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GAME THEORETIC MODELING OF LITIGATION IN ENGINEERING PROJECTS

by

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Abstract

This dissertation reviews the historical background to civil litigation modeling from an economic perspective. After developing a description of the full civil litigation process as it presently exists in South Africa a complete game theoretic model is presented. Various aspects of this model are then discussed. It is clear from the preliminary model that there exists a strong theoretical support for the concept that the civil litigation process favors players who understand the underlying game theoretic elements and discriminates against individuals without the ability to analyse the model.

Keywords— legal game theory, litigation model, civil litigation.
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1. Introduction

No engineering project takes place in a vacuum; all such projects, irrespective of whether they are once-off or continuous projects are exposed, in addition to the obvious engineering design, implementation and commissioning risks, to the economic climate, legal rules surrounding the contract, human interactions and even weather changes causing delays. All engineering projects specifically take place within a legal setting and the structure of the legal environment can have a considerable effect on how disputes within and about a project are resolved. Therefore, it is necessary to consider the implications of various decisions made within a project, the legal consequences of those decisions as well as the consequences of other routes that could have been taken to avoid litigation.

In order to look at the efficiency of dispute resolution, the overall efficiency of the legal climate surrounding the dispute must be considered. In order to consider the efficiency of the system, the efficiency of the laws must be considered. This question is divided into ‘micro’ efficiency, which is an examination of particular doctrines. This method falls short as it only addresses the positive aspect of the analysis, but once a rule is found to be inefficient, then what? To address the normative element, ‘macro’ efficiency is defined as the overall efficiency of a legal system. However, no legal system is stagnant; the law is constantly changing through legislation or new judgements that create legal precedent.

The two primary sources of law are the common law, or the unwritten law, which has been developed through case law. In South Africa specifically judges have a constitutional obligation to develop the common law in the interest of justice, equality and fairness. The second source is legislation passed by the State. However this does not entitle the State to absolute power, legislation is bound by the provisions of the Constitution and if found to be unconstitutional it is amended or struck out. These sources function differently, the common law and precedent grow and adapt dependant on the case before the court, judgements in the court bind only those who are party to the case whereas legislation binds the entire country.

Initial analysis of the efficiency of law found that the common law was the most efficient source of law as it was established from the ground up according to the demand of the litigants (Parisi, 2005). When courts were established, the state did not control the court system through the rule of law. Prospective plaintiffs would approach a certain court based on what they could offer in terms of a just and fair judgement. Due to the competition between the courts in the formative period of the common law, the legal system tended towards efficiency and these efficient judgements formed precedents. Theoretically, by applying the theory of supply and demand to this system, efficiency can be established. The common law demonstrates ‘supply side efficiency’ (Parisi, 2005). Once in court, there was no bias between the parties and each would enter into litigation willingly and on an equal footing. In modern day South Africa, where there is no competition between the courts, parties are occasionally unwilling to litigate despite the fact that after discovery is done, they may have a *prima facie* stronger case.
The court system today abides by the doctrine of *stare decisis*, but in order to have your dispute heard before an impartial judge; litigants have to go through the civil court procedure which is governed by the rules of court and legislation. There would be no need for common law disputes, such as disputes around the breach or interpretation of a contract, if the contractual performance were due at the moment the contract is signed, however due to the nature of contracts, which involves this performance vesting over time, there is an element of uncertainty (Posner, 2004). Specifically in engineering contracts where the contract will run for a long period of time, and often, there will be different contractual teams. Often times if one of the teams suffers a delay, it will affect all of the other teams involved in the project causing the delay to increase substantially. There will also be inevitable changes in engineering contracts with regards to design and construction. These changes can either fast track, or more likely, delay the project. The common law principle of freedom of contract allows parties the freedom to elect a remedy within the boundaries of the criminal law and morality if a breach were to occur, however, without perfect foresight, parties cannot account for every eventuality. If parties elect that their relationship be governed by freedom of contract and the efficient common law, the question can be raised whether it is economically viable for them to endure a long, costly court process which could end in the parties being left worse off than before the contract was entered into? To ensure a remedy in every situation, perfect foresight is needed which increases the cost to contract affecting the costs of performance. Thus, is it reasonable to determine what the economics of the trial procedure are. In this dissertation an attempt will be made to determine the legal and economic efficiency of litigation of an engineering dispute in South Africa by applying various economic techniques to determine the overall cost of civil litigation.

Inefficiency in law results in major costs to all parties involved, this is because as the stakes increase, the probability of litigation over settlement increases (Fon *et al.* 2002). Rational parties would normally be willing to settle when the forecasted costs of trial outweigh the amount the party is trying to claim by using litigation. Another factor in determining whether factitious litigation may ensue, regards the specific nature of a party to the dispute. If a party is willing to litigate, no matter the projected cost of the ensuing litigation, this will put an additional burden on the courts and will, in all likelihood, lead to the squandering of precious resources. Judgements create law through the doctrine of *stare decisis* and if the decisions of a court are inefficient or unnecessary, they will consequently be carried through the legal system until the law is finally appealed against and amended. It is not possible to address all sources of inefficiency in law; however, by providing an efficient judicial body, resources will be used more efficiently and this will ensure that remedies are awarded to deserving parties.

In engineering disputes, there are additional factors to consider when deciding how to resolve a dispute. Very often the parties involved expect to maintain a continued relationship in order to pursue additional projects together. This puts additional pressure on the contractor to resolve disputes in the best possible way, so that the business relationship is not damaged. The Institute of Directors showed how this was highlighted in the dispute between Bombella and the Gauteng Municipality (sapolitics.co.za) regarding the Gautrain project. The Arbitration Federation resolved the long running dispute between the parties; however, there were issues
which were not resolved. The Bombella consortium resorted to litigation. The risk they (both the contractor and client) faced was severe reputational damage for both parties. In this project, there was no further work required as the project was a once-off construction, as opposed to a situation where there will be possible future similar projects.

This project was fast tracked to ensure that the system would be ready for the 2010 World Cup. As a result, Bombella suffered a loss in order to complete the project within the expedited time frame. The total cost of the project was estimated at R20b, but cost in excess of R36bn finally. Murry and Roberts Holdings (Ltd), a partner in the Bombella consortium is a JSE listed company and felt pressure from their shareholders to resolve this dispute as their decisions had an impact on their dividends and share value. By initiating litigation to resolve the dispute, the financial outlook was more positive for the shareholders and they would be able to salvage some additional costs incurred on the Gautrain project (www.sapolitics.co.za).

In order for a plaintiff to be rational, he must consider the net expected value of a trial by considering all the merits of the case, the state of the law, as well as the ideological propensity of the judges (Fon et al. 2002). In South Africa, there is no burden of proof needed to institute civil litigation, therefore the merits of the case are based on the evidence the litigants are able to produce at the trial. The state of the law surrounding civil litigation is:

- that everyone deserves a fair trial,
- a person is able to represent themselves if they choose not to have one present or cannot afford an attorney to be present in court, and
- if a defendant feels a plaintiff does not have an action, they may request a deposit be paid before commencing to trial.

Concerning the ideological propensity of the judges (Fon et al. 2002), this study will be taking this into consideration in the methodology when it comes to the decision of which forum to litigate in. The Magistrates and Judges base their decisions on different aspects and depending on the nature of the dispute, it can have an impact on the case at hand. This can often lead to a disproportionate bias. This is why arbitration is often preferred in engineering cases, the arbitrator appointed is often an expert in the field of the dispute at hand, so there is no need to get expert evidence and opinion. He can give a third party expert opinion based on the facts of the dispute.

In engineering management disputes, there are various other factors that must also be taken into account when deciding whether to pursue a claim. In these types of disputes there is often an underlying business relationship between the parties and the prospect of future business is a factor to consider. Murry and Roberts Holdings (Ltd) performance was impacted by factors beyond their control when they pursued litigation. They suffered with reduced mining, poor trading in steel, delays on Eskom power station projects and delays on the Gautrain project. Another factor that was considered by them was the strengthening of the SA Rand and the increased cost of working capital. This caused the private sector to decrease their outlay on new projects and pushed Bombella to pursue a claim in order to satisfy their shareholders.
In these types of cases, there is often a public-private partnership, where a legal battle could be very damaging for both involved. In any contractual relationship, the human element adds risk and uncertainty. Edkins and Smyth (2006) looked at case data from public-private engineering contracts and found that trust was an indicator or relationship development. There is a client driven agenda to improve performance in cost and value, with an emphasis on cost reduction. In order for there to be a continued business relationship in future contracts, there needs to be a level of trust from both parties that the contract will be finished on time and within the budget.

1.2 Research Methodology

The evaluation of the litigation process will be spilt into two sections, firstly a decision on whether or not to litigate taking into account the additional factors involved in engineering disputes, and if so, in which forum. Secondly, determining the economic cost of litigation considering the possible risks of such litigation where large companies and government institutions are involved.

This study is done using a conceptual model, where the decision whether or not to litigate will be analysed using game theory. The game will be constructed from a single, perfect information game, to a more complex, more realistic, imperfect information game. Quantitative data will be collected in the form of a survey, which is sent out to various law firms. Once the data is collected, it will be analysed to see what factors are taken into account in the decision making process.

A quantitative study was performed using data collected by a survey in order to quantify the various elements in the model. Various views and opinions were measured within the chosen sample. Both small and large law firms were selected to take part in the survey. The survey was sent out to a number of firms who had provided details on their websites, as well as physical copies delivered to larger, well known firms. The survey was emailed and delivered to the various participants, then emailed back or collected. The data obtained from the survey was analysed and then adapted for use in the theoretical model and analysed.

1.3 Research Objectives

Research has determined the efficiency of specific laws as well as legal systems as a whole, but not the efficiency of the litigation process as a remedy. The cost of frivolous law suits impacts parties who deserve a remedy and are not afforded one (Katz 1990). Using a normative approach,

1. I will attempt to determine the efficiency of the new rules of court in the litigation process
2. I will consider the feasibility of solutions put forward by other scholars to the South African situation of contract litigation
3. I will perform a survey to attempt to clarify legal expectations of the litigation process
4. I will develop a model of the litigation process

Focusing on engineering disputes, I will follow the decision making process of the parties when a dispute arises. I will consider all the factors surrounding a dispute and what causes a dispute to be litigated. Once the dispute has escalated to litigation, I will apply game theory to the decision making process, focussing on the option to settle or pursue the case until judgement.

I will consider the rise and fall of the common law hypothesis (Coase 1960), as well as the adaptations of this hypothesis. The standard theory surrounding litigation was that it was always better to settle than to litigate, however this has been challenged (Choné and Linnemer 2010). I would like to adapt a model to determine if the same is true in South Africa given the process of litigation presently being followed. The law is not stagnant and due to the nature of the law, efficiency needs to be forward looking.

1.4 Thesis Overview

In this thesis, the aim is to provide a game theoretic model of the civil litigation process in South Africa. The motivation is to examine the reasons for trial delays in practice when compared to time limits in theory.

Chapter 2 is the literature review, which is separated into the legal aspects of trial litigation and then economic and modelling sections. Chapter 3 introduces the model of litigation with the focus on the area of offer and settlement. Chapter 4 introduces the survey which was used and the data collected. Chapter 5 is a comparison of the economic and legal theory with the data collected from the survey. Chapter 6 contains conclusions, contributions as well as future work.
2. Literature Review

The literature related to this study will be introduced in various sections that relate to the legal, and economic backgrounds required to develop an understanding of the complete civil litigation process in South Africa as it would impact on engineering projects. This specific material is required to ensure that the surveys conducted and that the model developed is founded on an adequate theoretical basis – and is specifically related to the situation facing South African engineering organizations faced with the possibility of forthcoming civil litigation.

2.1 Dispute Resolution in Engineering Management

In a more litigious society, engineers have a changing role in construction projects. They are often used as arbitrators between contractors and clients, so that the use of lawyers and litigation is minimised. Disputes can become time consuming and expensive if litigation is pursued and in the end, all parties involved are disappointed with the outcome because of the costs incurred. The manner in which a dispute is resolved will have a major impact on the economic success of the project. The engineer will often support his client, even without full compensation, as he is compelled by other business considerations. That is why they will always look to non-binding mediation before arbitration or litigation.

In the USA, they have successfully implemented the Dispute Resolution Board (DRB). Menassa and Mora (2010) studied the success of the DRB by looking at the projects in which it was implemented from 1975 to 2007. The DRB was successfully implemented in a large number of high profit construction projects in the USA. They reviewed the trend analysis looking at construction data value. The main concept of the DRB is to use three neutral experts in the construction phase. The three experts become familiar with the project and the process so if a dispute was to arise, they would give a neutral third party recommendation. They also provide incentives to resolve the conflict and mitigate the escalation of disputes.

It was seen that when choosing the panel, both the owner and the contractor must be satisfied with the expert’s knowledge, there must be a freedom from bias as well as conflicts of interest. If the parties are satisfied with the experts, the decisions made by the board will be binding among the parties involved. The parties will have the freedom to accept or reject the recommendations of the board, and in that case, they will be referred to arbitration or litigation.

The trends used in the study (Menassa and Mora, 2010) to look at the growth in DRB projects were projects that adopted the DRB from start to finish, avoiding considering projects with just a start or a finish implementation. The effectiveness was measured by conflict during the construction phase of the project. The number of conflicts that were actually escalated was lower when the DRB was implemented. There was a higher rate of settlement in these projects,
so the need for litigation was diminished. This fulfilled the anticipated role of the DRB as a preventative measure for litigation.

In South Africa, there is no similar body; however, the Institute of Directors in South Africa highlighted the benefits of arbitration in light of the Gautrain dispute in 2013 (iodsa.co.za). The Arbitration Federation resolved the long running dispute between Bombella, who constructed the train, and the Gauteng Management Agency. This case highlighted the key role of Arbitration in South African business.

In South Africa, where the legal fees are higher than those of the USA, the Minister of Justice set factors to consider when resolving a dispute (iodsa.co.za). The parties should initially opt for arbitration. In an arbitration hearing, the adjudicators are specialists in the particular field, where as in litigation, experts will need to testify to the judge who is an expert in the law. In this case, 90% of the issues were resolved using arbitration, and only 10% were litigated in court.

Engineering projects have different risk factors to most other litigation. When considering litigation, the parties must also keep in mind the reputational damage. Most of the time, the parties are large, listed companies as well as government institutions and law suits are public, so their reputation can be severely damaged, whereas arbitration or mediation does not have to be made part of the public record.

In the King III Code on Corporate Governance, it is recommended that directors insure that the company has mechanisms put in place to solve commercial disputes. Arbitration is a private process, and the company need not enter into the public realm and thus avoids reputational damage.

In engineering projects, there are many relationships, all with legal factors. Many of these relationships are Public-Private partnerships. Edkins and Smyth (2006) assessed these relationships in terms of trust. Contractual and human relationships have much uncertainty and risk. They used case based data to study these relationships. All of which include aspects of political sensitivity, confidentiality and trust. Trust was used as an indicator of relationship development.

