL_1 - S^{Bh} + c_0)(c_P + f^D)}{[pL_1 - S^{Bh} + c_0 + \mu(c_0 - p c_P)]f^D}.
\]

Now use \( S^{Bh} - c_0 = p L \) to obtain:

\[
p \leq 1 - \pi(\ell^{B\ast})\frac{(L_1 - L)(c_P + f^D)}{[L_1 - L + \mu(c_0/p - c_P)]f^D}. \tag{3.24}
\]

We now analyse the ex post welfare change \( W_{B\ast}^p - W_{A\ast}^p \) in three scenarios.
Scenario 1, \( c_0 = p_c p \). In this scenario the effect of an increase in the settlement offer offsets the effect of the reduction in acceptance level, therefore \( \ell^{B_h} = \ell^{A_m} \). The welfare change is only caused by the difference in insurance premium: \( W_{Bh}^P - W_{Am}^P = (1 - p)\alpha_A - \alpha_B \). The condition (3.24) becomes \( p \leq 1 - \pi(cp + f^D)/f^D \). We use \( Z_1 \) to denote the right hand side of this inequality. The effects of two exogenous parameters are given by \( \partial Z_1/\partial f^D > 0 \) and \( \partial Z_1/\partial c_p < 0 \). Given a winning probability \( p \) if the defendant’s legal cost increases, the insurer’s risk increases. Accordingly, the insurance premium increases. Since under the ATE conditional fee contract the insurance premium is only recoverable when the case wins, the marginal increase in premium under ATE is higher than under BTE. Therefore, if \( f^D \) increases, the plaintiff is more likely to be better off post-accident under BTE hourly fee contract rather than ATE conditional fee contract. Similarly, if the plaintiff’s legal cost increases, since this cost is recoverable when the case wins, the marginal increase in premium under ATE is lower than it under BTE. Therefore, if \( c_p \) increases the plaintiff is more likely to be better off post-accident under the ATE conditional fee contract.

Scenario 2, \( c_0 > p_c p \). Here, the second term in the welfare change is positive. Use \( Z_2 \) to denote the right hand side of the condition (3.24), since \( \frac{L_1 - L + \mu(c_0/p - c_p)}{L_1} > 0 \), we get: \( \partial Z_2/\partial f^D > 0 \) and \( \partial Z_2/\partial c_p < 0 \). This gives the same results as Scenario 1 for the effect of the insurance premium.

Scenario 3, \( c_0 < p_c p \). Now, the second term in the welfare change is negative, which means that under the ATE conditional fee contract the plaintiff’s gain from the lawsuit (ignoring premium) is greater than under BTE. Since we as-
sume $\alpha_A > 0$, $L_1 - L + \mu (c_0/p - c_P) > 0$. Because now ATE has a higher acceptance level, its insurance premium is reduced. Therefore the difference in the insurance premiums, $(1 - p)\alpha_A - \alpha_B$, shrinks.

There are another three factors in (3.24), $L_1 - L$, $\mu$ and $\pi$. The effect of $\mu$ is to increase the weight of $c_0 - p c_P$ in the premium change. By contrast, the increase in $L_1 - L$ reduces the weight of $c_0 - p c_P$. Since $d\pi/d\ell > 0$ the condition (3.22) is more likely to hold when $\pi$ is more inelastic with respect to $\ell$.

The *ex ante* welfare functions of the BTE hourly fee contract and the ATE conditional fee contract are given by:

$$W_{Bh^*} = [1 - \pi(\ell^{Bh^*})] (y_p - \alpha_B) + \pi(\ell^{Bh^*}) W_{Bh^*}^p.$$  
$$W_{A\mu^*} = [1 - \pi(\ell^{A\mu^*})] y_p + \pi(\ell^{A\mu^*}) W_{A\mu^*}^p.$$  

Hence, the welfare change between BTE hourly fee and ATE conditional fee is:

$$W_{Bh^*} - W_{A\mu^*} = [\pi(\ell^{A\mu^*}) - \pi(\ell^{Bh^*})] y_p - [1 - \pi(\ell^{Bh^*})]\alpha_B$$  
$$+ \pi(\ell^{Bh^*}) W_{Bh^*}^p - \pi(\ell^{A\mu^*}) W_{A\mu^*}^p$$  
$$= [\pi(\ell^{A\mu^*}) - \pi(\ell^{Bh^*})] L - [1 - \pi(\ell^{Bh^*})]\alpha_B$$  
$$+ \pi(\ell^{Bh^*}) [W_{Bh^*}^p - (y_p - L)] - \pi(\ell^{A\mu^*}) [W_{A\mu^*}^p - (y_p - L)].$$  

The sign of the above equation is ambiguous. There are three terms in the equation. The second section $[1 - \pi(\ell^{Bh^*})]\alpha_B$ is positive. Since $d\pi/d\ell > 0$ and $\ell^{Bh^*} > \ell^{A\mu^*}$, the first section $[\pi(\ell^{A\mu^*}) - \pi(\ell^{Bh^*})] L$ is negative. And if $W_{Bh^*}^p >$
3.4.2 Risk aversion

Until now we have assumed a risk neutral plaintiff, one example of this is the strategic purchaser of insurance (Kirstein 2000).\(^{14}\) We now indicate how the model can be amended to allow for plaintiff risk aversion. Under BTE hourly fee and ATE conditional fee, the certainty equivalents of the risky prospects of trials are:

\[
y_T^{\mu} = y_p - (1 - p)L - (1 - p)\alpha_1^A - r^{A\mu}
\]
\[
y_T^{Bh} = y_p - (1 - p)L - \alpha_1^B - r^{Bh}
\]

where \(r^{Bh}\) and \(r^{A\mu}\) are the risk premiums for BTE and ATE respectively and \(\alpha_1^A\) and \(\alpha_1^B\) both recognise that actuarially fair insurance premiums may be sensitive to any changes in acceptance levels brought about by insurance. Note that the expected judgements depend on the realised accident loss. The acceptance levels are given by:

\[
y_p - \ell_T^{A\mu} - \alpha_1^A + S - (1 + \mu)c_0 = y_T^{A\mu}
\]
\[
y_p - \ell_T^{Bh} - \alpha_1^B + S - c_0 = y_T^{Bh}
\]

\(^{14}\)More precisely, risk-neutrality implies that insurance is bought only for strategic reasons. However, there might be other reasons for a risk neutral person to purchase insurance, e.g. mandatory insurance, insurer as delegates in settlement negotiations or as security consultant, etc.
therefore,

$$\ell^B_h - \ell^A_\mu = \frac{1}{p}(r^B_h - r^A_\mu) + \frac{1}{p}(\mu c_0 + p\alpha^1_A) = \frac{1}{p}(r^B_h - r^A_\mu) + \Delta^1$$  \hspace{1cm} (3.25)

where $\Delta^1$ reflects the role of risk aversion in setting insurance premiums. Since trial generally reflects a riskier prospect under the ATE conditional fee contract, we know that $r^B_h < r^A_\mu$. We also know from Heyes et al. (2004) that acceptance levels are higher under risk aversion so $\alpha^1_A < \alpha_A$, so that $\Delta^1 < \Delta$. As a result (3.25) tells us that risk aversion reduces the gap between acceptance levels under BTE and ATE and, indeed, could cause their signs to be reversed. Welfare effects are still ambiguous.

3.4.3 Unrecoverable ATE premium and success fee

Now we return to risk neutrality and move to a situation where neither the ATE premium ($\alpha_A$) nor the plaintiff’s success fee ($\mu$) are recoverable by the defendant if the plaintiff wins. In this case, the plaintiff has to pay them himself. This was the position in England and Wales prior to 2000.

The plaintiff will accept the defendant’s settlement offer only when:

$$S - (1 + \mu)c_0 \geq p(L - \mu c_P).$$

His acceptance level becomes

$$\ell^A = \frac{1}{p}(S - c_0) + \frac{\mu}{p}(pc_P - c_0).$$  \hspace{1cm} (3.26)

Comparing this with the acceptance level under the BTE hourly fee contract
\( (3.15) \), we have:

\[
\ell^{B_h} - \ell^A = \frac{\mu}{p} (c_0 - pc_P). 
\]

(3.27)

Compared with the BTE hourly fee contract, the unrecoverable ATE conditional fee contract imposes more costs on the plaintiff, especially when the case is more likely to go to trial. Since \( \ell^A - \ell^{B_h} = \frac{\mu}{p} (pc_P - c_0) \), the plaintiff is more likely to accept a given settlement offer \( S \) under the unrecoverable ATE conditional fee contract when \( p \) is higher or \( c_0/c_P \) is lower.

Since in these two cases the defendant has the same expected post-accident cost, substituting \( \ell^A \) into (3.10), we establish:

\[
S^{B_h} - S^A = \int_{\ell_A}^{\ell^{B_h}} q'(\ell) p \frac{Q(\ell)}{q^2(\ell)} d\ell. 
\]

(3.28)

The sign of \( S^{B_h} - S^A \) depends on the loss distribution \( q' \) and the sign of \( c_0 - pc_P \). Only if the loss distribution is uniform, are these two settlement offers the same.

As we concluded in previous sections, changes in the defendant’s settlement offer directly affect the plaintiff’s acceptance level. Substituting the defendant’s settlement offer into the acceptance level, we obtain:

\[
\ell^{B_{h^*}} - \ell^{A^*} = \frac{1}{p} (S^{B_h} - S^A) + \frac{\mu}{p} (c_0 - pc_P) 
\]

\[
= \frac{1}{p} \int_{\ell_A}^{\ell^{B_h}} q'(\ell) p \frac{Q(\ell)}{q^2(\ell)} d\ell + \frac{\mu}{p} (c_0 - pc_P). 
\]

(3.29)
The sign of the above equation is still ambiguous. However, if \( \frac{\mu}{p}(c_0 - pc_P) \) is positive, when \( q'(\ell) \geq 0 \), the BTE hourly fee contract increases the settlement probability compared with the unrecoverable ATE conditional fee contract; when \( q'(\ell) < 0 \), compared with the BTE hourly fee contract only if the plaintiff's net gain from settlement \( S_{BH}^{BH} - S_A^{A} \) is greater than his expected net cost \( \frac{\mu}{p}(c_0 - pc_P) \) the unrecoverable ATE conditional fee contract increases the settlement probability.

There are some interesting results for the uniform distribution. When \( q' = 0 \) the comparison between (3.29) and (3.22) gives \( \ell^{A_\kappa^*} - \ell^{A^*} = 0 \), we therefore establish:

**Result 3.9.** If the accident loss is uniformly distributed, the plaintiff has the same equilibrium acceptance level whether the ATE conditional fee contract recovers his premium and success fee or not.

The defendant's *ex ante* welfare is:

\[
W_D = [1 - \pi(x)](y_D - x) + \pi(x)(y_D - x - H^*) = y_D - x - \pi(x)H^*.
\]

Since the accident probability \( \pi \) is affected by the acceptance level \( \ell \) through \( x \), the defendant's *ex ante* welfare can either increase or decrease when the acceptance level increases. This depends on the specific accident probability function \( \pi \). Therefore, the comparison between the defendant's *ex ante* welfare is ambiguous.
We now go to the plaintiff’s welfare. Since the sign of $\ell^{B*} - \ell^{A*}$ remains ambiguous, we have to analyze the plaintiff’s welfare under some special situations. With a uniform loss distribution, $S^{Bh} = S^A$. The difference between the acceptance levels become $\ell^{B*} - \ell^{A*} = \frac{p}{L_1}(c_0 - pc_P)$. The ex post welfare difference becomes:

$$W_{B*} - W_{A*} = \alpha_A - \alpha_B + \mupc_p + Q(\ell^{A*})(\mu c_0 - \mu c_p)$$

$$+ p \int_{\ell^{B*}} \text{LdQ} + [Q(\ell^{B*}) - Q(\ell^{A*})](S - c_0)$$

$$= \alpha_A - \alpha_B + \mu c_p + \frac{p(\ell^{B*} - \ell^{A*})}{L_1} \ell^{A*}$$

$$- \frac{p(\ell^{B*} - \ell^{A*})(\ell^{B*} + \ell^{A*}) + \frac{p(\ell^{B*} - \ell^{A*})}{L_1} \ell^{B*}}{2L_1}$$

$$= \alpha_A - \alpha_B + \mu c_p + \frac{(\mu c_0 - \mu c_P)}{2L_1}(\ell^{B*} + \ell^{A*})$$

The comparison of ex post welfare shows that when $p$ is small enough ($c_0 \geq pc_P$), since the ATE premium is higher than the BTE premium, the plaintiff is better off post-accident under the BTE hourly fee contract than under the unrecoverable ATE conditional fee. But if the winning probability is large ($c_0 < pc_P$) the situation is still not clear.

Compare this welfare change with the one under the recoverable policy, note that $\ell^{A*} = \ell^{A*}$ (Result 3.9), we have:

$$W_{A*} - W_{A*} = W_{B*} - W_{A*} - (W_{B*} - W_{A*}) = p(\alpha_A + \mu c_p).$$
The comparison of ex ante welfare between these two contracts is

\[ W_{A_{u*}}^a - W_{A_*}^a = [\pi(\ell^{A_{u*}}) - \pi(\ell^{A*})]y_P + \pi(\ell^{A_{u*}})W_{A_{u*}}^p - \pi(\ell^{A*})W_{A_*}^p. \]

Substituting \( \ell^{A_{u*}} = \ell^{A*} \) and \( W_{A_{u*}}^p - W_{A_*}^p = p(\alpha_A + \mu_P) \), we have

\[ W_{A_{u*}}^a - W_{A_*}^a = \pi(\ell^{A*})p(\alpha_A + \mu_P). \]

**Result 3.10.** Under a uniform loss distribution, the plaintiff is better off ex post and ex ante under the recoverable ATE contract compared with the unrecoverable ATE contract.