When looking at engineering contracts, it is usually a client driven agenda to improve performance in cost and value. There is an emphasis on cost reduction and meeting the contract conditions in the minimum allotted time. Edkins and Smyth looked at the result where the information in the organisational level is not passed into the contract level. This miscommunication will lead to a breakdown of trust.
2.2 Civil Litigation in General

2.2.1 Pre-trail analysis

The decision whether to litigate will be analysed using game theory, specifically a signalling game. In a signalling game, there are customarily two players as well as nature. Nature is not a player in the game, but it has a significant effect on the outcome of the game (Torres 2008). The players in the game will be the plaintiff and the defendant. The signal is the breach of a contractual obligation and the plaintiff must decide whether or not to institute an action. The nature in which the game is set is the South African court system, the amount in question is R350 000. In South African law, the plaintiff can abandon a portion of the amount and then the quantum of the claim will fall within the monetary jurisdiction of the Magistrates Court where the costs are lower, or the plaintiff may choose to claim the full amount in the High Court. If the plaintiff chooses the incorrect forum, the matter may be thrown out of court, or referred to the correct court meaning there will be extra costs involved and time wasted in getting a new court date.

The following factors must be taken into account by a rational plaintiff when deciding whether or not to institute an action:

- the probability of success of the case;
- time cost of litigation;
- monetary cost of litigation; and
- economic cost of litigation.

All of these factors will have an impact when the rational plaintiff is deciding whether or not to institute an action. Once the action is instituted, the onus shifts to the defendant in the sense that the defendant must now decide whether or not to defend the action. The defendant will consider the strength of the plaintiff’s case, the strength of his own case as well as the possibility of an apportionment of the damages. An apportionment of damages will normally be ordered where both parties were at fault. Once he has assessed the situation, he will have to decide whether or not to defend the matter, settle or let the court make a summary judgement.

Mediation and arbitration often resolves most engineering disputes. In mediation there are experts that give advice and opinions on the situation at hand, rather than a judge who gives his opinion based on the law and the contract that is presented to him. Lurie (2006) looked at how mediation is used to control project costs. He found that the manner in which the contract stipulates that disputes will be resolved has a major impact on the economic success of the project. An engineer will often support a client without full compensation as he is compelled by other business considerations. In these cases, mediation is a more suitable solution when disputes arise. Although it is non-binding, it helps the project move forward, and keeps the business relationship intact.
Menassa and Mora (2010) performed a study in America when the Dispute Resolution Board (DRB) was implemented in 1975 to 2010. The board assigns a third party to oversee the process from the start, so if a dispute were to arise, the third party is already familiar with all of the details about the project and they are able to provide a fair solution. The study showed that the DRB was effective in mediation construction disputes. There is no similar body in South Africa.

In most construction disputes, contract and tort do not collide. In a contractual claim the breaching party will be forced to perform or compensate for the lack of performance. In a tort case, the party claims special damages in respect of the breach. There are legal doctrines in place to prevent both being raised, even though parties often seek to combine them.

In the American case of *Torres v Seaburg Construction*, the plaintiff proved this hybrid theory and was awarded contractual and tort damages. Torres was the party in charge of dealing with all the subcontractors. Seaburg paid Toress in full and then it was Toress’ duty to oversee the work and pay the sub-contractors. The owner started getting involved in the time records and equipment charges of the subcontractors and withheld money from Toress. The California court awarded $450 000 for the contractual claim as well as $306 000 in special damages against Toress for interference with the subcontractors. On appeal the court held that the owner’s behaviour was improper and they internationally interfered where they should not have. There was no evidence that Toress had made any errors with regards to the equipment or that there was any time delay. Toress had the exclusive authority to review, the owner had no contractual authority to do so, and therefore there was no ground for them to refuse payment (Civil Engineering, The Law, April 2012).

If a dispute or interpretive question arises where the plaintiff has a choice whether or not to litigate, this choice involves the weighing up of factors such as the nature of the parties involved and the amount in dispute. Due to the prescribed number of days involved in the pre-trial phase and the current waiting period to have your matter heard in court, a dispute can often take in excess of two years before judgment is given. The alignment of the rules of court attempt to alleviate this problem by providing an apparently more “efficient” procedure. Even with the changes in the procedure, the question this dissertation will be positing is whether or not it is still worthwhile to go to trial?

When a prospective plaintiff carefully considers all the factors involved, they may choose to take a loss instead of litigating. This will inevitably lead to the plaintiff being left in an undesirable situation where there has been an inequitable distribution of income and this could consequently lead to a party being left without justice. All people have a constitutionally entrenched right fair trial. In South African law, there is no standards of proof required to institute civil proceedings, this can result in frivolous lawsuits and inequitable income distributions.

Litigation is usually triggered by an event which causes damage. The plaintiff knows the actual extent of the damage, while the defendant is only aware of the probability of the damage conditional on the event. In an engineering dispute, litigation is triggered by a dispute, which
can also arise without any damage. The dispute can give rise to a loss or a delay in the project, which leads to all parties involved suffering a loss. The plaintiff must then decide whether or not he wants to pursue a law suit. He considers the expected value of a settlement as well as the expected gain from a trial and weighs these up against the costs of litigation. The plaintiff will then inform the defendant of the impending suit and the defendant must then decide on the offer he is going to make.

Once the defendant has information about the case being put to him, he will make an offer based on the amount of information he has. When the offer is made, the defendant bases it on the information he receives from the plaintiff, information he found at his own cost, as well as public information. He must keep in mind when making the offer, that he risks paying a frivolous claim. The plaintiff then has the choice to either accept the offer, drop the case or proceed to trial.

There may be ways for a plaintiff to ‘force’ their claim. For example, a plaintiff with a low value claim may give an impression of a more substantial claim by choosing a larger law firm to represent them. This sends a signal to the defendant that the plaintiff is willing to invest in his case, and thus the case is worth a substantial amount. This will lead the defendant to make a larger offer than he would have if the plaintiff had chosen a smaller firm to represent them.

The problem with that for the plaintiff is that if the defendant does not make a settlement offer, the case proceeds to trial and during the pre-trial process, the true extent of the plaintiff’s damages are revealed and if the claim is unfounded, the plaintiff will not receive judgement in their favour.

It is also difficult to ascertain whether there is negligence on the part of the plaintiff before trial. This may apportion the damages that the plaintiff receives which will lower the expected value of the trial.

2.2.1 Action Procedure in South African Courts.

In an adversarial system, litigation begins long before the dispute is adjudicated on and resolved by a judicial officer, the trial hearing is only the culmination of the process. The procedure involves the exchange of pleadings and documents. This process ensures that both parties have all the necessary information before the trial.

Trial action is divided into three stages, the pleadings stage, the preparation for trial stage and the actual trial hearing. The pleadings stage is the exchange of formal documents, where each litigant is required to place on record, all material facts on which their claim or counterclaim is founded. The pleadings that are exchanged are the particulars of claim and the declaration, the plea, the counterclaim, the replication, and any further pleadings that are necessary when new facts need to be placed before the court. The function of the pleadings is to define the issues in dispute as well as setting a limit to the action. The parties must establish whether their claims are good in law and establish the onus of proof.
The preparation for trial stage commences at the close of pleadings. At this stage the dispute has been crystallised and the parties are ready to collect the necessary evidence to prove their claims and defences. During this stage, notices and evidence is exchanged. This stage ends when the hearing commences.

2.2.2 Judgement at an Early Stage

If a defendant does not give his notice of intention to defend within the prescribed time limits, the matter is decided by default judgement procedures. Judgement is granted without hearing the version of the party against whom it is granted. If the defendant can show reason as to why the plea was not delivered within the time limit, he serves a notice of bar on the plaintiff. In the interest of the administration of justice, the courts will consider the rights of both litigating parties when deciding on whether to grant the defendant an extension.

2.2.3 Summary Judgement

This is a procedure designed to give the plaintiff a speedy judgement without the delay and expense of trial. When the defendant enters an intention to defend, where he has no bona fide defence, but merely for the purpose of delay, judgement will be granted by a judge in motion court.

Summary judgement will be granted where the plaintiff’s claim is based on a liquid document, where it is a liquid amount of money, for the delivery of a specific movable object and ejectment. If the plaintiff takes further procedural steps after the notice of intention to defend, he has waived his right to apply for summary judgement.

There is a way for a defendant to oppose this judgement. The defendant does so by giving security to the plaintiff and proving to the court that he has a bona fide defence.

2.2.4 Offer and Settlement in the High Court

The offer to settle in the High Court is governed by High Court Rule 34. This rule provides for an “unconditional or without prejudice” written offer made by the defendant with the aim of settling the plaintiff’s claim. The offer may be in the form of a sum of money or to deliver a specific performance. Once the offer is made, there are two choices available to the plaintiff:

- Where the defendant unconditionally admits liability, either in part or in whole, the plaintiff may accept the written offer. When the defendant admits partial liability, the plaintiff may accept the partial offer and proceed to claim the balance at trial.
When the defendant makes an offer of compromise without prejudice, and the plaintiff accepts, the plaintiff’s claim is extinguished, the action ceases and there can be no future recourse against the defendant.

There is also a difference between an unconditional offer and an offer made without prejudice. When a conditional offer is made, no reference is made to the offer at any time before judgement is given, and no reference to it may appear in the court file. There is no similar prohibition attached to an unconditional offer. This offer may be brought to the notice of the court, but only after judgement, as long as it is relevant to the issue of costs. Any party who discloses an offer to the court will be liable for an adverse costs order, even if they are successful in the action.

A court may penalise a plaintiff who refused an offer made without prejudice. This plaintiff runs the risk of an adverse costs order where he has refused a settlement offer made without prejudice and the proceeds of the trial and the court grants judgement in their favour, but for a smaller amount than was originally offered by the defendant. The court may refuse to grant legal costs incurred if the offer was turned down because the plaintiff should have accepted the larger offer made by the defendant when it was made instead of incurring the additional costs of trial.

The written notice of settlement must clearly state whether the offer is being made unconditionally or without prejudice, if the settlement will be accompanied by an offer to pay all or part of the costs incurred by the party to whom it was made and whether the defendant disclaims liability for the payment of costs or part thereof, as well as the reasons for such disclaimer.

The plaintiff may, within 15 day accept the defendant’s offer. Acceptance is usually made by handing a notice of acceptance to the registrar. If the plaintiff rejects the offer, he continues with the process as usual. Upon acceptance, litigation will end, and the plaintiff will not be able to bring a case with the same legal cause against the defendant.

The court will have discretion with regards to costs. They will consider the offer, the time when the offer was made and how long after it was made, it was accepted, and whether if judgement was awarded to the plaintiff, would it be smaller than the original offer. If the costs have been agreed upon by the parties, the court will have no discretion to award the plaintiff additional costs.

The defendant is obligated to perform in terms of the settlement within 10 days of acceptance, failing which, the plaintiff may apply, on 5 days’ notice to the defaulting party, through the registrar for judgement against the defendant in the terms of the settlement.
2.2.4.1 Settling a matter prior to trial

When a settlement has been reached, it is the duty of the plaintiff to notify the registrar by means of a notice of settlement. High Court Rule 41(4)\(^1\) states that unless a matter is withdrawn, a party to a settlement agreement reduced to writing and signed by the parties, but which has not been executed may request judgement in terms of the settlement by giving 5 days’ notice to all interested parties.

2.2.4.2 Settling a matter by consent to judgement

The defendant may at any time consent or confess in whole or in part to the plaintiff’s claim contained in the summons. He does this by signing a written confession to judgement which is witnessed by the defendant’s attorney and delivered to the plaintiff. The plaintiff then applies in writing to the registrar for judgement according to that confession.

2.2.4.3 An interim settlement offer

Action proceedings for damages are often a lengthy procedure subject to much delay. These delays may cause the plaintiff financial hardship, and interim payments can be devised to eliminate the hardship and shorten the litigation process. In terms of High Court Rule 34A(1) an offer of interim payment can only be made in respect of an action for damages resulting from personal injury or the death of a person. In such an event, the plaintiff may, at any time after the expiry of the time within which a notice of intention to defend may be delivered, apply to the court for an order of interim payments as a contribution from the defendant towards the plaintiff’s medical costs and loss of income arising from the death or disability of a person.

The court will exercise discretion and the amount may not exceed a reasonable proportion of the total amount of damages claimed. The court takes into account all relevant circumstances when determining what the plaintiff is likely to recover in the case, should they be successful. No interim settlement order will be made, unless the defendant has admitted his liability in writing, the defendant is insured with regards to the plaintiff’s claim or the plaintiff has obtained judgement against the defendant.

This order is not pleaded or disclosed to the trial court until all the relevant issues have been determined. In an action where an order for interim costs has already been made, the action may not be stopped or withdrawn without the court’s consent.

\(^1\) As stated in the Uniform Rules of Court Act 2012
2.2.5 Preparation for Trial

This is the stage where the most information is revealed to the parties. It involves the discovery of documents, disclosures of witnesses, inspection of evidence and further particulars. In addition to these steps, a pre-trial conference is held to try shorten the litigation process by getting the parties to agree on key administrative details and relevant issues.

After the close of pleadings, the matter is set down for trial. As a general rule, a party is not entitled to be informed, prior to trial of the evidence which the opposing party intends to present at trial. However, there are limits to this principle. The major limitation is that a party is entitled to all the documentary evidence which the opposing party intends to use at trial. The purpose of this procedure is to allow the parties to sufficiently prepare for trial. Documents include, all documents and tape recordings, documents which are in the possession or under the control of the party and all documents relating to any matter in question in the action.

2.2.6 The Trial and Judgement

The adversarial system in South Africa is based on the principle of two adversaries, the plaintiff and the defendant, confronting each other in a neutral court before an objective adjudicator. The judge will find in favour of either the plaintiff or the defendant based on proof on the balance of probabilities. The trial phase is chronologically divided into a number of phases beginning with the determination of the primary onus and opening arguments, continuing with the calling and questioning of witnesses, a possible request for absolution, closing arguments and ending with judgement.

In the South African system, the judge plays a more passive role, limited to ensuring that the evidentiary and procedural rules of trial are not infringed. The judge may sometimes intervene in the process to ask questions to clarify issues, but his main function is to assess evidence in order to reach a judgement.