The ex ante welfare change between the BTE hourly fee and the unrecoverable ATE conditional fee is:

\[ W_{B_{h*}}^a - W_{A_{u*}}^a = [\pi(\ell^{A*}) - \pi(\ell^{B_{h*}})]y_P - [1 - \pi(\ell^{B_{h*}})]\alpha_B + \pi(\ell^{A*})W_{B_{h*}}^p - \pi(\ell^{A*})W_{A_*}^p. \]

\[ = [\pi(\ell^{A*}) - \pi(\ell^{B_{h*}})]L - [1 - \pi(\ell^{B_{h*}})]\alpha_B + \pi(\ell^{A*})[W_{B_{h*}}^p - (y_P - L)] - \pi(\ell^{A*})[W_{A_*}^p - (y_P - L)]. \]

Since the ex post welfare comparison does not derive a clear result, the comparison of the ex ante welfare is also ambiguous.

### 3.4.4 Dynamic extension

We now extend our ATE vs BTE model (Section 3.3) to a dynamic setting. Our interest is in the effects of BTE and ATE on the terms and timing of settle-
ment. Following Spier (1992) and Fenn, Gray, Rickman & Carrier (2002), we examine the Perfect Bayesian Equilibrium of a finite horizon screening model. In this equilibrium, both plaintiff and defendant choose strategies to maximise expected utility subject to the plaintiff being made indifferent between accepting and rejecting offers between period $t$ and $t+1$.

Now, pre-trial bargaining can take place over $T$ periods, in each of which the defendant can make a settlement offer $S_t$. Acceptance of any of these ends the game while rejection of every offer brings the case to trial, in period $T+1$. Each period of pre-trial bargaining costs the defendant and the plaintiff $C_q$ and $C_q$ respectively; trial costs them $c_t^D$ and $c_1$. The discount factor $\delta$ is common knowledge for both parties. For simplification, we assume the accident loss is uniform distributed $L \in [L_0, L_1]$.

We start from BTE hourly fee arrangement. The plaintiff’s current value payoff at trial:

$$U^{PB}(T+1) = pL.$$  \hspace{1cm} (3.30)

The defendant’s trial payoff is:

$$U^d(T+1) = -pE(L|T+1) - p(f_T^D + f_T^P)$$  \hspace{1cm} (3.31)

where $E(L|T+1)$ is the expected loss conditional on reaching trial. $f_T^D$ is the defendant’s total legal costs $f_T^D = c_t^D + \sum \delta^{-i}c_0^D$. Similarly, $f_T^P$ is the plaintiff’s total legal costs $f_T^P = c_1 + \sum \delta^{-i}c_0$. 

108
The derivation of this model is documented in Appendix of this chapter in full detail. The Perfect Bayesian Equilibrium (PBE) of the BTE hourly fee game with $2 \leq T \leq \infty$ is:

$$\ell_{1}^{B} = L_{0} \quad (3.32)$$

$$\ell_{t}^{B} = \ell_{t-1}^{B} + \frac{C_{0} + C_{D}}{\delta^{T-t+1}p}, \quad t = 2, ..., T \quad (3.33)$$

$$S_{1}^{B} = \delta^{T}p(L_{0} + C_{1} + C_{D}) + \delta^{T}p\left(\sum_{i=1}^{T} \delta^{-i}C_{0} + \sum_{i=1}^{T} \delta^{-i}C_{0}\right) + \sum_{i=1}^{T} \delta^{i}C_{D} \quad (3.34)$$

$$S_{t}^{B} = \delta^{1-t}S_{1}^{B} + \sum_{i=2}^{t} \delta^{2-i}C_{0}, \quad t = 2, ..., T \quad (3.35)$$

Now we turn to the ATE conditional fee arrangement. Here, the plaintiff's legal costs become $f_{t}^{P} = (1 + \mu)c_{1} + \sum \delta^{-i}(1 + \mu)c_{0}$. When the litigants make the settlement decision, they have to consider the recoverable insurance premium $\alpha_{A}$. This is also reflected in the plaintiff's current value payoff $U_{t}^{PA}(T+1) = p(L + \alpha_{A})$. Following the same method as before, we can write the PBE of the ATE conditional fee litigation game:

$$\ell_{1}^{A} = L_{0} \quad (3.36)$$

$$\ell_{t}^{A} = \ell_{t-1}^{A} + \frac{(1 + \mu)c_{0} + C_{D}}{\delta^{T-t+1}p}, \quad t = 2, ..., T \quad (3.37)$$
\[ S_t^A = \delta^t p L_0 + \delta^t p [c^D_t + (1 + \mu)c_1 + \alpha_A] + \sum_{i=1}^{T} \delta^i c^D_0 \]

\[ + \delta^t p [\sum_{i=1}^{T} \delta^{-i} c^D_0 + \sum_{i=1}^{T} \delta^{-i} (1 + \mu)c_0] \quad (3.38) \]

\[ S_t^A = \delta^{t-i} S_{i-1}^A + \sum_{i=2}^{t} \delta^{2-i} (1 + \mu)c_0, \quad t = 2, ..., T \quad (3.39) \]

To note that when setting \( T = 1 \), (3.34) and (3.38) return to our one-shot game results of Section 3.3. Comparing the BTE hourly fee with the ATE conditional fee, given \( \alpha_A > 0 \) and \( \mu \geq 0 \), it is clear that \( S_t^A > S_t^B \) and \( S_t^A > S_t^D \). This result is consistent with Result 3.8. We conclude:

**Result 3.11.** In the dynamic model, the ATE conditional fee contract increases the defendant's settlement offer compared with the BTE hourly fee contract.

Next, consider the timing of the settlement, which requires us to examine the probability of settling in each period. Following Fenn & Rickman (1999), the conditional probability of settling is given by a hazard function:

\[ \lambda(t) = \frac{(1 - \delta)\beta^t - \delta^{t-T}}{(1 - \delta)\beta^t - \delta^{t-T} - \delta^t - \delta^{t-T}} \quad (3.40) \]

where \( \beta^t, i = A, B \) is a fee specific function defined as follows: for the BTE hourly fee contract \( \beta^B = p(L_1 - L_0)/(c_0 + c^D_0) \) and for the ATE conditional
fee contract \( \beta^A = \frac{p(L_1 - L_0)}{((1 + \mu)c_0 + c^D)}. \) Since \( \beta^A < \beta^B \), we have:

**Result 3.12.** In the dynamic model, the ATE conditional fee contract leads to a faster settlement compared with the BTE hourly fee contract.

In our one-shot model (Section 3.3), there is no certain conclusion on the settlement probability. The difference here reflects the property of the dynamic model. When there are \( T \) periods of pre-trial bargaining, as shown in (3.35) and (3.39), the plaintiff’s pre-trial legal costs (the second term in each equation) become a main concern in the defendant’s settlement offer decision. Therefore, in the dynamic model, the settlement offer is always higher than in the one-shot model. The reason for this is the plaintiff’s pre-trial legal costs \( f^{*} \). This would be substituted into the one-shot model (e.g. equation (3.22)), the similar result would emerge.

### 3.5 Summary and conclusions

In this chapter, we initiated the research of combined effects of legal expenses insurance and conditional fees. We first set up a general one-shot model to analyse the effects of legal insurance on settlement. We found that given the defendant’s settlement offer, the insured plaintiff has a lower settlement probability. This confirmed the results of early literature (e.g. Heyes et al. (2004)). However, when considering the defendant’s interaction, the effects of insurance on the settlement probability is ambiguous. This is because the distribution of the accident loss plays an important role in the defendant’s settlement offer. When the distribution of the accident loss is convex (concave), the defendant
will make a lower (higher) settlement offer to the insured plaintiff than to the self-funded plaintiff. Also, insurance increases the defendant's care level if and only if it reduces the plaintiff's acceptance level. Thus, when insurance reduces the settlement offer, it reduces care and increases the accident probability.

We then focused on combinations of legal expenses insurance and fee arrangements. We specified two combinations, the BTE hourly fee and the ATE conditional fee, and compared their effects on litigation. We concluded that given the defendant's settlement offer, compared with the BTE hourly fee contract, the ATE conditional fee contract lowers the plaintiff's acceptance level. However, the defendant's settlement offer still depends on the accident loss distribution.

To remove some ambiguities, we examined the uniform distribution. In this case, we found that the BTE plaintiff has a higher acceptance level. After discussions of risk aversion and unrecoverable success fees, we extended the one-shot model to a dynamic one to examine the combined effects of insurance and fee arrangement on the timing of settlement. We found that the ATE conditional fee contract increases the defendant's settlement offer compared with the BTE hourly fee contract.

However, as in other research on fees and litigation, a number of our results imply ambiguity in the comparisons, especially these welfare results. This reflects a fundamental complexity in the underlying relationship we model but, for this reason, such ambiguity should not be ignored: policy needs to be carefully considered, with suitable opportunities or empirical evaluation. These
issues will be discussed in Chapter 5.
Derivation of the dynamic model

Consider a $T = 1$ game. The plaintiff accepts a given settlement offer $S$ if and only if

$$S - c_0 \geq \delta p \ell_2,$$

which define the acceptance level

$$\ell_2^B = \frac{1}{\delta p} (S - c_0), \quad (3.41)$$

The defendant chooses the settlement offer $S$ to minimise his expected post-accident cost $H$. For the BTE hourly fee contract, this cost is given by

$$H^B_{\text{h}} = Q(\ell_2)S + [1 - Q(\ell_2)]\delta p(f_1^D + f_1^P) + \delta p \int_{\ell_2}^{L_1} LdQ.$$

The First Order Condition defining the optimal settlement offer $S$ is:

$$Q(\ell_2) + \frac{q(\ell_2)}{\delta p} [S - \delta p \ell_2 - \delta p(f_1^D + f_1^P)] = 0.$$

Since $L$ is uniform distribution, $Q(\ell) = \frac{\ell - \ell_0}{L_1 - \ell_0}$ and $q(\ell) = \frac{1}{L_1 - \ell_0}$. Therefore

$$S^B = \delta p L_0 + \delta p(f_1^D + f_1^P) \quad (3.42)$$

Appendix:
Substituting for $S$ from (3.41) and rearranging gives:

$$\ell_2^B = L_0 + f_1^D + f_1^P - \frac{c_0}{\delta p}. \quad (3.43)$$

Now consider the $T=2$ game. In $t=2$, based on (3.43) we have:

$$\ell_3^B = \ell_2^B + f_2^D + f_2^P - \frac{c_0}{\delta p} - \frac{c_0}{\delta^2 p}. \quad (3.44)$$

Also, in the second period we have

$$S_2 - c_0 - \frac{c_0}{\delta} = \delta p \ell_3. \quad (3.45)$$

The plaintiff's indifference between period 1 and 2 requires $S_1 - c_0 = \delta(S_2 - c_0) - c_0$, which gives

$$S_2 = \frac{S_1}{\delta} + c_0. \quad (3.46)$$

Substituting this into (3.45), we obtain:

$$\ell_3^B = \frac{S_1}{\delta^2 p} - \frac{c_0}{\delta^2 p}. \quad (3.47)$$

Hence, (3.44) becomes

$$\ell_2^B = \frac{S_1}{\delta^2 p} + \frac{c_0}{\delta p} - f_2^D - f_2^P. \quad (3.48)$$

Now the defendant chooses the settlement offer $S_1$ to minimise his expected
post-accident cost \( H \), which is given by

\[
H = Q(\ell_2)S_1 + c_0^D + [Q(\ell_3) - Q(\ell_2)]\delta S_2 + [1 - Q(\ell_2)]\delta c_0^D + [1 - Q(\ell_3)]\delta^2 U^d(3).
\]

Using the Envelope theorem, the First Order Condition is:

\[
Q(\ell_2) + \frac{q(\ell_2)}{\delta^2 p} S_1 - \frac{q(\ell_2)}{\delta^2 p} \delta(\frac{S_1}{\delta} + c_0 + c_D^d) = 0.
\]

Given that \( L \) is uniformly distributed, the above equation becomes:

\[
\ell_2^B = L_0 + \frac{c_0 + c_D^d}{\delta p}.
\]  (3.49)

Using (3.49) in (3.44) gives

\[
\ell_2^B = L_0 + \frac{c_0^D}{\delta p} + f_2^D + f_2^P - \frac{c_0}{\delta^2 p}.
\]  (3.50)

Substituting this into (3.47) yields

\[
S_1^B = \delta^2 p L_0 + \delta^2 p (f_2^D + f_2^P) + \delta c_0^D
\]  (3.51)

so that (3.46) gives

\[
S_2^B = \delta p L_0 + \delta p (f_2^D + f_2^P) + c_0^D + c_0
\]  (3.52)

We now assume there are \( T \) periods pre-trial. Letting \( S_1 \) for the \( T + 1 \) period game be \( S_2 \) for the \( T + 1 \) period game, we have

\[
S_2 = \delta^{T-1}(p\ell_2 + f_2^D + f_2^P) + \sum_{i=1}^{T-1} \delta^i c_0^D
\]  (3.53)
Since \( S_2 = S_1/\delta + c_0 \), the above equation can be changed to:

\[
\ell_2 = \frac{S_1}{\delta^{T-1}p} + \frac{c_0}{\delta^{T-1}p} - \sum_{t=1}^{T-1} \frac{\delta^t c_D^P}{\delta^{T-1}p} - f_P^R - f_T^R
\]

(3.54)