2.3 Game Theory

2.3.1 Introduction

The earliest use of a game theory model to adjudicate a dispute is in the Talmud, a compilation of ancient law and tradition during the first five centuries, which serves as the basis of Jewish religious, criminal, and civil law (O’Neil, 2009). A particular section, concerning a marriage contract, baffled scholars for almost two millennia, until 1985, where it was recognised that this problem displays a solution as determined by Jewish scholars that corresponds to modern
game theory. The problem is as follows, when a man dies, his estate will be divided between
his three wives in a proportion of 300, 200, 100. But what would happen if the estate has a total
value less than 600? O’Neil set the answer out as follows:

<table>
<thead>
<tr>
<th>Estate</th>
<th>Debts</th>
<th>100</th>
<th>200</th>
<th>300</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td></td>
<td>33 1/3</td>
<td>33 1/3</td>
<td>33 1/3</td>
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<tr>
<td>200</td>
<td></td>
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</tr>
<tr>
<td>300</td>
<td></td>
<td>50</td>
<td>100</td>
<td>150</td>
</tr>
</tbody>
</table>

Table 1: An Estate Problem set out by O’Neil

O’Neill (2009) defines the problem which is addressed by a bargaining game with non-
transferable utility as each wife has a claim to land and equal divisions seem inappropriate. He
defines the game as a strategic game of sequential offers, where at specific times, t=0, 1, 2..., the
land can pass from one player to another through seizure, or it can be divided permanently
by agreement. A proposer will make an offer to the current claimants of the land of a specific
division, the parties will simultaneously announce if they accept, if all the parties accept, the
land is divided into permanent shares, if a party refuses, the land is seized. The next set of
claimants is approached by a new proposal that is chosen independently of past events. This is
a stochastic game where each stage depends on the joint decisions of the players in a previous
stage and a chance event.

Aumann and Maschler (1985) provided the initial game theoretic analysis of a similar Talmud
problem involving the division of a garment, rather than the division of an estate, where they
set out 3 Talmud explanations and one game theoretic explanation for the bargaining problem.

(i) The contested garment, which states that two hold a garment, one claims it all and
the other claims half, then one is awarded ¾ and the other ¼.

(ii) More/less than half is like the whole/ nothing, which entitles a lender to a lien. When
the entire property is worth less than half of the loan, the borrower may dispose of
it.

(iii) Coalition formation, where creditors will empower each other, the third employs
the second to deal with the first.

(iv) The cooperative game model, where the consistent solution is the core of the
corresponding game. The authors develop a bankruptcy game which corresponds
with the problem to provide a game theoretic solution to the biblical problem.
2.3.2 Game Theory in Law

The most basic theme that emerges from settlement literature is that the settlement process acts as a type of screen, sorting cases from the less severe, those with lower damages, to the more severe that are expected to go to court. Usually the more severe cases involve larger damages. The fact that some cases do go to trial may be viewed as an inefficiency, however trial is necessary to develop case law and demonstrate the potential costs associated with various contractual decisions. In other words, the possibility of trial may lead to greater care and more efficient choices overall.

Inefficiency in law results in major costs to all parties involved, this is because as the stakes increase, theory states that the probability of litigation over settlement increases (Fon et al., 2002). Rational parties are willing to settle when the costs of trial outweigh the amount in dispute; however, the nature of a party may lead to factitious litigation. If a party is willing to litigate, no matter the cost, it puts an additional burden on the courts and squanders resources. Judgements create law through the principle of stare decisis and if decisions of the court are inefficient or unnecessary, they are carried through the system until the law is repealed or amended. It is not possible to address all sources of inefficiency in law; however, by ensuring that litigation is efficient, costs will be reduced to all future litigants.

Initial analysis of law using economic theory found that judicially created laws have a comparative advantage over legislation in generating efficient rules because of the “evolutionary selection through adjudication and the gradual accretion of precedent”. (Fon et al. 2005). When courts were established, the state did not control the court system through the rule of law. Each individual court functioned independently and a prospective plaintiff would approach a court based on society’s perceptions of how just and fair the court’s results are. Due to the competition between the courts in the formative period of the Common law, the legal system tended towards efficiency and these efficient judgements formed precedents. Rubin (1997) argues that the pressure for case law to evolve efficiently rests on the desire for specific parties to a case to create precedent because they have interest in future similar matters. Where these parties have a future interest and the current rule is inefficient, they have an incentive to force litigation until the rule changes in their favour. If the current rule is efficient, there is no incentive to change it.

In order for a plaintiff to be rational, he must consider the net expected value of a trial by considering all the merits of the case, the state of the law, as well as the ideological propensity of the judges (Fon et al. 2002). In South Africa, there is no burden of proof needed to commence civil litigation, therefore the merits of the case are based on the evidence the litigants are able produce. One of the most prominent states of the law surrounding civil litigation is that everyone deserves a fair trial before an impartial judge. People are able to represent themselves if they cannot afford an attorney to represent them in court and if a defendant feels that a plaintiff does not have a legitimate action, or that they cannot afford an adverse costs.

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2 This is a fundamental human right found in Section 34 of the Constitution of South Africa 1996
order being given against them, they may request a deposit be paid before commencing to trial. However, these safeguards often fall short in preventing factitious litigation and the South African courts are at a point where it may never be economically viable to go to trial and recourses are wasted, where they should be geared towards providing solutions to people who have suffered damage.

Actions taken at one point may also influence future action, for example, when D makes a counterproposal to P’s original proposal, it is limited to the original proposal, so that bargaining in good faith requires that demands do not increase over time (Daughety 1999).

Choné and Linnemer (2010) investigate the strategic effects of case preparation in litigation. When litigants invest in case preparations with the purpose of improving their position at trial, the informed party, usually the plaintiff makes the initial decision to invest, and the uniformed party, based on this decision will make a settlement offer. This investment decision is seen as a screening game which leads to a settlement or a trial, and this investment decision is also seen to have a signalling effect. This paper describes how a potential litigant can use this investment to manipulate the other side’s beliefs and therefore their incentives to settle. A defendant is not able to observe the amount that the plaintiff has invested in his case, but the choice of counsel is a good indicator. This investment involves a sunk cost, which will increase the expected value of the trial. In South Africa, it is only plaintiffs with a strong case and the means to invest that approach the larger firms, therefore the system has become tailored for plaintiffs with large damages and corporate clients. This implies that only plaintiffs with strong cases will invest and for expected low level damages, the costs will exceed the return, however, this is only the case where information is available to the parties. In reality, the parties have little information about the other’s case prior to discovery.

Where a low level damage plaintiff is able to mimic a plaintiff with a more serious case, they will make a larger investment in the hope that the defendant will make a larger settlement offer (Choné and Linnemer, 2010). However, some of the time, the defendant is aware of this strategy and the following equilibrium pattern develops:

- Plaintiffs with strong cases who invest under circumstances where information is available, maintain this decision where information is limited.
- Plaintiffs with weak cases who do not invest where information is available, are now indifferent to investing where there is limited information. When the defendant has observed that the plaintiff has invested, he makes a settlement offer, which he randomizes between high and low as he is aware that there is an opportunity for a plaintiff to bluff. If the plaintiff does not make an investment, the defendant will make a lower settlement offer.
- Plaintiffs with a stronger case, who believe that they will earn a greater amount in trial will reject the offer and proceed to trial and those with weaker cases will accept the offer if it is above their bottom line. Plaintiffs with very weak cases will accept all offers and earn an informational rent.
Where an intermediate plaintiff’s investment amounts to a bluff, it could lead to a factitious\textsuperscript{3} case going to court. The defendant may make a low offer, which does not even cover the investment made by the plaintiff and the parties will go to court. These plaintiffs regret their decision to go to court. Whereas a strong plaintiff and a very weak plaintiff do not regret their decisions.

The probability of trial increases with the strength of the case, however, this model is in direct contrast to theory (Choné and Linnemer, 2010) and it is seen that the probability of trial may decrease with the strength of the case. The litigation game will be viewed as an option, where the plaintiff’s bottom line is $K$, the strike price and the plaintiff will exercise the option when the defendant’s offer exceeds the strike price. If the plaintiff feels that his case is strong, his strike price will be higher as his expected value is higher than those with weaker cases are. The plaintiffs with weaker cases will be more willing to settle before discovery, as at that point, they must make their case known to the defence.

Choné and Linnemer (2010) explain why the previous logic fails and term this the selection effect. It was originally assumed that the more demanding the plaintiff, the less likely they would be to accept a settlement, but the selection effect states that, the larger the expected damage, the larger the probability of investment and in turn, the larger the probability of settlement. This is the strategy used by attorneys to reduce the trial costs, and it can even outweigh the socially inefficient increase in the sunk costs.

When discovery approaches, even the plaintiff with the strong case is at a risk, because prior to discovery, they are unaware of the defences. Once these defences are made known, their case may no longer be as strong as was initially assumed.

The probability of trial lands up being driven by two forces, the selection effect and the usual assumption that a plaintiff with a strong case will not be likely to settle.

If the damaged party claims compensation from a potentially negligent defendant, he will invest in pre-trial efforts. The case preparation involves sunk cost, which have the effect of raising or reducing the reward. Choné and Linnemer (2010) illustrate through a signalling game how an investment decision by a plaintiff can be used to manipulate the defendant’s beliefs and their incentives to settle. Parties do not know the exact amounts invested, but the choice of counsel is a good indicator. He assumes that only a plaintiff with a strong case will invest in a prominent law firm under symmetric information, but under asymmetric information, the plaintiff becomes indifferent to investing and may invest to try receive a higher settlement, even if the case lacks merit.

This amounts to a bluff, where the parties may land up in court defending a frivolous case. Choné and Linnemer (2010) refer to H as a high investment and L as a low investment, using the same notation, H refers to representation hired on a fee basis as a high investment and L refers to representation hired on a contingency basis, which is a much lower investment. The choice of law firm is also a good indicator as prominent law firms will not take a case on a

\textsuperscript{3} It is defined by the Mirriam Webster dictionary as “produced by a special effort”. Where the plaintiff forces or goes through a special effort to ensure that their case without merits gets to a point of litigation.
contingency basis, as their clients can often cover the costs upfront, however, they do contingency on a limited basis where the claim is large and the defendant is able to pay. Smaller firms take on contingency clients more often as their clients are not able to cover the fees before the trial. This results in a situation where the case preparation stage is often tailored towards plaintiffs with large damages.

This is in contrast with earlier authors\(^4\), who stated that when the amount of damages in question increases, the probability of trial increases; here it is assumed that the probability of trial increases with the strength of the case. A frivolous plaintiff can often claim exorbitant amounts in damages, but does not want the case to go to trial because he is aware that the case lacks merits, so he is ready to settle out of court. When a plaintiff with a weak case chooses to bluff, he will regret the decision if the case goes to court.

This has been termed the Selection Effect, where, in distinction to earlier theories, the larger the expected damage, the larger the probability of investing in the process and the larger the probability of settlement as this strategy will reduce trial costs. Previously it was believed that only a plaintiff with a strong case would go to court; however, there are a large number of frivolous cases on the court roll.

In Shavell (1982) the range over which the litigants might bargain when assessments about outcomes may be different is analysed as a problem of decision theory, this raises the issue of who has what information and at what stage of the game. His paper indicates different assessments of P and D as to the likelihood of success at trial. The role of information in his paper was very important, as it focused on informational differences and rational behaviour. Both P and D’s attorneys have potential estimates of what the court is likely to do with any particular evidence. There is uncertainty by P and D about J and uncertainty by P about what D knows.

P and D can predict what J will award, so here they face a similar level of uncertainty, this is regarded as imperfect information, in contrast to the asymmetry that exists between P and D with respect to the information that D has. If actual damage was common knowledge between the parties, and P and D truly knew exactly what J would choose as an award, the resulting knowledge would be perfect information.

2.3.3 The Prisoner’s Dilemma as a precursor to Legal Game Theory

In 1950, Dresher and Flood (1950) carried out an experiment, which introduced the Prisoner’s Dilemma. Flood published her series of experiments in 1952. She set out to test the axiomatic structure of the Von Neumann-Morgenstern’s (VNM) theories concerning games. She asserted that theory is something that needs to be tested experimentally, and must be rejected for any

\(^4\) Bebchuk (1984) and Wilde (1986)
application where it fails to meet the condition. The theory of games was yet to be tested in an experimental way.

The two person zero sum game model was applied to help in the understanding of parlour games, but it did not predict the outcome of a chosen method of play, nor did it describe how a person would actually play. In real life conflict situations, identification of flaws in one’s opponent’s habits is turned to one’s advantage. Pure strategies will bring forth an error on the part of the opponent, which will ultimately lead to a draw. Flood (1950) also criticized the utility concept on the basis that it was not suitable, as it will not find application in real life situations. She tested the axiomatic structures to find some applicability and usefulness in a controlled experimental environment in the following seven “experimental games”

The Buick Sale
A RAND employee, HK was moving and decided to sell his Buick, MF was in the market for such a car, therefore, it presented the usual bargaining problem (Dresher and Flood 1950). The value to HK was the “best” price he could get. He could take the trouble to get reasonable offers from several used car dealerships, advertise and explore various other means of disposing of the car.

The estimate would then be discounted by a nuisance value of $\delta$, which is an estimate of $s$ and has a probability distribution of $S(s)$. The value to MF is the lowest price that he would pay, $p$, with a probability distribution of $P(p)$. Both attached additional value to the completion of the deal without the need for further searching.

They employed the services of a trusted used car dealer who would give his buying and selling price, and MF would pay an intermediate amount. Game theory predicts that no such transaction would occur if either party could do better by another action. The payoff matrices were specified and there is nothing in the rules of the game preventing the players from making a side agreement.

Game theory predicts that the players will collude and choose a value that would maximise their joint return, and at the same time, they would agree on a side payment. They are unable to complete the transaction on the basis of game theory as it does not specify the amount of side payment needed to induce both players to reach an agreement.

Flood (1950) added the split-the-difference principal, where the parties will receive a joint gain by forming a collusion, which is divided equally by cooperatively choosing a specific strategy. This results in an even division of joint profits and a successful transaction.

The Oldsmobile Sale
TA offered his car for sale, a car that was only used for the summer (Dresher and Flood 1950). The game theoretic problem is the same as the Buick, however here the emphasis is on the estimation of the probability distributions $P(p)$ and $S(s)$ and their role in the process. MF and TA knew that the dealer who sold the car would buy it back for $225 and it was originally sold
for $350. the first stage of the game is when the players do their independent estimation of P(p) and S(s), where the nuisance value\(^5\) is equal to zero.

The split-the-difference solution was the one estimated by MF. Midway between the two points at $285, with a probability distribution of 0.5. MF offer TA $226 to save him the trouble of going to the dealers. TA counters by reminding MF that there were other offers of $325, but he would accept less to save him the trouble. To MF, $300 sounds like the real asking price, but he thinks this is too much as any buyer would want a larger share of the dealer margin because they are not getting the same security that they would if they bought the car from a dealer. MF suggested that they close the deal at $250, half way between $225 and the fair price of $275. TA proposed that the difference between $250 and $300 is split and the price of $275 is agreed.

The Two Secretaries

This was a two person, non-constant sum game, where the strategies and personal utility of the players differed (Dresher and Flood 1950). The experiment, E offers to give Subject 1 an amount \(M\), but to give Subjects 1 and 2 together an amount \(M+g\) if they can agree to share the larger amount. The payoff matrices are the same as those that were defined in The Buick Sale.