The defendant minimises

\[
Q(\ell_2)S_1 + c_D^P + [Q(\ell_3) - Q(\ell_2)]\delta S_2 + [1 - Q(\ell_2)]\delta c_D^P + ...
\]

\[
... + [1 - Q(\ell_{T+1})]\delta^2 U^d(T + 1).
\]

and the First Order Condition is

\[
\ell_2 = L_0 - \frac{S_1}{\delta^{T-1}p} + \frac{S_2 + c_D^P}{\delta^{T-1}p}.
\]

Using \( S_2 = S_1/\delta + c_0 \) this yields

\[
\ell_2 = L_0 + \frac{c_0 + c_D^P}{\delta^{T-1}p}.
\]

Substitution in (3.54) gives

\[
S_1^B = \delta^T p L_0 + \delta^T p (f_D^P + f_T^P) + \sum_{i=1}^{T} \delta^i c_D^P
\]

In summary, we can write the Perfect Bayesian Equilibrium (PBE) of the BTE hourly fee game with \( 2 \leq T \leq \infty \) as:

\[
\ell_1^B = L_0
\]

(3.55)
\[ \ell_t^B = \ell_{t-1}^B + \frac{c_0 + c_0^D}{\delta^{T-t+1} p}, \quad t = 2, \ldots, T \]  

(3.56)

\[ S_1^B = \delta^T p (L_0 + c_1 + c_1^D) + \delta^T p \left( \sum_{i=1}^{T} \delta^{-i} c_0^D + \sum_{i=1}^{T} \delta^{-i} c_0 + \sum_{i=1}^{T} \delta^i c_0^D \right) \]  

(3.57)

\[ S_t^B = \delta_1^B S_1^B + \sum_{i=2}^{t} \delta_{t-i}^B c_0, \quad t = 2, \ldots, T \]  

(3.58)
Chapter 4

Legal effort and organisational structures of the law firm
4.1 Introduction

As discussed in previous chapters, market responses to litigation risk vary across countries. In the US, it is common for plaintiffs to retain lawyers on a contingent basis thereby shifting some risk on costs to their agent. Alternatively, the majority of European jurisdictions have well developed insurance markets where protection against the risk of legal expense can be purchased. In England and Wales, there are two implementations to protect litigants. Legal expenses insurance can be purchased in the market and conditional fee contracts can be signed with the legal service provider. However, within current regulatory framework, the insurance provider normally cannot be the legal service provider.\(^1\) Policy makers are considering removing this restriction. This proposal is welcomed by some big law firms. Reform enables the possibility of adopting an alternative organisational structure which may allow law firms to integrate with financial service providers (Clementi 2004). However, a critical question arises: how does the alternative organisational structure affect the incentives of lawyers to act in the best interests of clients?

To answer this question the functioning of relevant firms should be carefully examined. The modern approach to the theory of the firm emphasizes the firms’ three roles\(^2\): first, a nexus of contracts (Jensen & Meckling (1976));

\(^1\)According to Vidal, Jewitt & Leaver (2005), in England and Wales a little under a quarter of the solicitors with practising certificates are “in-house”. They are employed in commerce/industry, government or the prosecution service. The primary difference between employed solicitors and those in private practice is that the former can only provide services for their employer and not for third party clients. In the case of insurance, most insurers send all claims to external solicitors for claims handling. Very few of them operate in-house claims handling functions, limited to non-personal injury motor claims or low value claims below the small claims limit (Abrams 2002).

\(^2\)See Hart (1995) for the previous review.
second, a property right over a set of assets (Grossman & Hart (1986), Tirole (1988) and Hart & Moore (1990)); and third, an incentive system (Holmstrom & Milgrom (1994) and Holmstrom (1999)). In the case of a law firm, since partnership is the prevailing organisational structure\(^3\), its assets are special. As pointed out by Grout (2005), the asset of a law firm is mainly its human capital. If an alternative organisational structure is allowed, financial capital from outside ownership may change the former effects of human capital. Problems like moral hazard and adverse selection may arise. Based on the property right model, several studies (see Brealey & Franks (2005), Davies (2005), Dow & Lapuerta (2005) and Grout (2005)) illustrate the possible risks and benefits of introducing an alternative organisational structure. Nevertheless, there is no study that looks at the incentive effects of the law firm’s organisational structures in detail. Currently in the UK, law firms work with insurance companies mainly in two ways: practise independently or join the insurer’s panel (Abrams 2002). If the partnership restriction is relaxed, it is possible that an integrated firm which provides both financial and legal services will come into being.\(^4\) The implications of these arrangements are first examined in this chapter.

We proceed as follows. In the next section we set out the basic model of legal effort. As adopted by Rickman & Tzavara (2005), we use the contest success function to illustrate the competitive choice of effort by lawyers. We

\(^{\text{3}}\)The law firm is an arrangement in which a group of lawyers form a joint venture. Members share assets and liabilities, receipts are paid to the firm, and after the payments of expenses which include lawyers’ salaries, the members of the firm distribute the net income amongst themselves according to a formula previously agreed on. If the law firm is organised as an equal partnership, all partners will share the net income equally.

\(^{\text{4}}\)Climenti (2004) stopped short of recommending such integration, though he did not rule out such “multi-disciplinary partnership” in future.
will show how organisational structure and ownership influences the law firm’s effort decisions in detail in Section 4.3. After that, we examine the welfare effects of the change to organisational structures. Using the conclusions of Sections 4.2 and 4.3, we compare litigants’ *ex post* and *ex ante* welfare under different organisational structures. In Section 4.5, we draw conclusions and suggest some further studies.

### 4.2 The model

#### 4.2.1 The basic model

Our basic model describes an agency relationship between a law firm and an insurance company. When a legal expenses insurance policyholder (potential plaintiff) is involved in an accident, he may retain a law firm to start a lawsuit. We assume this law firm is organised by equal partnership, which means all the lawyers in the firm share risk and benefit equally.\(^5\) In this basic model, we define the law firm as independent from the insurer. In the next section, we will discuss the situations when the law firm integrates with the insurer.

We start from assumptions and model settings. The plaintiff and the defendant are assumed to be ignorant about legal matters: they can observe their lawyers’ legal effort but because of lacking professional knowledge they do not know how much effort their respective cases need.\(^6\) This is the typical expertise problem introduced by Dana & Spier (1993) and Emons (2000). The outcome

---

\(^5\)By this setting, we can treat the firm as a whole and avoid the complexity of hierarchical structure and free riding.

\(^6\)Under this assumption, legal service is a credence good, see Emons (2001).
of the lawsuit is a function of the law firm’s legal effort. For legal effort, following Schwartz & Mitchell (1970), we define the lawyer’s hourly input into the case. We assume the lawyer puts the same “effort” into each hour worked. Hence, the quality of each hour’s work is the same (though its marginal productivity is assumed to be declining). According to current laws, regulations and restrictions, the insurer can not directly affect the law firm’s effort decision. If the plaintiff wins the lawsuit, he will receive a judgement which can be different from his claimed loss. However, since in an English cost rule jurisdiction the losing party needs to pay the winning party’s legal costs, if the insured plaintiff loses the lawsuit, his insurer has to pay the defendant’s costs. In England and Wales, there are strict restrictions on the law firm’s available fee arrangements. Currently, law firms will typically charge either on an hourly basis or on a conditional fee basis. However, Peysner (2001) notes that insurers will often lead firms to charge on an “eat what you kill” basis where firms are paid a fixed fee plus an hourly fee if the case is won and only a fixed fee if the case is lost. We therefore allow for this as well. We assume that the insurer, instead of the law firm, decides the fee arrangement. Moreover, for simplification, we assume the hourly rate of the lawyer \(w\) is an exogenous parameter.

The extensive form of our game consists of three stages (see Figure 4.1):

1. “Nature” determines whether the potential plaintiff is involved in an accident with probability \(\pi\).\(^7\) If not, the game ends. Otherwise, the plaintiff reports to the insurer and retains a law firm;

2. The insurer chooses the payment contract (fee arrangement) that deter-

\(^7\)In the welfare analysis section we relax this assumption and consider an endogenous \(\pi\).
mines what the law firm is paid;

3. The plaintiff’s law firm and the defendant’s lawyer play a litigation sub-game by choosing their effort $\tau$ and $\tau_D$ respectively.\(^8\)

It is instructive to compare this model to the one in Chapter 3. The model here is a combination of two games: the litigation game between the plaintiff and defendant lawyers and the contracting game between the insurer and the law firm. However, in Chapter 3, we only focus on the litigation game between the plaintiff and the defendant. In the current model, the plaintiff, who can observe the law firm’s legal effort, but is assumed to be ignorant how much is actually required by the case, does not participate in the litigation subgame. In Chapter 3, we look into the combined effects of legal expenses insurance and

\(^8\)We assume that the English cost rule is applied in the litigation.
fee arrangement. While in this chapter, we focus on the lawyer’s legal effort provision and the effects of the law firm’s organisational structures.

We now define the litigation subgame. In this subgame, the plaintiff’s law firm and the defendant’s lawyer make their effort decisions simultaneously. Following Rickman & Tzavara (2005), we define the plaintiff’s probability of winning the lawsuit as a contest success function:

\[ p(\tau) = \frac{\tau}{\tau + \theta T_D}, \] (4.1)

where \( \tau \) is the plaintiff’s law firm’s legal effort, \( T_D \) is the defendant’s lawyer’s legal effort and \( \theta \) represents the difficulty of the case for the plaintiff. A more difficult case reduces the plaintiff’s probability of winning \( p(\tau) \) if the defendant’s legal effort \( T_D \) does not change. The legal effort decisions are made by the lawyers solely, neither the ignorant litigants nor the insurer can directly affect them. We also assume the plaintiff’s law firm and the defendant’s lawyer make their effort decisions simultaneously.

### 4.2.2 The law firm

Worker-cooperative ownership, i.e. partnership, is a typical organisational structure in most skilled service industries (e.g. law, accounting, consultancy).

Unlike other industries, while firms in these skilled service industries have

---

9In economic literature, contest success functions are firstly defined by Tullock (1975) and developed by Hirshleifer (1989) and Skaperdas (1996). The function in our model is similar to the one in Skaperdas (1996).

10In the model of Chapter 3, the plaintiff’s probability of winning is an exogenous parameter, while in the current model it is an endogenous variable. Therefore, in these two chapters, we use different variables to represent the difficulty of the case.
physical assets, their most important assets are the human capital of their workers. Law firms’ human capital can be separated into two parts: reputation and business-specific human capital. Reputation is one of the legal service industry’s key assets, offering attractive returns when cultivated properly, but threatening considerable damage if lost. Obviously, more wins in lawsuits raises this reputation. Hence, we assume the firm’s reputation is an increasing function of the probability of winning the lawsuit. The business-specific human capital is the human capital that can increase the law firm’s market value, e.g. lawyers’ training experiences and professional certifications. Investment in the business-specific human capital can increase the firm’s value but does not change the firm’s output.\footnote{Effectively, this is a “strong” version of the Spence (1973) signaling model. It allows us to ignore the effects of human capital on the current litigation itself.} The law firm’s income is mainly from its legal fees. The firm also needs to bear the cost/disutility of its legal effort and costs. A risk neutral law firm’s utility function is given by:

\[ U^L = f + \nu_R + \nu_B - \phi_1 - \phi_B - C_L \]  

where \( f \) is the legal fee income, \( \nu_R \) is the reputation asset, \( \nu_B \) is the business-specific human capital, \( \phi_1 \) is the disutility of legal effort, \( \phi_B \) is the cost of investment in the business-specific human capital, and \( C_L \) is the firm’s running cost which is assumed to be a constant. We define legal fee income as follows:

\[ f = pf^w + (1 - p)f^0 = \frac{\tau}{\tau + \theta_\tau D} f^w(\tau) + \frac{\theta_\tau D}{\tau + \theta_\tau D} f^0(\tau) \]

where \( f^w \) is the fee to the law firm if the case is won and \( f^0 \) is the fee if the case is lost. Both of these are functions of legal effort \( \tau \). For convenience, we
let the disutility of effort is $\phi_1 = \frac{1}{2} \tau^2$. We assume the reputation asset is

$$\nu_R = \nu_1 p = \nu_1 \frac{\tau}{\tau + \theta \tau_D}$$

where $\nu_1$ is the reputation return to the probability of winning.

The business-specific asset is given by

$$\nu_B = \nu_2 e$$

where $e$ is the firm’s input to the business-specific human capital and $\nu_2$ is its return rate. Similar as $\phi_1$, we assume the cost of this investment is $\phi_2 = \frac{1}{2} e^2$ for convenience.

With the above assumptions, if the law firm owns all the assets its utility function becomes

$$U^L = \frac{\tau}{\tau + \theta \tau_D} f^w(\tau) + \frac{\theta \tau_D}{\tau + \theta \tau_D} f^0(\tau) + \nu_1 \frac{\tau}{\tau + \theta \tau_D} + \nu_2 e - \frac{1}{2} \tau^2 - \frac{1}{2} e^2 - C_L. \quad (4.3)$$

### 4.2.3 Nash equilibrium of the litigation subgame

As discussed in Section 4.2.1, in the litigation subgame the plaintiff retains the law firm (PL) while the defendant retains a lawyer (DL). We assume DL is risk neutral and charges hourly fees. His utility function therefore is given by:

$$V^L = w \tau_D - \frac{1}{2} \tau_D^2 - C_D. \quad (4.4)$$
where $w$ is his hourly rate, $\frac{1}{2}r_D^2$ is the disutility/cost function of legal effort, and $C_D$ is his fixed running cost.

PL's legal effort will affect DL's effort decision only when the latter's utility is a function of the probability of winning. If DL charges hourly fees, his income is independent from the outcome of the lawsuit. Therefore PL's legal effort has no effect on DL's effort decision. DL's reaction function (against the law firm) is obtained by maximizing his utility function $V^L$ with respect to his legal effort $\tau_D$, which is given by:

$$w - \tau_D = 0. \quad (4.5)$$

This reaction function confirms that PL's effort decision does not affect DL's effort choice. In Nash equilibrium, the defendant lawyer's optimal legal effort equals his hourly rate, which is a constant.

$$\tau_D^* = w. \quad (4.6)$$

Now we move to the plaintiff's law firm. Two variables contribute to PL's utility function: legal effort $\tau$ and human capital input $e$. In Nash equilibrium, the firm chooses the optimal values of $\tau$ and $e$ to maximize its utility function $(4.3)$. The firm's reaction functions (against the defendant) are:

$$\nu_2 - e = 0; \quad (4.7)$$

$$\frac{\theta \tau_D}{(\tau + \theta \tau_D)^2} f^w(\tau) - \frac{\theta \tau_D}{(\tau + \theta \tau_D)^2} f^0(\tau) + \frac{\tau f^w(\tau)}{\tau + \theta \tau_D} + \frac{\theta \tau_D f^0(\tau)}{\tau + \theta \tau_D} + \frac{\nu_1 \theta \tau_D}{(\tau + \theta \tau_D)^2} - \tau = 0. \quad (4.8)$$
Since the human capital input $e$ does not affect the outcome of the case, in equilibrium it is equal to its marginal return:

$$e^* = \nu_2.$$ (4.9)

Substituting DL’s equilibrium effort choice $\tau_D^* = w$ into PL’s reaction function (4.8), we have:

$$\frac{\theta w}{(\tau + \theta w)^2} f^w(\tau) - \frac{\theta w}{(\tau + \theta w)^2} f^0(\tau) + \frac{\tau f^w(\tau)}{\tau + \theta w} + \frac{\theta w f^0(\tau)}{\tau + \theta w} + \frac{\nu_1 \theta w}{(\tau + \theta w)^2} - \tau = 0.$$ (4.10)

The Nash equilibrium of the litigation subgame therefore is the solution of equation (4.10): $\tau^*, e^* = \nu_2$ and $\tau_D^* = w$.

From equation (4.10), we can find that the law firm’s optimal effort choice is decided by the difficulty of the case $\theta$, the return to the reputational asset $\nu_1$, and the fee arrangement $f^w$ and $f^0$. Since $f^w$ and $f^0$ are functions of $\tau$, only when the fee arrangement is specified, the optimal effort $\tau^*$ can be solved. We will discuss hourly fees, conditional fees and their effect on the firm’s effort provision in Section 4.3.

Moreover, two implications can be gained from (4.10). First, when $\theta = 0$, which means the plaintiff wins at trial, the optimal effort is given by $\tau = f^w$. In this case, only the winning fee $f^w$ will affect the effort decision. Second, when $\theta \rightarrow +\infty$, which means the defendant wins at trial, the optimal effort is $\tau = f^0$. For conditional fees, since $f^0 = 0$, we can find that the firm will not provide any effort.
4.2.4 Litigants’ best interests

We now define the plaintiff’s utility. Since the plaintiff is insured, he does not need to pay any legal fee.\textsuperscript{12} His \textit{ex post} welfare is:

\[ U^P = y_P - L + pA \]

where \( y_P \) is his initial wealth, \( L \) is the accident loss and \( A \) is the judgement. Note that the plaintiff’s legal costs are covered by insurance. Substituting the Nash solution into this welfare function gives:

\[ U^P = y_P - L + \frac{\tau^*}{\tau^* + \theta w} A = y_P - L + \frac{\tau^*}{\tau^* + \theta w} A. \quad (4.11) \]

As shown in Section 4.2.4, in the above function, the law firm’s optimal legal effort \( \tau^* \) is decided by \( \theta, \nu_1, f_w \) and \( f^0 \). The effect of the law firm’s effort on the plaintiff’s welfare is given by

\[ \frac{dU^P}{d\tau^*} = \frac{\theta w}{(\tau^* + \theta w)^2} A > 0. \]

It is clear that the plaintiff’s \textit{ex post} welfare is increasing with the law firm’s legal effort.

The defendant has an \textit{ex post} welfare function given by

\[ V^D = y_D - p(A + f^D + f) = y_D - p[A + f^D + pf^w + (1 - p)f^0], \quad (4.12) \]

\textsuperscript{12}Notice that, we assume that the plaintiff does not pay a co-payment to the insurer. The reason for this is that the plaintiff does not choose the lawyer’s effort in the current model so this source of moral hazard does not arise.
where $y_D$ is the defendant’s initial wealth and $f^D$ is the defendant’s legal fee. Substituting the Nash solution into the defendant’s welfare function, in equilibrium the defendant’s welfare becomes:

$$V^D = y_D - \frac{\tau^*}{\tau^* + \theta w} \left[ A + w^2 + \frac{\tau^*}{\tau^* + \theta r^*_D} f^w(\tau^*) + \frac{\theta r^*_D}{\tau^* + \theta r^*_D} f^0(\tau^*) \right].$$  \hspace{1cm} (4.13)

The effect of the law firm’s effort on the defendant’s welfare is therefore obtained by:

$$\frac{dV^D}{d\tau^*} = -\left[ \frac{\theta w}{(\tau^* + \theta w)^2} (A + w^2 + f) + \frac{\tau^*}{\tau^* + \theta w} \frac{df}{d\tau^*} \right].$$

Note that $f = \frac{\tau^*}{\tau^* + \theta r^*_D} f^w + \frac{\theta r^*_D}{\tau^* + \theta r^*_D} f^0$, given $f^w \geq f^0$, since $\frac{df}{d\tau^*} = \frac{\theta r^*_D}{(\tau^* + \theta r^*_D)^2} f^w(\tau^*) - \frac{\theta r^*_D}{(\tau^* + \theta r^*_D)^2} f^0(\tau^*) + \frac{\tau^*}{\tau^* + \theta r^*_D} f^w(\tau^*) + \frac{\theta r^*_D}{\tau^* + \theta r^*_D} f^0(\tau^*) > 0$, the defendant’s *ex post* welfare is decreasing with the law firm’s legal effort.

It is clear that litigants’ welfare is affected by the law firm’s legal effort. Therefore, if changes to the law firm’s organisational structure and ownership affect its legal effort provision, they will also affect litigants’ welfare. To summarise:

**Result 4.1:** Changes to the legal service provider’s organisational structure and ownership will affect litigants’ welfare only if they have effects on the provider’s legal effort. Increases in the plaintiff’s legal effort will result in an increase in the plaintiff’s *ex post* welfare but a decrease in the defendant’s *ex post* welfare.

In this section, we set up our basic model and obtained solutions for the
litigation subgame. However, comparison of the effects of fee arrangements and organisational structures requires us to specify them in detail. We now turn to this, taking organisational structures first.

4.3 Organisational effects

In this section, we extend our basic model in two dimensions. First, to highlight lawyers' effort reactions under different legal fees, we specify three fee arrangements: hourly fees, conditional fees and an “eat what you kill” scheme (defined below). Second, in addition to the independent law firm we allow two types of integration to examine the effects of organisational structure and ownership changes. We now define the three types of law firm.

**Independent firm** is the typical law firm in private practice where lawyers are partners of the firm. The firm is operated independently from the insurer. All assets of the firm are controlled by its partners.

**Type I integration** is the situation where the insurer merges with the law firm. In this case, the former assets of the law firm and the benefits of these assets move to the insurer, while the law firm provides legal service but receives only legal fees which are paid by a losing defendant via the insurer, or by the insurer if the case is lost (under hourly fees). In Type I integration, lawyers lose the control of their former assets.

**Type II integration** is the situation where the law firm merges with the insurer and controls the insurer's assets. This, of course, would be the situation where the law firm provides legal expenses insurance services.13

---

13This setting is to accommodate one possible form of multi-disciplinary practices in
In this case the ownership of the former law firm assets moves to the new firm and the new firm has to bear the (insured) risk.

The Independent firm reflects the typical situation in the UK at present, while Type I and Type II integration are more hypothetical. We introduce them to capture effects of the possible legal reform. Thus, both share multi-disciplinary elements (through outside capital/ownership), with the the former resembling an in-house set-up in a liberalised market where such businesses can offer legal services. The key difference between them relates to whether lawyers own their firms’ assets (Type II) or not (Type I). Also, these two types of integration can be seen as downstream (of the insurer) and upstream (of the law firm). The following table shows the structure of this section.

<table>
<thead>
<tr>
<th></th>
<th>Hourly fees</th>
<th>Conditional fees</th>
<th>“Eat what you kill”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independent firm</td>
<td>Section 4.3.1.1</td>
<td>Section 4.3.1.2</td>
<td>Section 4.3.1.3</td>
</tr>
<tr>
<td>Type I firm</td>
<td>Section 4.3.2.1</td>
<td>Section 4.3.2.2</td>
<td>Section 4.3.2.3</td>
</tr>
<tr>
<td>Type II firm</td>
<td></td>
<td></td>
<td>Section 4.3.3</td>
</tr>
</tbody>
</table>

4.3.1 Independent law firm

We first study the situation where the plaintiff’s law firm is independent of the insurance company. We use three specified fee settings to examine the fee effects on the law firm’s effort choice.

---

Clementi’s report. We do not examine the possibility that law firms may have the capital to provide insurance services.
For the case of an independent law firm, since it owns its assets, the insurer has the utility function:

\[ U^I = \alpha - \pi (1 - p)(f^D + f) - C_I \]

where \( \alpha \) is the plaintiff's (BTE) legal expenses insurance premium, \( \pi \) is the probability of the accident and \( C_I \) is the insurance company's running cost. Using the Nash solution for the defendant's legal effort \( \tau_D^* = w \), we have \( f^D = w \tau_D^* = w^2 \). Substituting this into \( U^I \) yields:

\[ U^I = \alpha - \pi \frac{\theta w}{\tau + \theta w} \left( w^2 + \frac{\tau}{\tau + \theta w} f^w + \frac{\theta w}{\tau + \theta w} f^0 \right) - C_I \]  

(4.14)

### 4.3.1.1 Hourly fee

If the law firm charges hourly fees, the specified fee setting becomes \( f^w = f^0 = w \tau \). Therefore the law firm has the utility function:

\[ U^{L1} = w \tau + \nu_1 \frac{\tau}{\tau + \theta \tau_D} + \nu_2 e - \frac{1}{2} \tau^2 - \frac{1}{2} e^2 - C_L. \]  

(4.15)

Clearly, the optimal human capital input \( e^* \) always satisfies (4.9) because \( e \) is independent from \( \tau \). From (4.10) we find that in Nash equilibrium the law firm's optimal legal effort level is given by the solution to

\[ w + \nu_1 \frac{\theta w}{(\tau^* + \theta w)^2} - \tau^* = 0. \]  

(4.16)

Figure 4.2 shows the independent law firm's optimal legal effort against the
Figure 4.2: Legal effort of the independent firm under hourly fee

difficulty of the case. From the figure we find that the law firm's legal effort first increases with the difficulty of the case to its maximum then decreases against the difficulty. This is because a low level of difficulty makes effort productive in terms of the probability of winning so that effort also yields a high reputation return. As difficulty rises, this effect diminishes and, eventually, there is insufficient reputation benefit to justify high effort.

For convenience, all numerical calculations assume that the return to reputation and the wage rate are unity: \( \nu = w = 1 \).

The value of the effort is given by

\[
\tau = \frac{1}{6} \left[ 24 \theta w^3 + 24 \theta^2 w^3 + 8 \theta^3 w^3 + 108 \theta w + 8 w^3 + 12 \theta \left( 81 \theta^2 w^2 + 36 \theta^2 w^4 + 36 \theta w^3 + 12 \theta w^4 \right) + 12 \theta^2 w^4 \right]^{1/3} + 6 \left( \frac{2}{9} \theta w^2 + \theta \theta w^2 + \frac{1}{3} \theta w^3 \right) \left[ \frac{24 \theta w^3 + 24 \theta^2 w^3 + 8 \theta^3 w^3 + 108 \theta w + 8 w^3 + 12 \left( 81 \theta^2 w^2 + 36 \theta^2 w^4 + 36 \theta w^3 + 12 \theta w^4 \right) + 12 \theta^2 w^4 \right]^{1/3} + (1/3)w - (2/3)\theta w.
\]

135
4.3.1.2 Conditional fee

If the independent law firm charges a conditional fee, the only risk left to the insurer is the defendant's legal fees when the case is lost since the conditional fee contract is "no win, no fee" and the English cost rule shifts the winner's legal costs to the loser. Given the proportional fee mark-up $1 > \delta > 0$, the law firm and the insurer's utility functions are specified as follows:\(^{16}\)

$$U^{L1} = \alpha - C_I - \frac{\theta w^2}{\tau_1 + \theta w} (w + \tau_1).$$  \hspace{1cm} (4.17)

$$U^{I2} = \alpha - C_I - \frac{\tau \Delta}{\tau + \theta w} (1 + \delta) w + \nu_1 \frac{\tau}{\tau + \theta w} + \nu_2 e - \frac{1}{2} e_2^2 - C_L$$  \hspace{1cm} (4.18)

$$U^{L2} = \alpha - C_I - \frac{\theta w}{\tau_2 + \theta w} w^2.$$  \hspace{1cm} (4.19)

As in the hourly fee case, here the optimal human capital input $e^*$ continues to satisfy (4.9). Since the defendant's legal effort is $\tau_D^* = w$, the law firm's optimal legal effort is derived by maximizing $U^{L2}$ with respect to $\tau$. The reaction function is given by:

$$\frac{\theta w}{(\tau + \theta w)^2} \nu_1 + \frac{2 \tau (1 + \delta) w}{\tau + \theta w} - \frac{\tau^2 (1 + \delta) w}{(\tau + \theta w)^2} - \tau = 0.$$  \hspace{1cm} (4.20)