The game has certain rules, for example, 1 and 2 independently chose a non-negative integer, \(i\) and \(j\), which are not greater than \(g\), so that \(E\) pays 1 \(M+S_{ij}\) and 2, \(P_{ij}\). They are permitted to come to a prior arrangement before making their “independent” choices of \(i\) and \(j\). The game theoretic solution is similar to the case of The Buick Sale. In both cases, actual side payments were unnecessary since the desired result can be \(i=j=g/2\).

This experiment was conducted twice with random secretaries that shared an office, who knew in advance that they were subjects of a game theory experiment. In the first trial, \(M=g=\$0.5\), the result was that \(i=j=g\), so each was paid \$0.5. In the second trial, \(M=\$0.5\) and \(g=\$1\), \(i=j=\$0.75\), so again each secretary got the same amount. This is in contrast to the proposed theoretical solution, in which they would have shared \(g\), with the first secretary getting \(M\) in addition.

Neither of the secretaries felt bound if the prizes were larger. Their social relationship had a controlling influence on their choices. In this case, it is almost impossible to take account of all the relevant factors that controlled their choices.

The Non-Cooperative Pair

This experiment was conducted to test whether the subjects behaved as they should if Nash equilibrium was applicable, or if their behaviour tends more towards the Von Neumann-Morgenstern, spilt-the-difference or some other yet to be discovered principle (Dresher and Flood 1950). In this experiment, AA and JW are familiar with the two person zero sum game, as well as with the VNM, but not with Nash or the split-the-difference principle. The non-cooperation game is where each subject is ignorant about the identity of his opponent.

\(^5\) This refers to a quick settlement amount.
The game seemed to be fully non-cooperative, with no evidence of side payments, but there may have been some implied collusion that complies with the rules of the game. The payoff matrix was set up, with 100 plays in all. After every 10 plays, the subjects could mathematically analyse the experiment. Both subjects knew the payoff matrices and each of them kept a record of earlier choices.

They were instructed to make marginal notes indicating their reasons for their reactions. The total payoffs in the end were, $0.4 to AA and $0.65 to JW. According to a Nash solution, the payoffs should have been $0 to AA and $0.5 to JW. It is unlikely that the Nash equilibrium is the correct solution. If chosen, it would be a poor solution, even when a player knows his own payoff matrix, but is misled into thinking the game is zero sum, when actually the other player’s matrix is the same.

The VNM solution would result in payoffs of $0.5 to AA and $1 to JW, which is better than what both of them actually achieved. The spilt-the-difference with side payments solution would produce consistent pay-outs for the first 30 trials, then progress to another solution. The players would learn the game rapidly and converge into the split-the-difference solution.

Nash has generalised the results of the two-person game to prove that a finite game can also have an equilibrium; however, as the Flood experiments had illustrated, they can lead to a number of undesirable results. Albert Tucker (1983) then developed the well-known story of the Prisoner’s Dilemma (PD).

Two men are charged with a joint violation of law and are held separately (the payoff matrix is shown in Table 2). Each is told:

1. If one confesses and the other does not, the former will be given a reward of one unit and the latter a fine of two units.
2. If both confess, each will be fined one unit.
3. And they have reason to believe that if neither confess, both will go free.

<table>
<thead>
<tr>
<th>II Player I</th>
<th>Player</th>
<th>Confess</th>
<th>Not Confess</th>
</tr>
</thead>
<tbody>
<tr>
<td>Confess</td>
<td>(-1;-1)</td>
<td>(1;-2)</td>
<td></td>
</tr>
<tr>
<td>Not Confess</td>
<td>(-2;1)</td>
<td>(0;0)</td>
<td></td>
</tr>
</tbody>
</table>

Table 2: Prisoner’s Dilemma

The pure strategy for both to confess is the unique equilibrium point, but both would gain more from a collusion not to confess. The game was developed into a three person zero sum game when the State was included as a player. The State does not exercise a choice, put does have certain payoffs as determined in Table 3:
Table 3: Prisoner’s Dilemma

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<tr>
<th>II</th>
<th>Player</th>
<th>Confess</th>
<th>Not Confess</th>
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</thead>
<tbody>
<tr>
<td>Player I</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Confess</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Not Confess</td>
<td>1</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

It was apparent that the game was useful for a large number of social situations. It showed that an invisible hand does not always have to lead a rational individual to an optimal outcome. When a Prisoner’s Dilemma analysis is applied to an arms race, where the conflicting nations have a choice to continue to arm or disarm, it determines that the Nash solution is not the optimal one as the arms race will persist indefinitely. This was also applied to a large number of players in The Tragedy of the Commons essay in 1968 (Hardin) which was the first time that “trust” was discussed in terms of game theory. Rapoport (1962) would eventually perform extensive analysis of the Prisoner’s Dilemma and highlight that in the presence and absence of player trust very different solutions could emerge than predicted by the Nash equilibrium.

2.3.4 Legal Settlement Models

Early settlement models were based on very theoretical models of bargaining initially developed by Nash (1950). More recent work on settlement negotiations provide a more detailed specification on how bargaining is supposed to proceed (Nash 1953). Nash’s 1950 approach is based on axioms, which Rubenstein (1982) later improved by adding a strategic approach.

Torres (2008) made use of a signalling game in his analysis of the Rape Shields law. It is the role of the prosecutor to charge based on signals from a complainant. The signal is the victim’s account of the crime where few facts are known. This interaction happens over time where each player observes the other’s actions. This model will be adapted to suit the South African court system in a civil matter in order to establish whether a plaintiff should go to trial.

The model consists of five elements, the players, the point of their actions, the available choices throughout the game, the knowledge that each player possesses when deciding to make a move and the payoffs. There are two players, the sender and the receiver, as well as nature, which are not a player in the game, but determine the type of information that will remain private throughout the game. Nature moves first by revealing an option to the sender, the sender chooses an action and signals the receiver based on the information received.

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6 A Rape Shield Law is a law that limits a defendant’s ability to cross-examine rape complainants about their past sexual behaviour. This terms also refers to a law that prohibits the publication of the identity of an alleged rape victim.
Torres (2008) assumes that the signal received by a prospective plaintiff is one that has caused damage to the plaintiff. The plaintiff gathers more data and decides whether to institute action. The model will assume the following:

1. The players act rationally
2. The plaintiff has the knowledge of the truth of the allegations
3. The decision to serve summons is based solely on the signal and the evidence
4. The actors are aware of the law

These assumptions are attempts to understand and formalize model behaviour.

Katz (1990), determines the effect that frivolous lawsuits have on the settlement of litigation. It is commonly alleged that a substantial proportion of lawsuits are frivolous and lack merit, filed only in the hope of obtaining a favourable settlement. This affects both the efficiency and fairness of civil litigation.

The fairness objection is that such suits can result in opportunistic persons obtaining payments for which they are not entitled at the expense of innocent defendants. The efficiency objection is that the rent-seeking nature of these lawsuits wastes recourses both directly and indirectly. Direct recourses include the costs of filing and defending such suits, as well as during discovery, the attempts made by the defendant to establish the merits of the case. Indirect costs arise due to the additional strain placed on the courts and the interference with genuine claims.

There are procedures in place to try avoid cases like this clogging up the system. If it is the plaintiff who does not base his case on merits, the defendant can respond with a bare denial of the allegations, this will result in avoiding a default judgement and will shift the burden back to the plaintiff. Since the threat to go to trial is not credible, the defendant may ignore the clam hoping the plaintiff will not pursue it. If the plaintiff does pursue a claim, which is not credible, the defendant can request for a deposit for costs to be furnished with the court. However, if the merits of the plaintiff’s case are valid and met with a bare denial, the plaintiff can apply for a summary judgement when he is sure that the defendant has no defence and is denying the claims as a stalling tactic (Katz, 1990).

2.3.5 Prediction of Settlement Models

The main purpose of settlement models is to make a prediction about the outcome of bargaining. The main tool used to predict the outcome is the notion of equilibrium. More recent work looked at non-cooperative game theory, while earlier work used cooperative game theory (Nash 1950). The difference is that in cooperative game theory (Nash 1950), the players bind themselves ex ante so that the solution of the game will be efficient (nothing will be left at the end), and while in non-cooperative game theory does not assume a predetermined contract to be efficient. Each of these games will be explained in turn.
2.3.5.1 Nash Equilibrium and Non-Cooperative Games

Cournot published his work, Research into the Mathematical Principles of the Theory of Wealth in 1838. In chapter 7 of this book, Cournot discusses the special case of a duopoly and utilises a solution that is a restricted version of the Nash equilibrium. The model, Cournot Competition, describes an industry structure where firms compete in the amount of output they produce, which they decide on independently, but simultaneously.

In four papers between 1950 and 1953, Nash made seminal contributions to both non-cooperative game theory and to bargaining theory. In two papers, *Equilibrium points in N-Person Games* (1950) and *Non Cooperative Games* (1951), Nash proved the existence of a strategic equilibrium for non-cooperative games and proposed the “Nash program”, in which he suggested approaching the study of cooperative games via their reduction to non-cooperative form. In his two papers on bargaining theory, *The Bargaining Problem* (1950) and *Two-Person Cooperative games* (1953) he founded axiomatic bargaining theory, proved the existence of the Nash bargaining solution and proved the first execution of the Nash program.

This strategy provides an equilibrium where no individual player can unilaterally change their part of the game and make themselves better off (Nash 1951). If \( s^\ast \) is the equilibrium profile and the game has two players, 1 and 2, so \( s^\ast = (s_1^\ast, s_2^\ast) \) and \( s_1^\ast \) and \( s_2^\ast \) are the other strategies that 1 and 2 will play respectively. Player 1 will stay with \( s^\ast \) if,

\[
R_1(s_1^\ast, s_2^\ast) \geq R_1(s_1, s_2^\ast)
\]

For every possible \( s_1 \) player 1 could choose. Player 2 is prepared to stay with \( s_2^\ast \) if,

\[
R_2(s_1^\ast, s_2^\ast) \geq R_2(s_1^\ast, s_2)
\]

For every possible \( s_2 \) player 2 could choose. As stated earlier, no player can unilaterally improve his payoff by changing part of the strategy.

These notations can be extended into a situation of imperfect information by replacing the payoffs with expected payoffs. In the case of imperfect information, the strategies and expectations are dependent on their type and must reflect the individual player’s assessment of the other players. Solutions also have to look at coalitions, in the litigation setting, collations take the form of class action suits.

2.3.5.2 Cooperative Solutions

If two people were to divide a dollar, any allocation where each person gets more than zero will be a Nash equilibrium. In 1950 Nash used this as a reference point for many seminal contributions. His approach was based on the outcome of a bargaining game, without looking
at the details of the game. By doing this, he determined that there is no need for equilibrium in order to make a prediction in a game. He instead focused on the axioms that a bargaining solution should possess in order to come up with a unique solution.

Nash’s axioms can be summarised as follows, first, the solution should not depend on how the player’s utility scales are calibrated (Binmore 1992). This means that the standard theory of decision theory should be employed. If the payoffs are in monetary terms, all the currencies should be converted to one currency. Secondly, the solution should be efficient. Third, if the players sometimes agree to one outcome, they never agree to the second one if the first one is feasible. Fourth, in a bargaining game with two identical players, both should get the same payoffs. The result is that whether the game is in utility terms, or monetary terms, the four axioms will result in a unique solution, the Nash bargaining solution (NBS).

There is a very important linkage between predictions of the NBS when using a cooperative solution. Certain conditions in the non-cooperative game will produce an efficient outcome. In a Prisoner’s Dilemma, no cooperative formulations have been developed where an individual choice of strategies will lead to an optimum outcome. The same technique has been applied to bargaining, which helps better understand institutional constraints and incentives.

Shapely (1951) developed the notion of the Core as a general concept. The Core is a set of allocations that cannot be improved upon by any collision. The foundation of Game theory is that a player can evaluate their utility in every situation. VNM developed a finite theory, but game theory evolved. Shapely differentiated between these “inessential” games, where the most significant contributions were made, and “essential” games, where he aimed to develop axioms so that unique values of games can be determined.

The characteristic value of a game is a real value of a set function, \( v(S) \), on the subsets of the set \( I \) of \( n \) players where:

\[
\begin{align*}
(1) & \quad v(S) = 0 \\
(2) & \quad v(S) \geq v(S \cap T) + v(S \cap (I - T))
\end{align*}
\]

for every \( S, T \leq I \)

\( v(S) \) is to represent the most that the “coalition” \( S \) can obtain without outside assistance. The constant sum in \( (2) \) for \( S = I \), where \( (1) \) can be dispensed with. The game is inessential iff the equality in \( (2) \) always holds. If it holds in \( (2) \) for some particular \( T \), other than \( 0 \) or \( I \), the game is said to be decomposable. If such a \( T \) consists of just one player, he is said to be the dummy.

The direct sum of the game \( \Gamma \) is:

\[ \Gamma = \Gamma^\prime + \Gamma^\prime\prime \]

Of two games with sets \( I^\prime \) and \( I^\prime\prime \) of players is obtained by the rule:

\[
(3) \quad v(S) = v^\prime(S \cap I^\prime) + v^\prime\prime(S \cap I^\prime\prime)
\]

all, \( S \leq I = I^\prime \cup I^\prime\prime \)
\( v(S) \) is again a characteristic function. If \( I \) and \( I' \) are disjointed sets, then \( \Gamma \) is the composition of \( \Gamma', \Gamma'' \) and \( \Gamma = (\Gamma', \Gamma'') \).

If \( I' \) and \( I'' \) are the same set, then the new characteristic function is the sum of the original function. The direct sum of a finite number of games is constant sum, inessential or decomposable, iff all of the constituent games are common sum, inessential or decomposable with respect to a common subset \( T \).

The scalar multiple \( I'' = \beta \Gamma \) of a game \( \Gamma \) is defined by:

\[
v'(S) = \beta v(S) \quad \text{all } S \leq I
\]
is again a game iff \( \beta \) is non-negative or \( \Gamma \) is inessential. Two games, \( \Gamma \) and \( \Gamma' \) are isomorphic iff \( I = I' \) and

\[
\Gamma = \beta \Gamma' + \Gamma''
\]

Holds for some positive \( \beta \) and inessential \( \Gamma'' \). From this game, Shapely developed five axioms that hold true in order to determine values of specific games.

**Axiom 1** \( \phi \) depends only on the characteristic functions \( v \):

\[
\phi = F(v(0), \ldots, v(S), \ldots, v(I)) = F(\Gamma)
\]

- There was doubt raised as to the adequacy with which the characteristic function describes the strategic possibilities of the general sum game. The difficulty is that the function does not distinguish between threats that damage just the threatened party or threats that damage both the parties. Therefore Shapely found that it will not apply to constant sum games unless it is restricted with an assumption of linear transferable utility.

**Axiom 2** \( \phi \) depends symmetrically on the elements of \( I \) precisely if \( \Gamma \) is defined by:

\[
v'(S) = v(S^*)
\]

Where \( S^* \) is like \( S \) where \( i \) replaces \( j \), \( j \) replaces \( i \), then

\[
\phi_i = \phi_j \quad \phi_j = \phi_i
\]

- This axiom does not take into account any asymmetry associated with the parties

**Axiom 3**

\[
\sum_{i \in \Gamma} \phi_i = v(I)
\]
• This assumes the group rationality of the players, where they all maximise their common gain

Axiom 4

\[ \text{if } \Gamma = \beta \Gamma, \beta \geq 0, \text{ then } \phi = \beta \phi \]

• The value is independent of the units in which utility is expressed

Axiom 5

\[ \text{if } \Gamma = \Gamma' + \Gamma'', \text{ then:} \]

\[ \phi_i + \phi_i' \quad \text{for } i \in I \cap I'' \]

\[ \phi_i' \quad \text{for } i \in I - I'' \]

\[ \phi_i'' \quad \text{for } i \in I - I' \]

• If there are two games played independently, they are regarded as sections of a single game. There are two special cases:
  o \( I = I' = I'' \), where the players are the same for both games where a dummy is added into game \( \Gamma'' \)
  o \( I = I - \{i\}, I'' = \{i\} \)

In order to determine the values of games, Shapely then developed theories and lemmas, which lead him to construct a table of values. This solution has been termed the Shapely Value for coalition games \( v \).

Shapley (1953) showed Stochastic games can for the strictly competitive case, with future payoffs discounted at a fixed rate, be determined and that they have optimal strategies that depend only on the game being played, not on the history. In a stochastic game, the play proceeds by steps from position to position, according to transition probabilities controlled jointly by the two players.

Assuming a finite number of \( N \) positions and finite numbers \( m_k \) and \( n_k \) of choices at each position, if when at position \( k \), the players choose their \( i^{th} \) and \( j^{th} \) alternate, the probability \( s_{kj}^{ij} > 0 \) will cause the game to stop. By specifying a starting point to obtain a particular game \( \Gamma^* \), a “stochastic game” refers to a collection:

\[ \Gamma = \{\Gamma_k | k = 1, 2, \ldots, N\} \]

The full set of pure mixed strategies are cumbersome due to the fact they take into account vast amounts of information that often turn out to be irrelevant. Shapley introduces certain
behavioural strategies, namely those that prescribe that a player has the same probability of making the same choices for his choices every time the same position is reached by whatever route. These stationary strategies are represented by N-tuples of probability distributions. A stationary strategy is not a general mixture of pure stationary strategies, since the probabilities in a behavioural strategy must be uncorrelated. Based on this game, Shapley develops theorems which he applies to examples. The conclusion he draws is that stochastic games do not have to have perfect information, but they are rather simultaneous games where perfect information can be simulated. The solution is a stationary game with pure strategies.

Extensive form games allow the modeller to specify the exact order in which they players have to make their decisions and to formulate their assumptions about the information possessed by the players in all stages of the game. Kuhn (1950) includes the formulation of extensive form games which is currently used, and some other basic theorems relating to game theory. Brandenburger (2007) made notes on Kuhn’s paper where he referenced two results of decision theory, specifically in trees that involve the decision maker and nature.

In decision theory, the player is assumed to form a probability assessment over the strategies chosen by other players and choose an optimal strategy. Kuhn defined two relationships, firstly, the relationship between global and local assessment and secondly, the relationship between global and local optimality. Traditionally game theory focused on the mixed strategies of the players, not another player’s global assessment of the first player’s choice of strategy.

Kuhn (1950) obtained two results in two parts:

1. (i) Given a system of local probability assessments by the decision maker, for example on the assessment over nature’s moves on each of nature’s information sets, there is a global assessment over nature’s strategy that yields the same probability of each path through the tree
   (ii) If nature has perfect recall and all the choice nodes are non-trivial, then given a global assessment by the decision maker, there is an equivalent system of local assessments.

2. (i) If a strategy of the decision maker is locally optimal, for example, optimal at each information set of the decision maker, then it is globally optimal.
   (ii) If the decision maker has perfect recall and all decision nodes are non-trivial, then if a strategy is globally optimal, it is locally optimal.

Flowing from (1)(ii), if you assume perfect recall and non-triviality for nature, then it is enough to know the system of local assessments to know which strategies are globally optimal. Putting this with (2)(ii), assuming perfect recall and non-triviality for both the decision maker and nature, then to determine if a strategy is locally optimal, it is enough to know the system of local assessments of the decision maker. From Kuhn’s results, Brandenburger (2007) developed formal definitions.

Brandenburger (2007) also tested to Kuhn’s theory with practical examples. Kuhn observed that perfect recall implies that a player remembers all of his choices at previous nodes and everything he knew at all of those nodes. In the example, there is a decision maker, Ann and
all other players are grouped together as “nature”. Nature’s decisions are made jointly. The decision is uncertain as far as Ann is concerned and therefore, subject to a joint probability assessment. This example serves to illustrate whether nature can have perfect recall. If you take one player, Bob and he has perfect recall, his decisions will differ from the situation of two or more players, even where they have perfect recall, but have to make a coordinated choice.

2.3.6 Place of Information in Game Theory

Poker was used by Daughety (1999) to illustrate the informational differences in game theory. If all cards were dealt face up and there were no more cards to be dealt, this would be a situation of perfect information. If cards were dealt with three cards face “up” and two cards face “down”, but no one could look at their “down” cards, this would be a setting of imperfect information. Finally, asymmetric information would involve each player being able to look at their down cards before taking action. The essence of asymmetric information is not that one party is informationally disadvantaged when compared to the other, but rather that the parties have different information to each other, but may have some shared or common information.

A card game was first used by Waldegrave (1713) who provided the first known minimax mixed strategy for a card game called *le Her* in a letter he wrote.

<table>
<thead>
<tr>
<th>Dealer</th>
<th>Stay 8 and over</th>
<th>Change 8 and under</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stay 7 and over</td>
<td>16.182 / 33.150</td>
<td>16.22 / 33.150</td>
</tr>
<tr>
<td>Change 7 and under</td>
<td>16.146 / 33.150</td>
<td>16.182 / 33.150</td>
</tr>
</tbody>
</table>


These rational behaviours, R, have the effect of eliminating poor strategies. Using a binary model where the payoff to the Dealer is 1 if he wins and 0 to the Receiver, the solution of the game is the same as the original solution contained in the letter.

The timing of the game is the source of the imperfect information. If P and D were to make simultaneous proposals, what each will do is common knowledge to all of the players. Even if all other information in the analysis is perfect, the timing of the moves will be the source of the imperfect information. Incorporating informational decisions in the bargaining model explains behaviours which could be mistaken for players acting irrationally. For example, where negotiations fail and the parties go to trial, even where both parties are aware that court is very costly. Cases often fail to settle quickly, or will only settle when a deadline approaches because of the incomplete information.
2.4 Offer and Settlement using Game Theory

2.4.1 Economic Aspects of the Overall Model
This section will define and explain the various terms, show how the uncertainty is modelled, and explain the economic aspects of offer and settlement.

2.4.1.1 Basic Issues, Definitions and Notations

- The Players and Actors

In the litigation game, there are two actors, nature and the courts. These actors are not players in the game, but have a direct impact on the outcome of the game. Nature determines the event that gives rise to the potential plaintiff’s claim. This event must have caused the plaintiff an amount of damage, patrimonial, non-patrimonial or both, in order for the plaintiff institute an action to claim compensation. Once a plaintiff decides to claim, he seeks representation and if there is no settlement, the matter goes to court.

The hierarchy of South African courts is such that claims can be addressed by the appropriate court. The magistrate’s courts address claims under R300 000, its jurisdiction was extended in 2010 by the new Rules of Court, previously it only addressed claims under R100 000. The high court has no upper or lower monetary bound and can address any action, however, if an action is more appropriate for the magistrate’s court, the matter will be referred there and the plaintiff risks his claim prescribing. The Supreme Court of Appeals is the highest court concerning all appeal matters that do not include a constitutional issue. The Constitutional Court is the highest court in all constitutional matters and can act as a court of first instance. This analysis focuses on the jurisdiction of the High court, assuming that the actors in the game are represented, either on a fee basis or on a contingency basis. A plaintiff would not make a substantial investment to retain an attorney on a fee basis for a claim of under R300 000 as there is a risk that the attorney and advocate’s costs may exceed the value of the claim.

The High Court has inherent jurisdiction in that it governs the rules of its own procedure contained in the Rules of Court, which was recently amended to extend the jurisdiction of the Magistrate’s court in order to relieve the burden on the thirteen high courts in the country. This inherent jurisdiction of the court protects the dignity of the courts by allowing them the power to discipline practitioners as well as any other order that is necessary to further the administration of justice. However, there is a limit to this discretionary power; it may not exceed the boundaries of legislation.

Pertaining to the monetary jurisdiction in the High court, there is no upper or lower bound. These results in the abuse of process where claims are instituted in the wrong court in order to try obtain costs on the High court scale. If the matter is found to be in the wrong court, it is transferred to the Magistrate’s Court. If the matter is heard in the High court without it being transferred, the court has the discretion to award costs on the Magistrate court’s scale. The High court may also hear any type of claim, unless it is expressly excluded in legislation. These
may include matters that fall within the exclusive jurisdiction of the Constitutional court, or matters that must be heard in specialised courts.

The players in the game are the plaintiff and defendant. It is assumed that both parties are represented, on either a fee basis or a contingency basis. It is also assumed that only cases that have a dispute of facts will get to trial. Defendants who lack merit or a case based on a liquidated amount will be referred to summary judgement. Relating to the plaintiffs, there are two types, those with a frivolous case and those with a genuine case. During the early phases, it is difficult to tell if the plaintiff’s case is based on genuine merits, so the defendant often has to wait until more information is revealed. However, if it is clear from the onset that the plaintiff’s pleadings lack merit, the defendant may take exception to the pleadings and they become invalid.

The nature of the parties has a role in determining the sincerity of their actions. In relation to the nature of the plaintiff, firms, unions and industries are often party to frivolous lawsuits as they have attorneys on a retainer basis and have the money to spend on a case. These resources are often squandered to try obtain a settlement, which may even be less than the amount spent on litigation costs, or even just to prove that there was a degree of fault on the part of the defendant.

A second example of a plaintiff who will engage in a frivolous suit is the plaintiff to a personal injuries claim. When a party has been injured because of the negligence of another, the nature of the defendant comes into play. For example, a customer who slips on the wet floor of a shopping centre may institute an action, even where injuries are minor because they know that the shopping centre will want to settle out of court, but in this instance, the centre of often aware that injuries only occur some proportion of the time. Thirdly, in the case of products liability where an injury is undisputed, but the defendant is aware that the plaintiff may not be entitled to damages due to contributory negligence. While the plaintiff is aware of his negligence, the defendant cannot know prior to the trial.

- **The Nature of the Parties**

This model will focus on the plaintiff claim and assume that defendants who lack merits will not go through the trial system, but will have summary judgement granted against them. This model assumes two types of plaintiffs, those who are frivolous and those who are genuine. The nature of the plaintiff will play a role in determining whether he is genuine.

A firm, union or industry are often party to frivolous lawsuits as they have attorneys on a retainer basis and have the money to spend on a case in the hopes for a settlement or even to prove the defendant was at fault. A second example of a plaintiff who will engage in a frivolous suit is the plaintiff to a personal injuries claim. When a party has been injured as a result of the negligence of another, the nature of the defendant comes into play. For example, a customer who slips on the wet floor of a shopping centre may institute an action, even where injuries are
minor because they know that the shopping centre will want to settle out of court, but in this instance, the centre of often aware that injuries only occur some proportion of the time. Thirdly, in the case of products liability where an injury is undisputed, but the defendant is aware that the plaintiff may not be entitled to damages due to contributory negligence. While the plaintiff is aware of his negligence, the defendant cannot know prior to the trial.

It is assumed in this game that there is one single offer made by the defendant and it is a restrictive one. It is also assumed that the defendant has no private information about the merits of the case. The defendant may wish to spend recourses to obtain information to assess the validity of the lawsuit, for example by paying medical practitioners, so it is assumed that the defendant will estimate his probability of success after optimal investigation, where the injured party cannot communicate the validity of their claim before the trial.

Applying this to a signalling game, the cost of signalling increases in both the genuine as well as the frivolous plaintiff’s cases, however, the cost to the frivolous plaintiff increases by a greater amount given the poor merits of the case. The overall cost of the trial increases because, the more the defendant discovers the case lacks merits, the more relevant it becomes in proving the defendant’s case.

A false claim is more likely to be investigated more intensely by the defendant, who will provide more recourses to prove the claim is false, before he can properly weigh the evidence. Thus, a false claim’s payoff will be significantly less than the payoff of a genuine one, due to the high cost of signalling in both cases.

Moreover, both claims realize that the value of having the claim litigated, irrelevant to the truth of the claim, is decreased due to the admission of the alleged defendant’s guilt. The value of a frivolous lawsuit is further reduced, as a genuine defendant will put more value on fighting the case, no matter the cost, whereas a frivolous claim will attempt to avoid a defendant’s statements under oath.

Therefore, trial is less advantageous to a false claim, as the defendant as the receiver of the signal will become better equip to distinguish the nature of the plaintiff, before the decision to defend the action in court is made.

Thus, filling a false claim results in a weak case, this deduces the values

\[ a_w - C(S)[WC] < 0 - C(S)[LC] \]

making the plaintiff more likely to be held liable, or to completely refrain from filing the case.

- The strength and weakness of the case according to the evidence

If a plaintiff knows that it is impossible for a defendant to determine the admissibility and relevance of his evidence it will affect the game play. There are many factors that come into play, the strength and weakness of each party’s argument as to the relevance of the evidence,
the judge’s inclinations to the admission of certain types of evidence and the credibility of the witnesses. These external factors make it almost impossible for the defence to determine the admissibility and relevance of the evidence before the trial.

Generally, the defence counsel would rather bear the cost of defending an action with minimal cost than offering a settlement to a party that is not entitled to anything at all. He will argue the admissibility of evidence before the trial, rather than invest in investigations to determine the admissibility, only to offer a settlement to an unjust party, or accede to a false allegation.

These external variables make the cost of signalling worthwhile to the false plaintiff, as he knows the defence will infer that the claim is genuine, rather than investigate the allegations at his own cost. Over time, the genuine cases will realise that the false cases are exploiting the signalling process and they will avoid signalling, so they will not be associated with those types of claims.

The result being that both types of payoffs will be equally high as all cases will be defended and offered a settlement, or equally low as neither plaintiff will go to trial. The more likely occurrence is that more cases will go to trial, both false and genuine in order to try seek justice for the parties who have been wronged. As a result, more cases are put on the court roll and less attention is given to the genuine cases.

Thus, a plaintiff who files false allegations deduces these values:

\[ a_{w} - C(S)[WC] > 0 - C(S)[LC] \]

making these false claims less likely to be found out in the pre-trial phases, or to deter these plaintiffs completely from filing the claim at all.