Figure 4.3 illustrates the firm's legal effort against the fee mark-up $\delta$ and the

\(^{16}\)Note that the expression for $U^{I2}$ below assumes that the success fee is 'recoverable', in the language of Chapter 3.
difficulty level $\theta$. We find that the law firm's legal effort is increasing with

$\tau^* = (1/6)[48w^3\theta^2 + 24w^3\theta - 84w^2\theta^2 + 24w^3\theta^2 - 84w^2\theta^2 + 80w^3 + 108w + 8w^3\theta^2$

$+ 24w^3\theta + 8w^3 + 12(-108w^6\theta^3 - 72w^6\theta^5 + 81w^2 + 72w^6\theta^2)$

$+ 36w^4\theta^3 + 36w^4\theta^3 + 36w^4\theta^2 - 126w^4\theta^3 + 12w^5\theta^2 - 36w^4\theta - 126w^4\theta^3$

$+ 12w^4\theta + 12w^4\theta - 36w^6\theta^3 + 45w^6\theta^2 - 12w^6\theta^2 - 12w^6\theta - 48w^6\theta^2$

$- 108w^6\theta^3 + 90w^6\theta^3 + 36w^6\theta^3 + 45w^6\theta^4 + 12w^6\theta^4$

$- 12w^6\theta^4) \theta)]^{1/3} + 6[(2/9)w^2\theta + (2/9)w^2\theta + (1/9)w^2 + (1/9)w^2\theta + (2/9)\theta$

$+ (1/9)\theta^2]/[48w^3\theta^2 + 24w^3\theta - 84w^2\theta^2 + 24w^3\theta^2 - 84w^2\theta^2 + 80w^3 + 108w +$

$8w^3\theta^2 + 24w^3\theta + 8w^3 + 12(-108w^6\theta^3 - 72w^6\theta^5 + 81w^2 + 72w^6\theta^2)$

$+ 36w^4\theta^3 + 36w^4\theta^3 + 36w^4\theta^2 - 126w^4\theta^3 + 12w^5\theta^2 + 36w^4\theta^2$

$- 126w^4\theta^3 + 12w^4\theta - 36w^6\theta^3 + 45w^6\theta^2 - 12w^6\theta^2 - 12w^6\theta - 48w^6\theta^2$

$- 108w^6\theta^3 + 90w^6\theta^3 + 36w^6\theta^3 + 45w^6\theta^4 + 12w^6\theta^4$

$- 12w^6\theta^4) \theta)]^{1/3} + (1/3)w\delta + (1/3)w - (2/3)w$. 

17The solution of the reaction function (4.20) is given by
the proportional mark-up \( \delta \) because here \( \delta \) has a positive incentive effect on
the firm's income.\(^{18}\)

Compare this with the independent law firm's effort under hourly fees \( r_1 \) (which
is represented by the front edge of the surface in Figure 4.3—i.e. that where
\( \delta = 0 \)). We find that, for the same difficulty level, only when \( \delta \) is compar­
avely high do conditional fees generate sufficient incentive for higher legal
effort. We also see the tradeoff between fee mark-up and difficulty under the
conditional fee. The mark-up provides incentives to the law firm to invest in
the case. Given a \( \theta \), an increase in \( \delta \) increases the firm's expected marginal
profit. Moreover, the difficulty of the case exacerbates the no win, no fee risk
faced by the law firm, thereby deterring potential effort investment.

**Result 4.2:** For an independent firm, only when the fee mark-up \( \delta \) is high
enough, do conditional fees motivate more effort than hourly fees.

The law firm makes its legal effort decision by trading off incentives and risks.
Given a risk level \( \theta \), only when the conditional fee mark-up \( \delta \) is high enough
will the law firm input more effort into the case than under hourly fees. The
higher the risk, the higher the fee mark-up needed.

\(^{18}\)This is also shown in the comparative statics where \( \frac{\partial^2 u}{\partial \tau^2} < 0 \) (from the second-order
necessary condition) and \( \frac{\partial u}{\partial \delta} = (\tau + 2\theta w)\tau w > 0 \), accordingly \( \frac{\partial v}{\partial \delta} > 0 \).
4.3.1.3 “Eat what you kill”

The payment contract between the insurer and the firm can become an “eat what you kill” scheme,\(^{19}\) under which the insurer pays the firm a fixed fee \(F\) plus an hourly fee if the case is won and only the fixed fee if the case is lost.\(^{20}\) Under this scheme, the law firm’s utility function becomes:

\[
U_{L3} = \frac{\tau}{\tau + \theta} w \tau + F + \nu_1 \frac{\tau}{\tau + \theta w} + \nu_2 e - \frac{1}{2} \tau^2 - \frac{1}{2} e^2 - C_L. \tag{4.21}
\]

The law firm’s optimal investment in human capital satisfies (4.9). Its optimal legal effort is given by maximizing \(U_{L3}\) with respect to \(\tau\). Given the defendant’s Nash solution \(\tau_D^* = w\), the reaction function is given by

\[
\frac{\theta w}{(\tau + \theta w)^2} \nu_1 + \frac{2 \tau w}{\tau + \theta w} - \frac{\tau^2 w}{(\tau + \theta w)^2} - \tau = 0. \tag{4.22}
\]

It is clear that in the above reaction function the fixed fee \(F\) does not affect the law firm’s effort decision; it only causes a level change to the firm’s total utility. Compared with conditional fees, the reaction function for “eat what you kill” is exactly the same format as if \(\delta = 0\) in the conditional fee case. Since the legal effort under the conditional fee is increasing with \(\delta\), we can conclude that if the independent firm is under an “eat what you kill” scheme its legal effort is less than under a conditional fee.

---

\(^{19}\)This setting attempts to capture some features of unofficial payment contracts between insurance companies and their panel law firms (Abrams 2002).

\(^{20}\)The fixed fee is paid by the insurer but the hourly fee is actually paid by the defendant. If the plaintiff wins, according to the English cost rule, the defendant has to pay the plaintiff’s legal fees. In our case, the defendant pays the fee to the insurer first, then the insurer transfers it to the law firm.
Figure 4.4: Legal effort of the independent firm under “eat what you kill”

Figure 4.4 illustrates the independent firm’s legal effort under the “eat what you kill” scheme. The firm’s legal effort is higher than the defendant’s legal effort when $\theta < 1$. When $\theta > 1$, it is lower than the defendant’s legal effort and decreasing in the difficulty of the case.

Comparing this legal effort $\tau_3^*$ with that under hourly fees $\tau_1^*$, it is clear that

\[ \tau_3^* = (1/6)[-84w^3\theta^3 + 24w^3\theta + 8\theta^4w^3 + 108\theta w + 8w^3 + 12(-36w^6\theta^3 + 45w^6\theta^4 - 12w^6\theta^5 + 81\theta^2w^2 + 36w^4\theta^2 - 126w^6\theta^3 + 12w^6\theta + 12\theta^4w^4)^{1/3}] + 6[(2/3)w^2\theta + (1/9)\theta^2w^2 + (1/9)\theta^2w^2]/(-84w^3\theta^2 + 24w^3\theta + 8\theta^4w^3 + 108\theta w + 8w^3 + 12(-36w^6\theta^3 + 45w^6\theta^4 - 12w^6\theta^5 - 12w^6\theta^2 + 81\theta^2w^2 + 36w^4\theta^2 - 126w^6\theta^3 + 12w^6\theta + 12\theta^4w^4)^{1/3}] - (2/3)\theta w + (1/3)w. \]
hourly fees induce higher effort. Therefore we state:

**Result 4.3:** *Compared with conditional fees and hourly fees, the independent law firm has the lowest legal effort when it is contracted on an “eat what you kill” scheme.*

At first sight, this may seem surprising because insurers appear to choose such arrangements and we might expect this to imply some revealed preference for them. Thus, Result 4.3 leads us to reflect upon their decision. One possibility is that this choice may be the results of other factors like the administrative benefits of having firms internalise the costs of collecting fees.

Under this scheme, the insurer’s utility function becomes:

$$U^{I^3} = \alpha - C_I - \pi \left( \frac{\theta w}{\tau_3^*} + \theta w^2 + F \right).$$

(4.23)

In Stage 1 of our basic game, the insurer chooses the fee arrangement that can maximize its utility. Since $F \geq 0$ and $\tau_3^* \geq \tau_3^*$, the insurer prefers conditional fees to “eat what you kill”. However, if the insurer does not have a conditional fee contract in place, the situation becomes ambiguous. Under hourly fees the insurer has to pay the law firm if the case is lost and, hence, the higher effort level in Result 4.3 may bring a higher risk to the insurer. By contrast, under “eat what you kill”, if the case is lost, the insurer does not need to pay the law firm, and this gives a reason for the insurer to welcome the “eat what you kill” scheme. Not surprisingly, the insurer’s decision now depends on the difficulty of the case $\theta$ and the value of the fixed payment $F$. 
4.3.2 Type I integrated firm

In the case of the Type I integrated firm, the insurer acquires the law firm’s assets. Therefore, when the law firm makes its effort decision, it will no longer consider the reputation asset $\nu_R$ and the human capital asset $\nu_B$. However, the law firm still makes its legal effort decision independently while the insurer benefits from the asset ownership. The utility function of the insurer can now be written as:

$$ U^I = \alpha + \pi [\nu_R + \nu_B - (1 - p)(f^D + f)] - C_I $$

Substituting the defendant’s Nash equilibrium legal fee $f^D = w^2$ into $U^I$, we have

$$ U^I = \alpha - C_I + \pi \left[ \nu_1 \frac{\tau}{\tau + \theta w} + \nu_2 e - \frac{\theta w}{\tau + \theta w} (w^2 + f) \right] \quad (4.24) $$

4.3.2.1 Hourly fee

If the law firm charges an hourly fee, using the specified setting that $f^w = f^0 = wr$, the law firm and the insurer have the utility functions respectively as follows:

$$ U^{I4} = f - \phi_1 - \phi_B - C_L = w\tau - \frac{1}{2} \tau^2 - \frac{1}{2} e^2 - C_L \quad (4.25) $$

$$ U^{I4} = \alpha - C_I + \pi \left[ \nu_1 \frac{\tau}{\tau + \theta w} + \nu_2 e - \frac{\theta w}{\tau + \theta w} (w^2 + w\tau) \right] $$

In Nash equilibrium, the law firm’s optimal legal effort level and the human capital input are

$$ \tau_4^* = w \quad , \quad e^* = 0. \quad (4.26) $$
Both of them are constants and do not change with the difficulty of the case. Therefore in equilibrium the utility functions become:

\[ U^{LA} = \frac{1}{2}w^2 - C_L \]  
\[ U^{I4} = \alpha - C_I + \pi \frac{\theta}{1 + \theta} \nu_1 - \pi \frac{2\theta}{1 + \theta} w^2. \]  

(4.27)  
(4.28)

Many literatures argue that hourly fees can eliminate the (financial) conflict of interest between clients and lawyers effectively.\(^{22}\) One, previously unresearched, dimension along which conflict could arise relates to the difficulty of the case. As we saw in Figure 4.2, effort levels under hourly fees can be sensitive to case difficulty, and this might be thought as 'conflict'. As (4.26) shows, this issue is removed by the Type I firm since the lawyer no longer has a reputational interest in the firm and, so, does not let this influence her choice of hours.

### 4.3.2.2 Conditional fee

If the law firm charges a conditional fee, the only risk left to the insurer is the opponent's legal fee when the case is lost. Given the proportional fee mark-up \( \delta > 0 \), the law firm and the insurer's utility functions are specified as follows:

\[ U^{L5} = pf^w - \phi - C_L = \frac{\tau}{\tau + \theta \tau_D} (1 + \delta) w \tau - \frac{1}{2} \tau^2 - \frac{1}{2} e^2 - C_L \]  
\[ U^{I5} = \alpha - C_I + \pi \left( \nu_1 \frac{\tau}{\tau + \theta w} + \nu_2 e - \frac{\theta w}{\tau + \theta w} w^2 \right). \]  

(4.29)  
(4.30)

\(^{22}\)For example, Gravelle & Waterson (1993) point out that since under hourly fees the lawyer’s income is independent from the outcome of the case, she has no financial incentive to offer biased advice to the plaintiff. Dana & Spier (1993) and Emons (2000) claim that when the lawyer chooses her effort, hourly fees are efficient given that the plaintiff is ignorant.
Since the defendant's optimal legal effort is \( \tau_D^* = w \), the law firm's optimal legal effort is derived by maximizing \( U^{Lb} \) with respect to \( \tau \). The reaction function is given by:

\[
\frac{2\tau(1+\delta)w}{\tau+\theta w} - \frac{\tau^2(1+\delta)w}{(\tau+\theta w)^2} - \tau = 0. \tag{4.31}
\]

Making the natural assumption that \( \tau > 0 \), the only real number solution for the above cubic equation is:

\[
\tau^*_6 = \frac{w}{2} \left( 1 + \delta + \sqrt{1 + 4\theta + 2\delta + 4\theta\delta + \delta^2} \right) - \theta \theta. \tag{4.32}
\]

Similarly, we can solve the law firm's optimal human capital input from (4.29) which, as in (4.26), is \( \epsilon^* = 0 \).

Comparing this with the Type I firm's effort under the hourly fee \( \tau_r^* \), we find:

**Result 4.4:** For a Type I integrated law firm, under the conditional fee arrangement its legal effort will be greater than under the hourly fee arrangement if and only if \( \delta > \frac{\theta^2}{1+2\theta} \).