- The confidence that the parties vest in their case

According to de la Rosa (2001), an overconfident agent can overestimate the probability of success. A principal will offer an incentive contract to his agents because it is not always possible for him to monitor their efforts. Due to the agent’s overconfidence, the principal is able to offer a lower salary with higher incentives because he is aware of the agent’s overconfidence. In a trial, the attorney acts as an agent on behalf of his client, if the attorney is not confident in the case, he will advise the client not to peruse it, but in some situations, an attorney may appear to be overconfident to convince the defendant that the plaintiff’s case is better that what it actually is.

Both types of defendant, the false and the genuine are aware of the constraints of their case, however, these constraints only affect the strategy used to play the game. The genuine plaintiff must send signals and because of his sincerity, he will see to it that he is compensated fully. The false plaintiff will only send minimal signals to reduce the cost of signalling in the hopes of a settlement offer. However, if the defendant knows that the plaintiff has no case and still
wants to go to trial, he will request the plaintiffs to put up security for the costs of the matter. The payoffs may vary because a defendant may or may not be able to distinguish a false plaintiff from a genuine one.

2.4.1.2 How Uncertainty is Modelled

Models with perfect information specify parameters of the problem with no uncertainty attached. Liability is known, damages are known, the parties know what J will do and all the costs are known. Models with imperfect information involve probability distributions, thus the uncertainty in the model is symmetric. For example, if the damages are unknown, all parties will use the same probability to describe the likelihood of damages at a particular value, \( d_L \) (L for low) with a probability of \( p \) and \( d_H \) (H for high) with a probability of \( 1-p \), then the expected damages would equal \( E(d) = pd_L + (1-p)d_H \). P’s estimate is \( [E_P(d)] \) and D’s estimate is \( [E_D(d)] \). J is assumed to learn the truth as the case goes to trial. The model is not limited to \( d_L \) and \( d_H \), but can award any number in between. P and D are in agreement about the costs of going to trial, and there is no rational basis for incurring those costs. If they were to reach an agreement through a bargaining process, they would be able to split the surplus between themselves.

With asymmetric information, the players have different information and different probability assessments over uncertain aspects of the game. Each player’s costs might be unknown to the other, damages may be known to P and not to D, the likelihood of being held liable might be known to D and not to P. P and D will also have different estimates as to what J will decide. All of these differences in information will influence predictions.

Using the poker analogy, once you have seen your down cards and you observe an ace of spades and a king of hearts, what do you do with that information? You will know how many players there are and you are able to observe all of the up cards, you also know how many cards are left in the deck. Given your cards, you can construct a probability estimate of what the other players have and know what estimates they may construct about what you have.

This logic can be applied to a settlement model with asymmetric information, if there is an element to of the case with incomplete information, then that element can be thought of to take different values. For example, if P knows the true level of damage and D only knows that it is between \( d_L \) and \( d_H \), D’s model will cover all the levels in that interval. This is an example of one sided asymmetric information, where one player is privately informed about some element of the game and the other must use a probability model. The probability model used by D is known to P. Two sided asymmetric involves both players having private information about either the same or different elements.
2.4.2 Economic Aspects of the Offer and Settlement

It is assumed in this game that there is one single offer made by the defendant and it is a restrictive one. It is also assumed that the defendant has no private information about the merits of the case. The defendant may wish to spend recourses to obtain information to assess the validity of the lawsuit, for example by paying medical practitioners, so it is assumed that the defendant will estimate his probability of success after optimal investigation, where the injured party cannot communicate the validity of their claim before the trial.

Applying this to a signalling game, the cost of signalling increases in both the genuine as well as the frivolous plaintiff’s cases, however, the cost to the frivolous plaintiff increases by a greater amount given the poor merits of the case. The overall cost of the trial increases because, the more the defendant discovers the case lacks merits, the more relevant it becomes in proving the defendant’s case.

A false claim is more likely to be investigated more intensely by the defendant, who will provide more recourse to prove the claim is false, before he can properly weigh the evidence. Thus, a false claim’s payoff will be significantly less than the payoff of a genuine one, due to the high cost of signalling in both cases.

Moreover, both claims realize that the value of having the claim litigated, irrelevant to the truth of the claim, is decreased due to the admission of the alleged defendant’s guilt. The value of a frivolous lawsuit is further reduced, as a genuine defendant will put more value on fighting the case, no matter the cost, whereas a frivolous claim will attempt to avoid a defendant’s statements under oath.

Therefore, proceeding to trial is less advantageous to a false claim, as the defendant as the receiver of the signal will become better equip to distinguish the nature of the plaintiff, before the decision to defend the action in court is made.

It is also important for a plaintiff to consider the nature of his defendant. If the defendant is a so-called “man of straw”, it will not be worthwhile for the plaintiff to institute action, because ever if he does win, the defendant has no asset to pay the judgement costs. The financial position of the plaintiff can also play a role where the defendant believes that his case is stronger and the plaintiff will not be in a financial position to pay costs. In this situation, the defendant will request that the plaintiff furnish security with the master of the court to cover the defendant’s costs.

The primary participants are the litigants, namely the plaintiff (P) and the defendant (D), some models allow for multiple P’s or D’s and this will have an effect on the model, which will be discussed later with reference to player types. Secondary participants include the attorneys for the two litigants (AP and AD), if represented, and the court, should the case go to trial. The court’s decision is made by a judge (J).

There is a standard assumption of uncertainty in most litigation models, involving either the amount of damages or liability, or both. At court, it is assumed that J will learn the truth and
make an award of the true value, based on actual liability and damages once it has been established. Moreover, J is assumed to have no strategic interests at heart, unlike P and D.

Uncertainty also enters the analysis where something relevant is not known by either player. These probabilities are dealt with by adding another player, nature (N), whose actions influence the players via probabilities.

2.4.2.1 Actions and Strategies

An action is something that a player can do when it is their turn to make a choice. The most commonly modelled action for P and D involves making a proposal. This is in the form of a demand from P to D or an offer from D to P. This then leads to an opportunity for another action, which is a response to the proposal, which takes the form of acceptance or rejection of the proposal. There is also the possibility of a counter action, such as a counter proposal. This model will allow for multiple periods of proposal/response sequences of actions.

2.4.2.2 Outcomes and Payoffs

An outcome for the game is the result of a specific strategy being played. Thus any outcome may involve a transfer from D to P reflecting a settlement, or a transfer by order of the court, or it may not even involve a transfer at all if P chooses not to pursue a trial. In some cases, the reputation of the parties may be an interest, and therefore, the outcome should also specify the status of the party’s reputation.

For each player, each outcome has an associated numerical value called a payoff, which is usually a monetary value. For example, a settlement is a transfer of money from D to P, for A or experts it may be a fee. When risk is involved, the payoff may be represented as the utility of net wealth, rather than in monetary terms. Payoffs that are strictly in monetary terms are viewed as reflecting the risk neutral behaviour of the players.

Payoffs need not equal expected awards, since the parties incur costs. The most common cost that is considered is the court costs (k_P and k_D). Court costs are the costs involved in preparing for and concluding a trial, as such costs may be avoidable, they will influence a player’s decision. Generally costs involved in negotiations are ignored, but the effect of negotiation and settlement may result in the lengthening of the process, therefore in my analysis, they will involve a time cost.

The total payoff, i that is where i= P,D, is detonated as R_i. Generally the players will try to maximise their payoffs, so that P makes a choice to maximise R_P. For convenience, D’s payoff is written off as an expenditure, therefore D tries to minimise R_D (rather that maximise −R_D). Since strategy profiles yield payoffs, this means that payoffs are determined by strategy
profiles. Thus if player i uses strategy $s_i$, the strategy is detonated by $s$, then we can write the dependence for the player i as $R_i(s)$.

2.4.2.3 Timing

The sequence of play and the horizon over which negotiations occur are issues of timing and time. This begs the questions, do P and D make simultaneous proposals or do they take turns? Who goes first and when and will this influence the outcome? Do both parties make proposals, or does one? Can players choose to accelerate or stall negotiations?

Time enters settlement in two ways, firstly, do the participants move simultaneously or sequentially? This is not limited to whether P and D make choices at different points, more significantly it involves whether the second mover observes the first when deciding on their strategy. Two players that move at different times, that don’t directly influence each other’s strategies are said to move simultaneously, their choices together influence the payoff.

In a bargaining model, the second mover’s choice is influenced by the first mover and both the players know this, and this influences the first player’s choice as well. Therefore unlike symmetrical models where the choices are made simultaneously, bargaining models are asymmetrical.

The second way in which time affects the game is the length of the horizon over which decisions are made. The main stream of research suggests that the bargaining horizon is infinite, to eliminate the effect of end of horizon strategic behaviour. This model however, will have a finite length. The negotiation will at some point terminate, although setting of a court date is not an iron clad commitment, few would argue that an infinite number of continuances is permitted. The restriction of time also assists in making more precise predictions. If a case goes to trial, the trial will represent the last possible point of negotiations, and that is where the majority of the costs would be involved. If negotiations were to continue during the trial phase, the costs involved must be included. As the trial proceeds, the portion of the costs that become sunk are larger and the portion of the avoidable costs shrinks. This problem has been addressed in papers by Spier (1992) and Bebchuck (1996).

2.4.2.4 An Example of Settlement Negotiation

Looking at the negotiations between P and D, using numerical simplifications, assume the source of uncertainty is D’s liability. Damages and court costs are known to all. There are no attorneys and J will award damages if D is found to be liable. Let us consider two bargaining stories:
(i) P makes a demand of D, followed by D accepting or rejecting the demand. Acceptance means that there is a transfer from D to P, rejection means that J will order a transfer from D to P, the two transfers need not be the same. Both parties will pay their own court costs. If D is indifferent from accepting and rejecting the proposal, he will accept it.

(ii) D makes an offer to P, followed by P accepting or rejecting the offer. Acceptance means a transfer from D to P, rejection means that J will order a transfer from D to P, again the two offers need not be the same and both parties will pay their court costs. It is common knowledge that if P is indifferent from accepting and rejecting the offer, he will accept it.

If the level of damages $d = 100$ and $L = 0.5$ be the likelihood of D being found liable by J for damage $d$. Let the costs for both players be the same = 10. The expected compensation $Ld$ must be greater than the court costs, so that D will reject P’s offer in case (i), or offer too little in case (ii) so that P will still go to trial. This case will also assume that there is no possibility of the bankruptcy of D. in all of the above, both players are rational and let $s$ be the settlement proposal.

- The Case where P makes a Demand

It must first be determined if settlement is possible. P must anticipate D’s choice when faced with P’s demand. D and P both know that if the case goes to trial, D will spend either $d+k_D$ or $k_D$ (110 or 10), with the first probability $L$ or the second probability of $(1-L)$, thus D’s expenditure at trial is $Ld + k_D$ (that is 60). P’s expected payoff will be $Ld - k_P$ (that is 40). Thus D will accept any settlement demand not exceeding this expected expenditure at trial

$$s \leq Ld + k_D$$  \hspace{1cm} (1)

P wishes to maximise his payoff, which will depend on his demand and the choice made by D. (1) represents the maximum settlement demand that P can make, which will exceed P’s payoff from court. Thus P maximizes the game by choosing $Ld + k_D$ as his settlement demand, which D will accept seeing that D cannot do any better by rejecting the proposal and facing trial. The information is imperfect in the way that P and D share the same assessment about the trial and the outcome with respect to liability.

- The Case where D makes an Offer

We now look at P to try find admissible settlements. P will accept any offer that will yield at least what he will get in court:

$$s \geq Ld + k_P$$  \hspace{1cm} (2)
d wishes to minimize his payoff, which will depend on the offer he makes and the choice of P. thus, D will minimize his payoff by choosing \( Ld - kp \) as his settlement offer, which P will accept since he cannot do better by rejecting the proposal and going to trial. Information is imperfect the same as it was in the previous case. The prediction of this game is that the case will settle, resulting in the transfer from D to P for \( Ld - kp \) (which is 40).

- The Efficiency of Bargaining

One of the implications of forgoing a trial is that there will be a surplus available if the parties do not go to court. Whichever player moves last will have an impact on what happens to this surplus. If D was to pay P \( Ld \), no matter what procedure used, the fund that P and D would have used for court costs will go into the surplus, which they will then split in some fashion. If the process involves P making a demand on D, choosing to accept or reject, then P will get the surplus and vice versa. This suggests that the two cases looked at are the extremes, which is the bargaining range, and the actual bargaining yield will be something inside this range. In this case, the bargaining is efficient, as no cases went to trial. All the information was symmetric and the first mover made a take-it-or-leave-it offer. Efficiency will fail to hold where there is asymmetric information, not because of the mistakes of players, but because of the recognition by both players that the information which is asymmetrically distributed will impose a cost on the bargaining process, which will often fall to the better informed party.

2.5 Context of this Study

In order for parties to have their dispute heard before a judge, they have to go through formal litigation procedure as set out in the Rules of Court\(^7\). When parties enter into a contract, the obligations vest over time, so there is a level of uncertainty. If the performance was due on the date of conclusion of the contract, there would be no uncertainty, and therefore no need to include a dispute resolution clause (Posner, 2004). If parties decide to enter into a contract without this clause, there dispute is then governed by the Common Law and will be resolved by a lengthy court process, which may end with the parties being left worse off than their initial positions. Therefore, to ensure a remedy, parties increase the cost of contracting, which will also affect the cost of performance. However, this is not always possible to do. In South Africa, the pre-trial process is governed by the rules of court, where parties have a prescribed number of days in which to submit the relevant documents, however, once the pre-trial process is completed, the case is placed on the court roll, where it may be as long as two years before the case is heard before a judge.

\(^7\) As contained in the Supreme Court Act 59 of 1959
Due to the cost, both economic and time cost, parties who deserve a remedy do not approach the courts and often parties who should not litigate clog up the system. If a person feels entitled to damages, they may institute an action as a bluff in order to induce some type of settlement from the defendant. If the settlement offer is not satisfactory, the parties will go to trial where neither party had an intention to litigate.

Analysis of law and economics has focused on the trial procedure and the decision between litigation and settlement. Theory states that litigation is always preferable over settlement when the plaintiff has a strong case, however, parties will try avoid trial at any cost, so if a plaintiff is offered a settlement above his bottom line before the trial date, he will accept, no matter how strong the case (Posner 2004). This analysis will focus specifically on the pre-trial processes from the point of view of the plaintiff in order to determine where the process slows down and how factitious plaintiffs pass through the system.

As this research focuses on the entire process as a whole, rather than a situation between specific parties, this game will be described as a repeated game where the parties are able to take previous decisions into account when deciding to litigate. The decision points will be plotted on a binomial tree where at each node, the expected return of litigation changes due to the additional investment made by the parties in their case. The asset is his claim and the strike price is the plaintiff’s expected return. The life of this option will continue until the offer made by the defendant exceeds the strike price, and at that point, the plaintiff will exercise that option and the parties will settle out of court, much like a barter option.