This result is similar to that in Result 4.2: i.e. once again, though we now see more explicitly the tradeoff between the difficulty of the case and the fee mark-up under conditional fees. The fee mark-up provides incentives to the law firm to invest in the case. Given a \( \theta \), increasing \( \delta \) is likely to increase the firm's marginal profit. However, the difficulty of the case represents the law firm's risk and this deters it from investing. When the fee mark-up \( \delta \) is given,
increasing in the difficulty of the case $\theta$ will increase the risk of the conditional fee contracted firm since the firm will receive no fee if the case is lost. It is reasonable that, under this situation, the firm will reduce its effort to resist the risk. However, for the hourly fee contracted firm, its income does not change with the difficulty of the case. Therefore, when $\theta$ increases to a certain level, the firm will provide more effort under the hourly fee than it under the conditional fee.

Figure 4.5 illustrates the effects of the fee mark-up $\delta$ and difficulty $\theta$ on the law firm’s effort decision. It is clear that the law firm’s legal effort is increasing
with the mark-up but decreasing with the difficulty.\textsuperscript{23} Since $\frac{\partial r}{\partial \delta} < 0$, we can see that removing the reputational incentive from the law firm removes the incentive to increase hours over some (low level) range of difficulty.

Furthermore, if the condition $\delta > \frac{\theta^2}{1 + 2\theta}$ holds, under the conditional fee the law firm has higher legal effort than under the hourly fee, which gives $\nu > w$. The law firm and the insurer's utility become:

$$U^{L5} = \frac{(1 + \delta)^2}{\nu + \theta w} - \frac{1}{2\nu} w^2 - C_L > \frac{1 + 2\delta - \theta}{2(1 + \theta)} w^2 - C_L$$

$$U^{L5} = \alpha - C_I + \pi \left( \frac{\tau^2}{\nu + \theta w} - \frac{\theta w}{\tau + \theta w} w^2 \right) > \alpha - C_I + \pi \frac{\theta - \theta}{1 + \theta} \nu - \pi \frac{\theta}{1 + \theta} w^2.$$

Comparing $U^{L5}$ and $U^{L5}$ with $U^{L4}$ and $U^{L4}$, we find that $U^{L5} > U^{L4}$ when $\delta > \frac{\theta^2}{1 + 2\theta}$ and $U^{L5} > U^{L4}$. We state:

\textbf{Result 4.5:} When $\delta > \frac{\theta^2}{1 + 2\theta}$, there exists a region where $U^{L5} > U^{L4}$ and $U^{L5} > U^{L4}$.

Result 4.5 implies that, in principle, for a given difficulty of case, the insurer and the law firm can choose a $\delta$ such that both will prefer a conditional fee contract to an hourly fee contract. Also, not surprisingly, in the circumstance that $\delta$ comparatively small (so that $\tau < \frac{1 - \theta}{2} w$—perhaps, though not necessarily, as a result of regulation) the insurer will only offer the hourly fee contract.

\textsuperscript{23}This can be proved theoretically by obtaining partial derivatives which are

$$\frac{\partial r}{\partial \delta} = \frac{1}{2} w \left[ 1 + \frac{1 + \delta + 2\theta}{\sqrt{1 + 2\theta + \delta^2 + 4\theta + 4\delta}} \right]; \quad \frac{\partial r}{\partial \theta} = \frac{1}{2} w \left[ -2 + \frac{2 + 2\delta}{\sqrt{1 + 2\theta + \delta^2 + 4\theta + 4\delta}} \right].$$

Since $\theta > 0$ and $\delta > 0$, $\frac{\partial r}{\partial \delta} > 0$ and $\frac{\partial r}{\partial \theta} < 0$. 

146
to the law firm.

4.3.2.3 “Eat what you kill”

Now the payment contract between the insurer and the firm becomes the “eat what you kill” scheme which means the insurer pays the firm a fixed fee $F$ plus an hourly fee if the case is won and only the fixed fee if the case is lost. Under this scheme, using the defendant’s equilibrium effort choice, the law firm’s utility function becomes:

$$U^{L6} = pf^{\omega} + F - \phi_1 - \phi_B - C_L = \frac{\tau}{\tau + \theta w} - \tau w + F - \frac{1}{2}\tau^2 - \frac{1}{2}\theta^2 - C_L. \quad (4.33)$$

Thus, the law firm’s optimal effort level is given by maximizing $U^{L6}$ with respect to $\tau$, which is

$$\tau^*_6 = \frac{w}{2}(1 + \sqrt{1 + 4\theta}) - \theta w. \quad (4.34)$$

As before, the fixed fee $F$ does not affect the law firm’s effort decision. Comparing this result with $\tau^*_6$, we find that when $\delta = 0$, $\tau^*_6 = \tau^*_6$, otherwise $\tau^*_6 > \tau^*_6$. In addition, given the difficulty $\theta > 0$, because $\sqrt{1 + 4\theta} < \sqrt{1 + 4\theta + 4\theta^2}$, $\sqrt{1 + 4\theta < 1 + 2\theta}$, we have $\tau^*_6 < w$.

Result 4.6: The Type I integrated law firm produces its lowest legal effort when it is paid under an “eat what you kill” arrangement.

From (4.29), we find that the firm’s human capital input still stays at its minimum $e^* = 0$. Substituting the equilibrium effort $\tau^*$ and $e^* = 0$ into the
law firm’s utility function $U^{L6}$, we have:

$$
U^{L6} = \frac{1 + 5\theta + 3\theta^2 + (1 + \theta - \theta^2)\sqrt{1 + 4\theta}}{2(1 + \sqrt{1 + 4\theta})} w^2 + F - C_L
$$

$$
= \frac{1 + \theta - \theta^2}{2} w^2 + \frac{2\theta (1 + \theta)}{1 + \sqrt{1 + 4\theta}} w^2 + F - C_L.
$$

Comparing this with $U^{L4}$ and $U^{L5}$, we find that if $\theta \leq 1$, ‘the “eat what you kill” arrangement brings higher utility to the Type I firm than hourly fees, even when the transfer is fixed at $F = 0$. However under other situations the law firm chooses an “eat what you kill” arrangement only when $F$ is large enough. The fixed payment $F$ actually dilutes its attitude towards the risk of losing the case.

We now consider the insurer’s choice of fee contract (i.e. Stage 1 of our game). Substituting the firm’s optimal choices into the insurer’s utility function gives:

$$
U^{I6} = \alpha - C_I + \pi \nu_1 \frac{\tau_6}{\tau_6 + \theta w} - \pi \left( \frac{\theta w}{\tau_6 + \theta w} w^2 + F \right)
$$

$$
= \alpha - C_I + \pi \nu_1 \frac{1 + \sqrt{1 + 4\theta} - 2\theta}{1 + \sqrt{1 + 4\theta}} - \pi \left( \frac{2\theta}{1 + \sqrt{1 + 4\theta}} w^2 + F \right).
$$

In Stage 1, the insurer chooses a fee arrangement to maximise its utility. Comparing $U^{I6}$ with $U^{I4}$ and $U^{I5}$, since $\frac{2\theta}{1 + \sqrt{1 + 4\theta}} < \frac{2\theta}{1 + \theta}$, there is a region where $U^{I6} > U^{I4}$ for a positive $F$. Also, $\frac{2\theta}{1 + \sqrt{1 + 4\theta}} > \frac{\theta}{1 + \theta}$ for any $\theta > 0$, therefore $U^{I6} < U^{I5}$. This implies that the insurer prefers the “eat what you kill” arrangement to the hourly fee arrangement, but its favorite is the conditional fee arrangement.
The legal effort comparison between the independent law firm and the Type I integrated firm reveals the effects of organisational structure and ownership changes. Figure 4.6 shows the comparison of both under conditional fees. Obviously, given the same \( S \) and \( 0 \), the Type I firm’s legal effort is below the independent firm’s effort. Since \( \tau_1 > \tau_4, \tau_2 > \tau_5, \tau_3 > \tau_6 \) and the independent firm’s human capital input is greater than the Type I integrated firm, we conclude:

**Result 4.7:** If the insurance company merges with an independent law firm and controls the ownership of the law firm’s assets, the law firm’s legal effort will decrease and its input to human capital will stay at its minimum \( (e = 0) \).
4.3.3 Type II integrated firm

Now we study the situation where the law firm merges the insurance company. The new firm is both the plaintiff’s financial supporter and legal service provider. We define the new firm’s running cost as \( C^H \). Given in equilibrium the defendant’s legal effort is a constant \( w \), Type II integrated firm’s utility function becomes:

\[
U^H = \alpha - C^H + \pi[p f^w - (1 - p) f^D + \nu_R + \nu_B - \phi_1 - \phi_B]
\]  

(4.37)

Note that since the firm provides legal expenses insurance services, if the case is lost, the firm cannot charge its legal fee from the plaintiff. The fee is covered by the insurance policy which is underwrote by the firm itself.

**Hourly fee**

Under the hourly fee, \( f^w = f^0 = w \tau \), it gives

\[
U^H = \alpha - C^H + \pi \left[ \frac{\tau}{\tau + \theta w} - \frac{\theta w}{\tau + \theta w} w^2 + \nu_1 \frac{\tau}{\tau + \theta w} - \frac{1}{2} \tau^2 + \nu_2 e - \frac{1}{2} \epsilon^2 \right]
\]

The firm’s optimal effort decision is derived by maximizing the above utility function with respect to the legal effort \( \tau \) and \( e \). The reaction functions are:

\[
\frac{2 \tau w}{\tau + \theta w} - \frac{\tau^2 w}{(\tau + \theta w)^2} + \frac{\theta w}{(\tau + \theta w)^2} (w^2 + \nu_1) - \tau = 0
\]

\[
\nu_2 - e = 0
\]

“Eat what you kill”
Under this scheme, \( f^w = \omega r \) and \( f^0 = F \), the firm's utility function becomes

\[
U^{II} = \alpha - C^{II} + \pi \left[ \frac{\tau}{\tau + \theta w} \omega r - \frac{\theta w}{\tau + \theta w} \omega^2 + \nu_1 \frac{\tau}{\tau + \theta w} - \frac{1}{2} \tau^2 + \nu_2 e - \frac{1}{2} e^2 \right]
\]

Solving the above utility function with respect to the legal effort \( \tau \) and \( e \), the reaction functions are:

\[
\frac{2\tau \omega}{\tau + \theta w} - \frac{\tau^2 \omega}{(\tau + \theta w)^2} + \frac{\theta \omega}{(\tau + \theta w)^2} (\omega^2 + \nu_1) - \tau = 0
\]

\[
\nu_2 - e = 0
\]

Comparing the above reaction functions, we can find that if the Type II firm charges "eat what you kill", the firm has exactly the same effort as when it charges hourly fees.

**Conditional fee**

Under the conditional fee, \( f^w = (1 + \delta) \omega r \), (4.37) becomes

\[
U^{II} = \alpha - C^{II} + \pi \left[ \frac{\tau}{\tau + \theta w} (1 + \delta) \omega r - \frac{\theta w}{\tau + \theta w} \omega^2 + \nu_1 \frac{\tau}{\tau + \theta w} - \frac{1}{2} \tau^2 + \nu_2 e - \frac{1}{2} e^2 \right]
\]

The firm's optimal effort decision is derived by maximizing above utility function with respect to the legal effort \( \tau \) and \( e \). The reaction functions are:

\[
\frac{2\tau (1 + \delta) \omega}{\tau + \theta w} - \frac{\tau^2 (1 + \delta) \omega}{(\tau + \theta w)^2} + \frac{\theta \omega}{(\tau + \theta w)^2} (\omega^2 + \nu_1) - \tau = 0
\]

\[
\nu_2 - e = 0
\]

Comparing the reactions functions of the conditional fee with the hourly fee.
We find that (4.38) and (4.39) can be seen as the general solutions of the Type II firm. When the proportional fee mark-up $\delta = 0$, (4.38) is the reaction function of the hourly fee and the "Eat what you kill" scheme. Figure 4.7 illustrates the effects of the proportional fee mark-up $\delta$ and the difficulty of
the case $\theta$ on Type II integrated firm's legal effort level.\(^{24}\) The comparative statics with respect to $\tau$ proves that the legal effort $\tau$ is increasing with the the proportional fee mark-up $\delta$.\(^{25}\) If the firm charges hourly fees, which means the proportional fee mark-up $\delta = 0$, the legal effort $\tau$ is the lowest in its set given a difficulty $\theta$. In addition, the Type II firm's input into human capital is at the same level as the independent firm.

Now we compare the Type II integrated firm's effort with the Type I and the independent law firm in two scenarios. In scenario 1, the Type II integrated firm is restricted to a hourly fee arrangement. So, for the Type II firm, $\delta = 0$. Figure 4.8 illustrates the Type II firm's hourly fee effort. Comparing its effort with the hourly fee independent law firm, we find that when $\theta < 1$ the Type II law firm has higher legal effort, when $\theta > 1$ the independent firm has higher legal higher effort, and when $\theta = 1$ they has the same legal effort.\(^{26}\) When

\[^{24}\text{Since the assumption requests } \tau > 0, \text{ so the only solution of this cubic function is:}\]

\[\tau^*_I = (1/6)[48w^3\theta \delta + 132w^3\theta - 84w^3\theta^2 + 24w^3\theta^2 - 84w^3\delta \theta + 89w^3 \delta^3 + 108w^3 \delta + 8w^3 \delta^3 + 24w^3 \delta^2] + 12(-234w^6 \theta \delta - 36w^6 \theta^2 \delta^2 + 81w^6 \theta^2 \delta + 72w^6 \theta \delta^2 + 36w^6 \theta \delta^2 + 36w^6 \delta^2 + 36w^6 \delta^3 + 12w^6 \delta^3 + 36w^6 \delta^2 + 36w^6 \delta - 108w^6 \delta^3 + 80w^6 \delta^4 - 48w^6 \delta^5 + 12w^6 \delta^5 + 12w^6 \delta^5 + 36w^6 \delta^2 + 36w^6 \delta - 36w^6 \delta^3 + 45w^6 \delta^4 - 12w^6 \delta^4 - 12w^6 \delta^6)]^{1/3}
\]

\[^{25}\text{Since } \frac{\partial^2 \tau}{\partial \theta^2} = (\tau + 2 \theta w)\tau w > 0 \text{ and by the second-order necessary condition } \frac{\partial^2 \tau}{\partial \theta^2} < 0, \]

\[^{26}\text{When } \theta = 1, \tau_1 = \tau^*_I = 1.205w.\]
compared with the Type I firm, only when the difficulty of the case is very high $\theta > 2$, the Type I firm has higher effort.\footnote{When $\theta = 2$, $\tau_4 = \tau_{II} = w$.} To sum up, under the hourly fee, for these three organisational structures, if $\theta < 1$, the Type II firm has higher effort, if $\theta > 1$ the independent firm has higher effort, and if $\theta = 1$ the Type II firm and the independent firm have the same legal effort.