In general, the strategy of the players is a complete list of actions to be taken at each of the player’s decision opportunities and depends on, the observable actions taken by the other player in the past, the actions taken by the player himself in the past, the information that the player currently possesses and any exogenous relevant actions that have occurred that the player is aware of. An example of this is speculations regarding an award, for example from a personal injuries tariff in the law of delict.

There are three phases in the litigation process, the pleadings phase, preparation for trial and the trial itself. In each phase, the parties are faced with various decisions. Once a plaintiff has decided to institute action, he issues a summons which is delivered to the defendant. The defendant will either, offer to settle or defend the action by sending a notice of intention to defend and a plea. If the defendant decides not to defend the action, he will have summary judgement granted against him. The defendant may defend the action without merits, if the defence is not bona fide, the plaintiff will apply for exception, on the grounds that the case lacks merit.
Assuming the case is defended, the plaintiff uses the defendant’s signal to decide on his next move. If the plaintiff’s case is one based on a liquidated amount, he will apply for summary judgement, if not; he will draft a replication to the defendant’s plea. After all the pleadings have been exchanged, pleadings are closed and no further notices pass between the parties, unless there has been an irregular step.

Once pleadings have closed, the parties will start to prepare for trial. The plaintiff will set the matter down on the court roll and brief counsel. In this stage, witnesses are subpoenaed and consulted. Discovery notices are sent to compel discovery of outstanding documents. In the preparation for trial, the parties find out more information about the opponent’s case and the defendant is able to make a more precise offer to prevent the case going to trial.

Nature determines a situation $x_i$. This event affects a potential plaintiff as it causes one party to suffer damages through the fault of another. The plaintiff makes a decision whether or not to claim these damages. This decision is made using prior information from, history, anecdotal information or the beliefs of an expert litigant. In nature, there is a range of events that can occur, which could all give rise to damages. There is a concave relationship between the value of the claim and the number of claims that are pursued. As the value of the claim increases, the number of claims tends to zero, because as the number gets infinitely larger, there are less occurrences of events with such a great amount of damage. However, this number never reaches zero, with the rise of class action law suits, there can be cases that are worth billions.

An example of an event is a prospective plaintiff who has suffered personal injury in the workplace, he makes his decision based on the history of claims that have been settled by his employer in relation to personal injury, anecdotal information from other collages and once he decides to litigate, he will seek the counsel of an expert litigator. The litigator will derive his knowledge from past cases, $\Sigma t \text{payoffs to litigants}$. In South Africa, personal injuries claims are based on a tariff, this will guarantee a potential plaintiff a specific amount based on the extent of the injury.

Due to the nature of the legal system and the reliance that a plaintiff has on past cases, the game will be a repeated game, rather than a series of single games. This model focuses on the entire civil system, rather than a case between two parties. In a repeated game, there is an amount of common knowledge and a particular equilibrium is expected to govern play. This type of game relaxes the assumption of fully rational behaviour and focuses on the adaptive process by which players learn from the history of play. An optimal strategy is one that maximises expected payoffs, given prior payoffs.

In the litigation game, previous payoffs are given in case law as well as tariffs, the structure of the game is common knowledge that is the litigation process, and is described to them privately and independently by their counsel and each player chooses their strategy independently. The description of the structure of the game should not focus expectations on the outcomes, as the

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8 Crawford and Haller (1990), Learning How to Cooperate: Optimal Play in Repeated Coordination Games, Econometrica, Vol 58, No 3, 571-595
specific outcomes are unknown. Each player must consider the opponent’s action when choosing his own action.

After an event that has caused damages has occurred, the potential plaintiff has a choice whether or not to pursue the claim. He will litigate with a certain probability of $p$ and not litigate with a probability of $1-p$. These probabilities can only be determined once the entire model can be run. Looking at all the probabilities of the other decision points in the game, backward induction can be used to determine the initial probability. The initial assumption will be that the litigants are cooperative, and once the model is stable, the model will be run again, with a recalcitrant defendant.

There are a number of factors involved in this decision, with each one having the ability to alter the probability. If the plaintiff chooses not to litigate, the process stops and this is a terminal node in the game. If the plaintiff decides to pursue the claim, he will then incur a cost to collect information, seek legal counsel and issue a summons to the defendant.

A plaintiff who has suffered damages has a choice between retaining counsel on a fee basis, which is a high investment, or on a contingency basis, which is a much lower investment. In South Africa, the larger, more prominent law firms do not take clients on a contingency basis and are also very selective about the cases they pursue, as they need to ensure client satisfaction so that their fees will be settled. The smaller firms will take clients on a contingency basis where they believe the case can be won. Many personal injury claims are pursued on a no win, no fee basis.

2.6 Dispute Resolution and Conflict Management in Engineering Management

In engineering projects, disputes often arise, which are settled without litigation. Litigation is costly and time consuming, leaving both parties unsatisfied with the outcome and imposing an additional delay on the project. This is why there is often a clause in contracts that disputes will be settled through arbitration or mediation. Arbitration and mediation is often included in contracts as a way to prevent litigation. There are benefits, especially to larger companies, over litigation.

In South Africa, the cost of arbitration may be the same to litigate, however, arbitration is a speedier process which will prevent spill over costs caused by lengthy litigation procedures. The court roll is over two years long, and then the case must still be presented. In that time, evidence will have deteriorated and expert evidence will have to be lead in order for the judge or magistrate to understand the case at hand. All of this is avoided in mediation or arbitration. The company can start negotiations immediately, and the arbitrator is often an expert in the field and will have an understanding of the problem at hand without having to lead expert evidence.
Engineering disputes have additional factors to consider when deciding whether to pursue a claim. An engineering company will often not litigate against their client because of the prospect of future business ventures. In South Africa, Murry and Roberts Holdings (Ltd) have had a long standing implicit business relationship with Eskom to construct power stations. If Eskom were to pay late, Murry and Roberts Holdings (Ltd) must consider if it is in the best interest of the future business relationship to take the matter to litigation. It will risk many future endeavours. This is in contrast with the situation between Bombella and Gauteng Management Agency, The Bombella Consortium was aware that the Gautrian construction was a once off project and there would be no future endeavours for the parties, therefore they presumably decided to pursue litigation.

Another important factor is privacy of the parties involved. Litigation is a matter of public record and the parties involved have much of their private information being made public. This can be a factor for or against litigation. In the case of Murry and Roberts Holdings (Ltd) and Eskom, litigation would be avoided between a public company and a government institution, both parties have resources at their disposal to pursue and draw out litigation, which would damage the reputations of all involved and reduce the probability of future projects being undertaken together. In the case of Bombella, they were a listed company and their shareholders were losing confidence in their ability to improve their financial situation after the construction of the Gautrian, this caused them to pursue litigation to try win back shareholder confidence.

It is important to note that even if litigation is pursued, at any time before trial, an offer can be accepted and the case will not go to trial. In disputes between large corporates, often litigation can be pursued, but the case does not make it to trial in an effort to settle early and keep the company out of the public eye. This is why the focus will be on the offer to settle in the litigation procedure.

Edkyns and Smyth (2006) performed a case study in the United Kingdom to determine how legal factors determine performance outcomes in Public-Private Partnerships. They looked at contractual and human behaviour as opposing methods of managing project uncertainty and risk.

They made use of case based data, which is affected by political sensitivity in the public domain, the sensitivity of relationships in private organisations and confidentiality between individuals. They used trust as an indicator of relationship development. They focused on the differences between rational and legal contracting. In the case of construction projects, there is a client driven agenda to improve performance, cost and value, this is seen as rational contracting. Legal contracting is guided by the letter and spirit of the contract. There are formal and informal procedures which are followed, which may not be part of the contractual terms. The terms in the contract provide guidance for resolution, if no resolution is found in the contract, litigation will follow.

Once a contract has reached a point where it must be referred to litigation, an extra cost is incurred. It may induce behaviour where service providers and clients become concerned with
meeting certain criteria, rather than focusing on the real reason the contract was set up. Such behaviour will ultimately lead to a breakdown in trust, and therefore a breakdown in the relationship between the client and the contractor.

Most disputes can be resolved without incurring expensive transactional costs involved in litigation, however the breakdown of the relationship will often erode the means by which the parties will ultimately be able to reach a solution. If the relationship of the parties was still intact, the dispute would often be solved by an arbitrator, however in the United Kingdom, the legal profession earns more fees from the contracting sector, than any other sector.

From the outset of a construction project, there are many uncertainties. Under Public-Private Partnerships, detailed decisions are paid for by the design and build team from the design and development budget. These projects are long term in nature, which means that parties must be able to maintain a harmonious relationship as the companies will have to work together for long periods of time. The existence of uncertainty implies that trust is needed so that reasonable solutions can be identified at the right time.

In the case study done by Edkyns and Smyth (2006) they focused on two cases, A and B. both were politically sensitive, however B was seen to be more sensitive in the short term. Case A made use of a Special Purpose Vehicle, so that the parties working together on the contract would be aware of the long term contractual implication. Both rational and legal factors were analyse when there were recommended changes to the project. In case A, the behaviour of the parties tended to be rational, due to the understanding of the long term nature of the project.

However in case B, there was less understanding and concern for relationship effectiveness over the project as there was shorter contract duration. When there were changes made to the project, the parties had to rely on past experiences to inform their actions. This resulted in the behaviour tending towards legal reactions, which lead to defensiveness among parties as well as an increase in information asymmetry. However, Case B had higher levels of trust than Case A due to the fragility of the relationship, which was dependant on many outside factors. Overall, the study concluded that Case A projects perform better over time than Case B.
3. A Model of Litigation

In this chapter the model of the litigation game for the South African based litigation process will be introduced and explained.

3.1 The Model

Figure 1: Conceptual model of the civil litigation process
The conceptual model shown in Fig. 1 describes the entire litigation process as it can occur in South Africa. The decision whether to litigate will be analysed using game theory, specifically a signalling game where there are two players (plaintiff and defendant) and nature that determines the initial event that leads to the litigation but is itself not a player was investigated by Torres [24]. As indicated in the figure there is a concave relationship between the value of the claim and the number of claims. As the value of the claim increases, the absolute number of claims tends to zero due to the probability associated with such extremely large damages. However, this number never quite reaches zero as the rise of class action law suits with massive damages proves. The initial event will convert the game of incomplete information to one of imperfect information.

After an event that has caused damages, the potential plaintiff has a choice whether or not to pursue the claim, some claims are not pursued but he must choose to litigate with a probability of p or not litigate with a probability of 1-p. Considering all the probabilities of the decision points in the game, backward induction can be used to determine the initial probability involved in the decision of whether a plaintiff will institute an action. Various factors that influence the decision of a rational plaintiff include

- the probability of success of the case,
- the time cost,
- monetary cost, and the economic cost.

Once the action is instituted, the onus falls onto the defendant to decide whether or not to defend the litigation. The defendant will consider the strength of the plaintiff’s case, the strength of his own case as well as the possibility of an apportionment of the damages. Once he has assessed the situation, he can choose between

- defending the matter,
- settling with the plaintiff, or
- letting the court make a summary judgment.

There are a number of factors involved in this decision by the defendant, with each factor affecting the probability of selecting that strategy. If the plaintiff chooses not to litigate, the process stops and this is a terminal node in the game with a payoff of P6. If the plaintiff decides to pursue the claim, he will then incur the cost of c1 to collect information, seek legal counsel, deliver a letter of demand on the defendant and if the defendant does not respond to this demand, he will then issue summons to the defendant.

The plaintiff must then choose between retaining counsel on a fee basis, which is a large investment, or on a contingency basis, which is a much lower investment. In South Africa, the larger law firms do not take clients on a contingency basis and are also very select about the cases that they pursue, as they need to ensure client satisfaction so that their fees will be settled.
Smaller firms will take clients on a contingency basis where they believe the case can be won or not. Many personal injury claims are pursued on a no win, no fee basis.

Using these signals, the defendant makes an offer, and the likelihood of the plaintiff accepting the offer must be determined. This is dependent on the stage in the litigation process, as well as the merits of the claim. If the plaintiff is able to signal how strong his case is, the defendant’s offer will be close to an amount that the plaintiff will be willing to settle for. There is no clear answer to when a plaintiff will settle and when they will sue, therefore, they will have certain degree of membership to a specific solution and fuzzy set theory will be needed to analyse the range of possible solutions.

Both types of defendant, the factitious and the genuine, are aware of the constraints of their case, however, these constraints only affect the strategy used to play the game. The genuine plaintiff must send signals and because of his sincerity, he will see to it that he is compensated fully. The factitious plaintiff will only send spurious signals to reduce the cost of signalling in the hopes of a settlement offer. However, if the defendant knows that the plaintiff has no case and still wants to go to trial, he will request the plaintiff to put up security for the costs of the matter. The payoffs may vary because a defendant may or may not be able to distinguish a factitious plaintiff from a genuine one.

Applying this to a signalling game, the cost of signalling increases in both the genuine as well as the frivolous plaintiff’s cases, however, the cost to the frivolous plaintiff increases by a greater amount given the poor merits of the case. The overall cost of the trial increases because, the more the defendant discovers the case lacks merits, the more relevant it becomes in proving the defendant’s case.

In the conceptual model, the offer to settle appears just before the trial stage, as that is the stage where the defendant has the most information about the plaintiff’s case. However, in reality, an offer to settle can be made at any point, and the defendant can make numerous offers to the plaintiff before the trial date. At each stage of the pre-trial process, the costs to each party will increase, and therefore, as each stage passes, the plaintiff will increase the amount at which he will be willing to settle.

In the model the confidence that a party vests in their case is a signal of the merits of their case. According to de la Rosa [6], an overconfident agent can overestimate the probability of success and thus in our model this would result in an overestimate of the offer – but this affects both the plaintiff and the defendant.

Asymmetric information affects all the signals in the game. A plaintiff with low damages may mimic a plaintiff with higher damages in the hope of a higher settlement. This incentive is often known by a defendant. If a plaintiff has a strong case, he will invest in the trial preparation regardless of the asymmetry. The difference is clearer when the plaintiff’s case is weak, where the information is asymmetric, the plaintiff becomes indifferent, as he knows, and if he invests the settlement will be higher than if he does not. If the case is strong, the plaintiff will not settle and if it is weak, the plaintiff accepts the settlement as “informational rent”.


A factitious player will open with a chance move in accordance with a probability distribution that is common knowledge. Nature will also randomly choose the type of player. The defendant as the second mover must now decide if the plaintiff has some sort of hidden agenda that will affect the settlement offer. The defendant can look at past behaviours of the type of plaintiff:

- Previous opportunistic behaviours from that party
- Whether the party is a firm or an individual
- The investment that the party has made in the case

From that information, he can choose a probability based on the percentage of interest of the party. For example in a specific type of claim where a person slips and falls in a shopping centre, the defendant is unsure of the true nature of the plaintiff’s injuries. He may decide that 40% of those claims are genuine and the rest are opportunistic. Once he has decided on the probability of the type of plaintiff, he will either invest and make a high settlement offer, or make a low offer and wait.