In scenario 2, we assume the Type II integrated firm can charge a conditional fee and the proportional fee mark-up $\delta$ is set as the same as in the independent law firm. Under this situation the integrated firm’s legal effort is always greater then the independent law firm’s. Figure 4.9 shows the comparison. Since we
have already shown that the independent firm has higher legal effort than the Type I firm, given an exogenous $\delta$, under conditional fees the Type II integrated firm has higher legal effort level than the other law firms.

### 4.4 Welfare implications

In the previous sections, we examined how organisational structure and ownership changes affect the incentives of the law firm to act in the best interests of litigants. In this section, we focus on welfare effects of these changes.
4.4.1 Defendant’s welfare

As Result 4.1 claims, the organisational structures and ownerships of the law firm will affect the defendant through the plaintiff’s legal effort level. Since the defendant’s legal effort can be regarded as a constant, as Equation (4.13) shows, his post-accident welfare is decreasing in the plaintiff’s legal effort. The ex post welfare under different organisational structures are expressed as follows:

**Independent firm hourly fee** \( V_1 = y_D - \frac{y}{\tau_1 + \theta w}(A + 2w^2 + w\tau_1) \)

**Independent firm conditional fee** \( V_2 = y_D - \frac{y}{\tau_2 + \theta w}(A + 2w^2 + (1 + \delta)w\tau_2) \)

**Independent firm “eat what you kill”** \( V_3 = y_D - \frac{y}{\tau_3 + \theta w}(A + 2w^2 + w\tau_3) \)

**Type I firm hourly fee** \( V_4 = y_D - \frac{y}{\tau_4 + \theta w}(A + 2w^2 + w\tau_4) \)

**Type I firm conditional fee** \( V_5 = y_D - \frac{y}{\tau_5 + \theta w}(A + 2w^2 + (1 + \delta)w\tau_5) \)

**Type I firm “eat what you kill”** \( V_6 = y_D - \frac{y}{\tau_6 + \theta w}(A + 2w^2 + w\tau_6) \)

**Type II firm** \( V_{II} = y_D - \frac{y}{\tau_{II} + \theta w}(A + 2w^2 + w\tau_{II}) \)

Using the results of the last section, we can conclude that: (1) \( V_6 > V_3 > V_{II} \), \( V_5 > V_2 > V_{II} \); (2) If \( \delta > \frac{\theta^2}{1 + \theta^2} \), \( V_4 > V_6 \); and (3) \( V_{II} > V_4 > V_1 \) if \( \theta > 2 \), \( V_4 > V_{II} > V_1 \) if \( 2 > \theta > 1 \), \( V_4 > V_1 > V_{II} \) if \( \theta < 1 \), and \( V_1 = V_{II} \) if \( \theta = 1 \).

These results are briefly summarised in the follow table:
In addition, from the above *ex post* welfares, we have $\frac{\partial V}{\partial \tau} < 0$, where $\tau$ is the plaintiff's legal effort. Hence, when the plaintiff's legal effort increases, the defendant's *ex post* welfare decreases. In the case that the defendant can affect the probability of the accident, adopting the endogenous accident probability setting of Gravelle & Waterson (1993), the defendant's pre-accident or *ex ante* welfare becomes

$$H = [1 - \pi(x)](y_D - x) + \pi(x)(V - x) = [1 - \pi(x)]y_D + \pi(x)V - x \quad (4.40)$$

where $x$ is the defendant's expenditure on care to avoid the accident, $\pi$ is the accident probability which is a decreasing function of $x$ (also $\pi' < 0$ and $\pi'' > 0$). The defendant chooses $x$ to maximise his *ex ante* welfare $H$, and the first order condition is: $-1 + \pi'(x)(V - y_D) = 0$. It is clear that $x$ is decreasing in $V$. Therefore, the volume of accidents is increasing in $V$. Since $V$ is decreasing in $\tau$, the volume of accidents is decreasing in the plaintiff's legal effort. Moreover, $V - y_D$ is the defendant's cost of litigation, so the increase in the input of care can tradeoff the risk increase caused by the extra legal effort of the plaintiff. However, the effect of the plaintiff's legal effort on the defendant's *ex ante* welfare is still not clear. This is because the sensitivity

<table>
<thead>
<tr>
<th>Conditional fee</th>
<th>Type I &gt; Independent &gt; Type II</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Eat what you kill&quot;</td>
<td>Type I &gt; Independent &gt; Type II</td>
</tr>
<tr>
<td>Hourly fee: $\theta &lt; 1$</td>
<td>Type I &gt; Independent &gt; Type II</td>
</tr>
<tr>
<td>Hourly fee: $\theta = 1$</td>
<td>Type I &gt; Independent = Type II</td>
</tr>
<tr>
<td>Hourly fee: $2 &gt; \theta &gt; 1$</td>
<td>Type I &gt; Type II &gt; Independent</td>
</tr>
<tr>
<td>Hourly fee: $\theta &gt; 2$</td>
<td>Type II &gt; Type I &gt; Independent</td>
</tr>
</tbody>
</table>
of \( \pi \) to a change in \( x \) plays an important role in calculating \( H \). For example, when \( \pi \) is very elastic, if the plaintiff’s legal effort increases, the defendant’s welfare may increase. Only when \( \pi(x) \) is clearly defined, can a firm conclusion on the defendant’s ex ante welfare be given. In an extreme setting, when \( \pi \) is a constant (i.e. an exogenous probability of accident), the defendant’s ex ante welfare is decreasing in the plaintiff’s legal effort. We state:

**Result 4.8:** Changes in the organisational structure and ownership of the law firm make the volume of accidents reduce if they increase the plaintiff’s legal effort.

An obvious application of the above statement is that accidents will increase if the conditional fee contracted law firm is organized as the Type I firm rather than independent or Type II.

### 4.4.2 Plaintiff’s welfare

The effects of the organisational structure and ownership on the plaintiff’s welfare, especially ex ante welfare, are more difficult to determine because they directly change his net expected income as well as decision of the defendant which affect the plaintiff’s welfare. The general form of the plaintiff’s expected ex post welfare has been given by Equation (4.11). We use \( U_1^P \) to denote the plaintiff’s ex post welfare under the situation that his law firm is independent and charging hourly fee; \( U_2^P \) to denote the independent firm with conditional fee; \( U_3^P \) to denote the independent firm with “eat what you kill”; \( U_4^P \) to denote the Type I integrated firm with hourly fee; \( U_5^P \) to denote the Type I integrated
firm with conditional fee; $U^P_0$ to denote the Type I integrated firm with “eat what you kill”; and $U^P_H$ to denote the Type II integrated firm. Some results can be obtained from (4.11) and the effort comparisons: (1) $U^P_H > U^P_I > U^P_0$, $U^P_I > U^P_H > U^P_F$; (2) If $\delta > \frac{\theta^2}{1+2\theta}$, $U^P_F > U^P_H$; and (3) $U^P_I > U^P_H > U^P_H$ if $\theta > 2$, $U^P_I > U^P_H > U^P_F$ if $2 > \theta > 1$, $U^P_H > U^P_I > U^P_F$ if $\theta < 1$, and $U^P_I = U^P_H$ if $\theta = 1$.

We summarise:

<table>
<thead>
<tr>
<th>TABLE 4-3: Plaintiff’s ex post welfare</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditional fee</td>
</tr>
<tr>
<td>“Eat what you kill”</td>
</tr>
<tr>
<td>Hourly fee: $\theta &lt; 1$</td>
</tr>
<tr>
<td>Hourly fee: $\theta = 1$</td>
</tr>
<tr>
<td>Hourly fee: $2 &gt; \theta &gt; 1$</td>
</tr>
<tr>
<td>Hourly fee: $\theta &gt; 2$</td>
</tr>
</tbody>
</table>

In the above table, in most of the situations, the Type I firm produces the lowest ex post welfare for the plaintiff. The reason for this is that the property right on the reputational asset gives an incentive to firms. Since the Type I firm does not have any return from its assets, it will only choose a “breakeven” effort where the legal fee income equals the effort disutility. While for the Type II firm and the independent firm, since winning can increase the firm’s reputational asset, there is an incentive to supply more effort. While under the hourly fee, since the Type II firm has no income if the case is lost, when dealing with a very difficult case ($\theta > 2$), the incentive from the reputational asset has been offset. This is the reason why under this situation, the Type I firm has higher effort than the Type II firm.
The plaintiff’s \textit{ex ante} welfare is

\[ Y^P = y_p - \alpha + \pi(-L + pA) = y_p - \alpha + \pi U^P \]

(4.41)

For an exogenous insurance premium $\alpha$, the comparisons of any two \textit{ex ante} welfare do not yield any firm conclusion. This is because although the comparisons of \textit{ex post} welfare are clear, there is not enough information about the accident probability $\pi$. As discussed in the last subsection, $\pi$ is decreasing in the plaintiff’s legal effort. For example, for two hypothetical \textit{ex post} welfares $U^p_a$ and $U^p_b$, if $U^p_a > U^p_b$, it must be that $\pi_a < \pi_b$. It will be difficult to evaluate $\pi_a U^p_a$ and $\pi_b U^p_b$ without specified $\pi$. Once again, only when $\pi$ is exogenous, does the plaintiff’s \textit{ex ante} welfare change in the same direction as his \textit{ex post} welfare.

If $\alpha$ is endogenous the situation is more complicated. One way to satisfy the endogenous $\alpha$ assumption is to assume the insurance market is competitive. We start from the independent law firm. If the insurance premium is actuarially fair it becomes $\alpha = C_I + \pi \frac{\theta w}{\tau + \theta w} (w^2 + f^0)$. For the hourly fee $f^0 = \tau w$, therefore the plaintiff’s \textit{ex ante} welfare is:

\[ Y^P_1 = y_p - C_I + \pi \left[ -L + \frac{\tau_1}{\tau_1 + \theta w} A - \frac{\theta w}{\tau_1 + \theta w} (w^2 + \tau_1) \right]. \]

For the conditional fee $f^0 = 0$, then the plaintiff’s \textit{ex ante} welfare is:

\[ Y^P_2 = y_p - C_I + \pi \left[ -L + \frac{\tau_2}{\tau_2 + \theta w} A - \frac{\theta w}{\tau_2 + \theta w} w^2 \right]. \]

Even for an exogenous $\pi$, it is difficult to compare $Y^P_1$ with $Y^P_2$ if $\tau_1 > \tau_2$. How-
ever, in the region that $\tau_1 \leq \tau_2$, if $\pi$ is exogenous, we can confirm $Y_1^p < Y_2^p$.

For the “eat what you kill” scheme $f^0 = F$, the plaintiff’s ex ante welfare is

$$Y_3^p = y_p - C_I + \pi \left[ -L + \frac{\tau_3}{\tau_3 + \theta w} A - \frac{\theta w}{\tau_3 + \theta w} (w^2 + F) \right].$$

Since $\tau_3 < \tau_2$, if $\pi$ is exogenous, $Y_3^p < Y_2^p$.

The insurance premium under the situation of the Type I integrated law firm is

$$\alpha = C_I - \pi \left[ \nu_1 \frac{\tau}{\tau + \theta w} - \frac{\theta w}{\tau + \theta w} (w^2 + f) \right].$$

For the hourly fee $f^0 = \tau w$, therefore the plaintiff’s ex ante welfare is:

$$Y_4^p = y_p - C_I + \pi \left[ -L + \frac{\tau_4}{\tau_4 + \theta w} A + \nu_1 \frac{\tau_4}{\tau_4 + \theta w} - \frac{\theta w}{\tau_4 + \theta w} (w^2 + \tau_4 w) \right].$$

Substituting $f^0 = 0$ for the conditional fee and $f^0 = F$ for the “eat what you kill” scheme, the plaintiff’s ex ante welfare under these two arrangements are respectively:

$$Y_5^p = y_p - C_I + \pi \left[ -L + \frac{\tau_5}{\tau_5 + \theta w} A + \nu_1 \frac{\tau_5}{\tau_5 + \theta w} - \frac{\theta w}{\tau_5 + \theta w} w^2 \right].$$

$$Y_6^p = y_p - C_I + \pi \left[ -L + \frac{\tau_6}{\tau_6 + \theta w} A + \nu_1 \frac{\tau_6}{\tau_6 + \theta w} - \frac{\theta w}{\tau_6 + \theta w} (w^2 + F) \right].$$

If $\pi$ is exogenous, since $\tau_5 > \tau_6$, we can conclude $Y_5^p > Y_6^p$.

The case of the Type II integrated firm is more complicated. In equilibrium the insurance premium becomes

$$\alpha = C^{II} - \pi \left[ \frac{\tau}{\tau + \theta w} (1 + \delta) \tau w - \frac{\theta w}{\tau + \theta w} w^2 + \nu_1 \frac{\tau}{\tau + \theta w} - \frac{1}{2} \tau^2 \right].$$
The plaintiff’s *ex ante* welfare is

\[ Y_{HI}^P = y_P - C^{HI} + \pi \left\{ -L + \frac{\tau_{HI}}{\tau_{II} + \theta w} [(1 + \delta)\tau_{II}w + A] - \frac{\theta w^3}{\tau_{II} + \theta w} + \frac{\nu_1 \tau_{II}}{\tau_{II} + \theta w} - \frac{1}{2} \pi \right\}. \]

Now, comparisons amongst above welfare \((Y_{HI}^P)\) to \((Y_{II}^P)\) can not generally produce a firm conclusion. First, as we discussed above, the accident probability needs to be well defined. Second, the size of the accident loss \(L\) and the compensation \(A\), and their relations \((L > A \text{ or } L = A \text{ or } L < A)\), play important roles in the *ex ante* welfare. Third, specified costs \(C_I\) and \(C^{II}\) affect the plaintiff’s welfare. For example, if \(C^{II}\) can be reduced to the same level as \(C_I\), \(Y_{II}^P\) is more likely to exceed \(Y_2^P\) and \(Y_4^P\), given a very inelastic \(\pi\). Finally, for the “eat what you kill” scheme, as \(Y_3^P\) and \(Y_6^P\) show, the fixed payment \(F\) is actually imputed to the plaintiff. In this case, a suitable setting on \(F\) will increase the plaintiff’s *ex ante* welfare.

### 4.5 Summary and conclusions

In this chapter we studied the effects of a law firm’s organisational structure and ownership changes on its legal effort provision. We were particularly interested in organisational integrations between legal expenses insurers and law firms. Therefore, we chose two types of integration and compared them to the current organisational structure (the independent law firm). The results suggest that an alternative organisational structure which allows law firms to provide legal expenses insurance services will motivate higher legal effort from lawyers than other structures. Although there are some ambiguities in the welfare analysis, our conclusions clearly suggest that under the integrated
structure (Type II) higher legal effort and welfare status can both be achieved by an appropriate setting of the conditional fee mark-up.

Our work also suggests some directions for research. This chapter mainly studied the effort incentive within integration. Indeed, for integrated firms, our research findings are based on the situation where the ownership is controlled by lawyers. If lawyers lose their ownerships in a new firm, their willingness to provide effort will accordingly be reduced. This implies that partners and legal employees have different levels of effort. Therefore, studying managerial structures within the integrated firm would be worthwhile.

Moreover, in our model, we assume the defendant’s lawyer can only charge hourly fees. Our conclusions are all based on this assumption. If this assumption is relaxed, some of the results may change. For example, if the defendant’s lawyer charges conditional fees, her decision on effort provision will change accordingly. In this case, the difficulty of the case may become the most important factor in the litigation subgame. This can be an interesting topic for future research because it may give some insights on why lawyers drop cases.

We have concentrated on the role of law firm’s organisational structure in providing effort incentives. As we described at the beginning of the chapter, changes brought by new business structures in reality will far exceed the complexity of this. For example, under the new organisational structure (Type I or Type II), if the integrated firm goes public, which is currently suggested by some big law firms in the UK, the transaction decisions of stockholders may
significantly affect the law firm’s legal effort. Our model must be extended if these arrangements are to be studied carefully. Nevertheless, our framework may provide a foundation from which advances can be made.

It is clear that, when introducing an alternative organisational structure, and conducting a full welfare analysis, ambiguous results are almost certain to appear here. A clear lesson from this chapter is that alternative organisational structures will have subtle effects and these should be studied carefully when evaluating policy in this area.
Chapter 5

Conclusions
This chapter has two objectives: first, to summarise the results derived in Chapters 3-4 and their relation to our research questions as set out in Chapter 1; second, to indicate the limitations of our models and to suggest further studies which can be based on our frameworks. Section 6.1 and 6.2 address these objectives respectively.

5.1 Discussion of results

Before we summarise our results and relate them to our research questions, it is useful to review the analytical structure from which they are derived. This enables us to distinguish our work from existing literature.

5.1.1 Analytical structure

In Chapter 1, we highlighted the current legal reform in England and Wales and the three-way relationship in the market of legal services and proposed our research questions. The literature review in Chapter 2 had shown that these research questions have not been answered yet.

Chapter 3 focuses on litigants' trial/settlement decisions. In the model, we considered both the plaintiff’s side’s and the defendant’s side’s decisions. The purpose of the model was to examine the combined effects of legal expenses insurance and conditional fees on settlement. The model in Chapter 4 focused on the lawyer’s effort provision. Similar to the model of Chapter 3, this model considered both sides of the litigation. However, the model analysed the legal effort provision from the perspective of industrial organisation.
So, organisational structures, human capital and reputation incentives were accommodated. In terms of the three-way relationship set out in Chapter 1 (Figure 1.2), Chapter 3 considers the contract between the insurer and the plaintiff, while the models in Chapter 4 focus on the contract between the insurer and the lawyer. Thus, to a large extent, the thesis considers all elements of the three-way relationship.

This study differs from other contributions in this area for two reasons. First, it recognises the complementarity between fee reform and structural developments. Several authors have examined conditional fees (Emons (2007); Emons & Garoupa (2006)) and legal expenses insurance (van Velthoven & van Wijck (2001); Heyes et al. (2004); Kirstein & Rickman (2004)). Others (in addition to Fenn et al. (2006); Abrams (2002)) have recently begun to examine the market structure implications of Clementi’s proposals (Grout (2005); Grout, Jewitt & Sonderegger (2007)). These have not been combined together before. Second, it considers the effects of these arrangements on lawyer effort. None of the above papers look at this while others who look at lawyer effort do not do so in the context of the fee and structural reforms described earlier (see Schwartz & Mitchell (1970); Halpern & Turnbull (1983); Rubinfeld & Scotchmer (1993)).

5.1.2 Answers to the research questions

In this subsection, we summarise our results in relation to the research questions of Chapter 1.
**Research Question 1:** What are the combined effects of legal expenses insurance and legal fee arrangements on litigation?

In Chapter 3, we looked into the combined effects of legal expenses insurance and fee arrangements on settlement. The combined effects on settlement are ambiguous. Compared to BTE hourly fees, ATE conditional fees reduce the plaintiff’s initial probability of accepting an offer but consequently increase the defendant’s settlement offer. Information on the distribution of accident loss plays an important role. For example, in the case of the uniform distribution, “an optimistic plaintiff”\(^1\) is more likely to settle under ATE conditional fees than BTE hourly fees. In a dynamic setting, ATE conditional fees lead to a faster settlement.

Chapter 4 looked at the combined effects of legal expenses insurance and legal fees in a different way – i.e. it made the comparison between insured conditional fees and insured hourly fees and focused on the lawyer’s legal effort provision. Now, the difficulty of the case and the success fee affect the result significantly. Indeed, comparison between conditional fees and hourly fees is actually a trade-off between the difficulty and the success fee. Given a difficulty level, we find that only when the success fee is high enough, do conditional fees motivate more effort. If the lawsuit is highly risky, hourly fees bring more legal effort than conditional fees.

**Research Question 2:** What are the effects of a law firm’s organisational

\(^{1}\)This follows the definition of Gravelle & Waterson (1993). For them, an optimistic plaintiff is defined as one for whom \( p > c_0/c_p \). Here the right hand side compares the cost of “stopping” \( (c_0) \) with that of continuing a trial \( (c_\text{p}) \).
This question was addressed in Chapter 4. We first looked into the relationship between litigants' welfare and the lawyer's legal effort. We found that if the law firm's organisational structure affects the lawyer's legal effort, litigants' welfare will change. This result actually implies that in legal reform the customers' best interests can be achieved by suitable choice of organisational structure. For comparison with the current organisational structure of the English legal market, we examined two possible types of integration, inspired by the Clementi Review (2004) in England and Wales. Both of them allow outside financial capital to enter the legal services market. The difference between them is whether lawyers still own the firm's assets. Of course, legal fee arrangements also play an important role in legal effort provision. As one main result, in a model where only the plaintiff is insured and the defendant's lawyer charges hourly fees, we found that, under conditional fees, the structure which also allows law firms to provide legal expenses insurance services (i.e. Type II in Chapter 4) will bring higher legal effort from lawyers than other structures including the independent law firm model that currently prevails in many jurisdictions. Although there were some ambiguities in welfare analysis, our conclusions clearly suggest that under the combined legal expenses insurance structure higher legal effort and welfare levels can be achieved by appropriately setting the conditional fee mark-up. For an inappropriately set fee mark-up, more difficult cases mean that hourly fees are preferred by the insured client. Our finding also confirms that property rights are one of the key incentives for effort provision. This implies that a legal employee provides less effort than a partner lawyer and an independent law firm works harder
than an insurer’s in-house lawyer. Also, if outside capital takes the lawyer’s control of the firm’s assets, the client’s interest is in danger. This is because the lawyer’s long term return from his assets is appropriated by the outside capital.

**Research Question 3: What is the optimal legal expenses insurance system?**

The answer of this normative question is based on analysis and results of Chapter 3 and 4. The optimal legal expenses insurance system can be justified by at least three perspectives. First, the optimal insurance system should minimise total litigation costs. This means the system will encourage settlement and reduce trial since the latter is more costly. When there are only two systems, BTE plus hourly fees and ATE plus conditional fees, to choose, if the distribution of the accident loss is uniform, ATE plus conditional fees is the optimal system. Second, the optimal insurance system should give incentives to lawyers to provide more effort since by this way clients’ profits may increase. However, in this sense the optimal system depends on the lawsuit itself. If the conditional fee mark-up is regulated, for a comparatively easy case, insurance plus conditional fees can be the optimal system, but for a comparatively difficult case, insurance plus hourly fees may be the optimal one. Third, the optimal insurance system requires an organisational structure in which lawyers have incentives to act in the best interests of clients. In this sense, the system that law firms can provide insurance and also offer conditional fees is the optimal system. In addition, from the perspective taken from the three-way relationship, an optimal legal expenses system should be a combination of an optimal insurance contract and an optimal provider payment contract, i.e. the fees charged by the provider. The designing of an optimal insurance system

170
is complicated. However, the relatively recent introduction of conditional fees may have enhanced the prospects of insurers designing optimal arrangements.

5.2 Further research

Our work suggests several directions for research. Naturally, if data are accessible (through survey or interviews) an empirical analysis based on our theoretical models (especially in Chapter 3) can be conducted. In what follows, we restrict attention to further research on the model themselves. A number of assumptions of our models could be relaxed or adapted in order to address other relevant questions. Here we list some of them.

Conflicts of interest between the lawyer and the client are an important issue in these principal-agent problems. In the general model of Chapter 3, we do examine the interactions between a plaintiff and his lawyer. However, when we look at specific fee arrangements, we assume the lawyer is altruistic in order to make analysis tractable. Therefore, we do not look into the role played by the lawyer’s self-interest in determining the effects fees and insurance on settlement behaviour. Some aspects of this question have been studied in early literature. Both Gravelle & Waterson (1993) and Rickman (1999) examine self-interested lawyers under specific fee arrangements (contingent fees, hourly fees and conditional fees). To pursue this question, our model of specific fees can be easily extended by adapting the weight variable (which reflects the lawyer’s influence on the plaintiff’s decision) of our general model in Chapter 3.

A related issue is the effects of fee arrangements and insurance on the plaintiff’s
decision to file a case. The role of lawyer self-interest could be central to this because output-based payments may encourage “cherry picking” by the agent. This would have important implications for the welfare comparison between hourly fees (BTE) and conditional fees (ATE).

In Chapter 4, it would be worthwhile to distinguish clients’ risk types as suggested by Heyes et al. (2004) and also it would be interesting to extend this chapter to cover pre-trial behaviour, where most litigation activity taken place. In the chapter, we assume that all lawyers in a law firm are equal partners. In practice, this is not the case. In large firms in many jurisdictions, we can observe several levels of partnership. For example, in England and Wales, there are typically three categories of partnership: equity, bonus and salary. Lawyers at different levels control different resources and assets. They may consequently choose different strategies to pursue their best interests. Therefore, introducing hierarchies into our model may make results richer. This could be achieved by combining the recent hierarchy model of Garicano & Hubbard (2007) with our model. Also, in the chapter, we did not consider the interactions between human capital and the result of litigation (winning probability). Our settings actually rule out the possibility of “learning by doing”. If this question is pursued, a refinement to our contest success function may be required (i.e. counting human capital as one term of the function). Moreover, the chapter mainly studied the effort incentive of integration. If lawyers lose their ownership in new firms, their willingness to provide effort will accordingly be reduced. Therefore, study of managerial structures of integrated firms within an incentive framework would be worthwhile.
Finally, there are potential linkages to be made between the chapters. For example, optimal insurance may be affected by institutional features (such as integration). Indeed, having characterised our chapters as each focusing on two elements of the three-way relationship in Figure 1.2, it would be rational to try to combine these together. Another aspect of both chapters that could be developed relates to the assumption that the lawyer cannot refuse a potential client’s case. This seems unrealistic and optimal insurance arrangements should provide incentives for screening out weaker cases – something not present in those we study. Also, the assumption of zero profit can be relaxed according to asymmetric information in the market.

As we described in Chapter 1, changes brought by recent and proposed legal reforms far exceed the complexity of those we have studied in this thesis. For example, under a new organisational structure, if the integrated firm goes public, which is suggested by some big law firms in the UK, the transaction decisions of stockholders may significantly affect the firm’s effort provision. Our model must be extended if these arrangements are to be studied carefully. Nevertheless, the frameworks presented in this thesis provide a foundation from which advances can be made.
Bibliography


175


178