The plaintiff also has perfect knowledge of his claim; however, the defendant only knows the probabilities of the damage the plaintiff suffered. The plaintiff sends certain signals, in his documentation, the nature of the plaintiff as well as the law firm that the plaintiff selects. The defendant, who has to make a decision about the merits of the plaintiff’s case, then interprets these signals. If the defendant has a good knowledge of the plaintiff’s case and the merits are strong, it will benefit him to settle the matter, as the longer he progresses, the more costly it becomes. Once the defendant has made an offer based on the signals, the plaintiff must decide whether or not to accept it.

The game will be constructed, starting from a simple perfect information game, to a more complex, more realistic imperfect information signalling game. An example of a situation will be constructed where one party, the plaintiff will institute an action against the defendant. There is no question regarding liability on the part of the injurer, nor is there a question regarding the physical damages suffered, however, the injured party is claiming compensation beyond the costs of the physical injuries to compensate her for her pain and suffering.

After constructing a game tree, it is possible to see how the players will combine their different actions into specific strategies. Then, in order to get the solution of the game, it must be converted into the game theoretic matrix form.

There are three methods commonly used to isolate a single solution to a perfect information game. Firstly, rational moves with strictly dominant strategies, where the rational strategy of the players will eliminate irrational strategies automatically. Secondly, [21] define a Nash equilibrium as a strategy profile with the property that given the strategies of all other players, no player can do strictly better by unilaterally choosing a different strategy than he has. Thus the strategy chosen becomes the best response to the strategies of others. If there was no Nash equilibrium, one player could unilaterally do better by altering his move. Finally, incredible threats and sub-game perfection must be considered. Harsanyi and Selten [10] refined Nash’s theory, where each player’s conduct forms a Nash equilibrium, not only for the whole game,
but for each sub-game too, this rules out games that rest on incredible threats. An incredible threat calls for conduct that does not induce a Nash equilibrium in some sub-game, such conduct is not rational and therefore it is not considered a threat. This theory eliminates plausible elements from a set of equilibria. Sub-game perfection eliminates all but a single unique solution.

When imperfect information is introduced into the game, it limits the sub-game perfection. Imperfect information is a situation where at least one player must make at least one move without having observed what some other player has done. This takes place where there is an offer made by the defendant that has some level of uncertainty. This produces new Nash equilibriums which cannot be excluded using perfect sub-game equilibrium. Therefore, there is no prediction for the choice if a partial offer is made. This results in a game with multiple equilibria, where none of them are inherently implausible or superior to any other.

In the imperfect information game, regardless of which partial offer is made, the plaintiff will still always do better to settle, so she will act rationally when she receives a partial offer. The refinement of this type of game uses a Bayesian equilibrium which will rule out solutions involving irrational conduct by the plaintiff at the partial information set and will produce a unique solution to the game, but matters are not always as simple as the game constructed to explain the theory. In Bayesian equilibrium, nature is introduced as a player that assigns variables and probabilities to the players, depending on the player’s type. This allows for incomplete information to become imperfect information. The type of player determines they player’s payoff function, and in a Bayesian game, the incompleteness of the information means that at least one player is unsure of the other’s type.

Applying this to the offer and settlement game, the nature of the parties will affect the payoffs and the probabilities of the game. The nature of the parties can be seen from the types of signals that they send.

If a dispute or interpretive question arises, a plaintiff has a choice whether or not to litigate. This choice involves the weighing up of factors such as the nature of the parties involved and the amount in dispute. When a prospective plaintiff takes into account all the costs involved, they often choose to take a loss and are left in an undesirable situation where there has been an inequitable distribution of income. All people have a right to a fair trial, but in South African civil law, there is no standard set for a fair trial, which results in frivolous lawsuits and inequitable income distributions.

Research has determined the efficiency of specific laws as well as legal systems as a whole, but not the efficiency of the civil litigation process as a remedy. Taking the entire civil litigation process in the presented conceptual model into account it is clear that modeling the parties’ strategies surrounding the offer to settle are central to the question of whether the civil litigation process is economically efficient.

Future work will involve collecting survey data with which to calibrate certain parts of the model so that numerical predictions can be made about the relevant probabilities that are essential to understanding the litigation process as a whole.
We should conclude by remarking on the applicability of the process to other legal litigation or processes that may require decision making based on economic motivations that can be modelled using various game theoretic processes.

Due to the cost, both economic and time cost, parties who deserve a remedy do not approach the courts and often parties who should not litigate clog up the system. If a person feels entitled to damages, they may institute an action as a bluff in order to induce some type of settlement from the defendant. If the settlement offer is not satisfactory, the parties will go to trial where neither party had an intention to litigate.

Analysis of law and economics has focused on the trial procedure and the decision between litigation and settlement. Theory states that litigation is always preferable over settlement when the plaintiff has a strong case, however, parties will try avoid trial at any cost, so if a plaintiff is offered a settlement above his bottom line before the trial date, he will accept, no matter how strong the case. This analysis will focus specifically on the pre-trial processes from the point of view of the plaintiff in order to determine where the process slows down and how factitious plaintiffs pass through the system.

As this research focuses on the entire process as a whole, rather than a situation between specific parties, this game will be played a repeated game where the parties are able to take previous decisions into account when deciding to litigate. The decision points will be plotted on a binomial tree where at each node, the expected return of litigation changes due to the additional investment made by the plaintiff in his case. The asset is his claim and the strike price is the plaintiff’s bottom line. The life of this option will continue until the offer made by the defendant exceeds the strike price, and at that point, the plaintiff will exercise that option and the parties will settle out of court.

Other possible actions include the firm chosen, the use of experts, initially choosing to file a suit or finally deciding to take the case to court, should negotiations fail. P will assume that the expected value of the trial is positive, thereby making a credible threat to D during negotiation.

In general, the strategy of the players is a complete list of actions to be taken at each of the player’s decision opportunities and depends on, the observable actions taken by the other player in the past, the actions taken by the player himself in the past, the information that the player currently possesses and any exogenous relevant actions that have occurred that the player is aware of. An example of this is speculations regarding an award, for example from a personal injuries tariff in the law of delict.

There are times where being predictable is useful, but there are also times where unpredictability is useful. If P knows the actual damages that D is liable for, but D only knows a possible range of damages, then if D makes a decision never to go to court, it will encourage P to make higher claims. Alternatively if D makes a decision to always go to court, no matter what P is willing to settle for, it will end up being overly costly to D. A Mixed strategy can be used to try to solve this problem.
There are three phases in the litigation process, the pleadings phase, preparation for trial and the trial itself. In each phase, the parties are faced with various decisions. Once a plaintiff has decided to institute action, he issues a summons which is delivered to the defendant. The defendant will either, offer to settle or defend the action by sending a notice of intention to defend and a plea. If the defendant decides not to defend the action, he will have summary judgement granted against him. The defendant may defend the action without merits, if the defence is not \emph{bona fide}, the plaintiff will apply for exception, on the grounds that the case lacks merit.

Assuming the case is defended, the plaintiff uses the defendant’s signal to decide on his next move. If the plaintiff’s case is one based on a liquidated amount, he will apply for summary judgement, if not; he will draft a replication to the defendant’s plea. After all the pleadings have been exchanged, pleadings are closed and no further notices pass between the parties, unless there has been an irregular step.

Once pleadings have closed, the parties will start to prepare for trial. The plaintiff will set the matter down on the court roll and brief counsel. In this stage, witnesses are subpoenaed and consulted. Discovery notices are sent to compel discovery of outstanding documents. In the preparation for trial, the parties find out more information about the opponent’s case and the defendant is able to make a more precise offer to prevent the case going to trial.

Nature determines a situation $x_i$. This event affects a potential plaintiff as it causes one party to suffer damages through the fault of another. The plaintiff makes a decision whether or not to claim these damages. This decision is made using prior information from, history, anecdotal information or the beliefs of an expert litigant as could be anecdotally captured in Figure 2. In nature, there is a range of events that can occur, which could all give rise to damages. There is a concave relationship between the value of the claim and the number of claims that are pursued. As the value of the claim increases, the number of claims tends to zero, because as the number gets infinitely larger, there are less occurrences of events with such a great amount of damage. However, this number never reaches zero, with the rise of class action law suits, there can be cases that are worth billions.

![Figure 2: Relationship between the value of a claim and the claims pursued](image)

An example of an event is a prospective plaintiff who has suffered personal injury in the workplace, he makes his decision based on the history of claims that have been settled by his employer in relation to personal injury, anecdotal information from other collages and once he
decides to litigate, he will seek the counsel of an expert litigator. The litigator will derive his knowledge from past cases, $\Sigma$ payoffs to litigants. In South Africa, personal injuries claims are based on a tariff, this will guarantee a potential plaintiff a specific amount based on the extent of the injury.

Due to the nature of the legal system and the reliance that a plaintiff has on past cases, the game will be a repeated game, rather than a series of single games. This model focuses on the entire civil system, rather than a case between two parties. In a repeated game, there is an amount of common knowledge and a particular equilibrium is expected to govern play. This type of game relaxes the assumption of fully rational behaviour and focuses on the adaptive process by which players learn from the history of play. An optimal strategy is one that maximises expected payoffs, given prior payoffs.

In the litigation game, previous payoffs are given in case law as well as tariffs, the structure of the game is common knowledge that is the litigation process, and is described to them privately and independently by their counsel and each player chooses their strategy independently. The description of the structure of the game should not focus expectations on the outcomes, as the specific outcomes are unknown. Each player must consider the opponent’s action when choosing his own action.

After an event that has caused damages has occurred, the potential plaintiff has a choice whether or not to pursue the claim. He will litigate with a probability of $p$ and not litigate with a probability of $1-p$. These probabilities can only be determined once the entire model can be run. Looking at all the probabilities of the other decision points in the game, backward induction can be used to determine the initial probability. The initial assumption will be that the litigants are cooperative, and once the model is stable, the model will be run again, with a recalcitrant defendant.

There are a number of factors involved in this decision, with each one having the ability to alter the probability. If the plaintiff chooses not to litigate, the process stops and this is a terminal node in the game with a payoff of $P_6$. If the plaintiff decides to pursue the claim, he will then incur the cost of $c_1$ to collect information, seek legal counsel and issue a summons to the defendant.

A plaintiff who has suffered damages has a choice between retaining counsel on a fee basis, which is a high investment, or on a contingency basis, which is a much lower investment. In South Africa, the larger, more prominent law firms do not take clients on a contingency basis and are also very select about the cases that they pursue, as they need to ensure client satisfaction so that their fees will be settled. The smaller firms will take clients on a contingency basis where they believe the case can be won. Many personal injury claims are pursued on a no win, no fee basis.

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9 Crawford and Haller (1990), *Learning How to Cooperate: Optimal Play in Repeated Coordination Games*, Econometrica, Vol 58, No 3, 571-595
The decision by a client to litigate can be seen as a probabilistic investment decision where the litigation decision will be compared to a call on a stock option and can be illustrated in a binomial tree as shown in Figure 3.

In the basic binomial tree as developed by, the option exists for time T, it can increase in value from \( S_0 \) to \( S_{ou} \), where \( u > 1 \), or down to \( S_{od} \), where \( d < 1 \). Therefore, the percentage increase is \( u-1 \) and decrease would be \( 1-d \). The parameters \( u \) and \( d \) match the volatility of the stock price. Where \( u = e^{\sigma \sqrt{\Delta t}} \) and \( d = e^{-\sigma \sqrt{\Delta t}} \)

According to portfolio theory, an investor should hold \( \Delta \) in shares and one option. \( \Delta \) is the amount that produces a riskless portfolio. Therefore, if the price increases, \( S_{ou} \Delta -fu \) and \( S_{od} \Delta -fd \). Therefore, \( \Delta = fu-fd/S_{ou}-S_{od} \). This \( \Delta \) represents the change in the option price to the change in the strike price time progresses.

If the choice to litigate is seen as a call option, nature determines incident \( x_i \), which causes the potential plaintiff to incur damage in the amount \( S_o \), then \( f \) is the amount paid to a litigator, if the plaintiff decides to litigate; he will claim \( S_{ou} \) and \( fu \) will equal the cost of the trial. If the plaintiff decides not to claim, the loss is equal to \( S_{od} \) and \( fd \) is equal to zero. From \( S_{ou} \), the plaintiff chooses how much to invest in the case, high being an investment on a fee basis and low being on a contingency basis.

In order to make the decision, the claim is discounted to the present value, \( (S_{ou} \Delta -fu)e^{-rt} \). The cost of the suit is \( S_o \Delta -f \), so \( S_o \Delta -f = (S_{ou} \Delta -fu)e^{-rt} \). Therefore,

\[
f = S_o \Delta (1-ue^{-rt}) + fu e^{-rt}.
\]

If you let \( p = e^{rt} - d / u - d \), then \( f = e^{-rt} [pfu + (1-p)fd] \)
This stage does not involve probabilities, it is a mere valuation of the terms, and it is assumed that probabilities are incorporated into the stock price. To determine the expected return, it is assumed that \( p \) is the probability of litigation and \( (1-p) \) the probability of not litigating.

\[
\begin{align*}
(7) & \quad \epsilon(S_T) = pS_{ou} + (1-p)S_{od} \\
(8) & \quad \epsilon(S_T) = pS_o (u-d) + S_o
\end{align*}
\]

When you substitute \( p \)

\[
\epsilon(S_T) = S_o e^{rt}
\]

When the plaintiff makes the decision to litigate, \( \Delta t \) extends time \( T \), therefore,

\[
fe^{r\Delta t} \left[ pf_u + (1-p) f_d \right] \quad \text{and} \quad \frac{e^{r\Delta t} - d}{u - d}
\]

\[
(9) \quad f = e^{-r\Delta t} \left[ p^2 f_{uu} + 2p(1-p)f_{ud} \right]
\]

Where \( p^2 \) and \( 2p(1-p) \) are the probabilities that the final nodes will be reached. The option price is equal to the expected payoff in a risk neutral world, discounted by the risk free interest rate. In other words, the price paid for representation, \( f \), is equal to the expected payoff, \( f_{uu} \), and the plaintiff is in possession of \( S_{ou} \), the underlying.

Once the plaintiff has made an investment, it is not clear on the actual amount invested by the plaintiff, but the choice of law firm can indicate what type of investment has been made. Larger firms do not take clients on a contingency basis, so if the plaintiff has mandated an attorney
from a larger firm, it can be assumed that he is investing on a fees basis. This will assist the
defendant in assessing the severity of the matter. If the plaintiff’s investments are to bluff the
defendant into a settlement offer, it is unlikely that he will make a sizable investment as there
is a risk that the defendant will take exception to his pleadings.

Once the plaintiff has chosen to litigate, the game moves into a signalling event where certain
information will be made public and other information will be kept private. Based on the
information available to the defendant he is able to make an offer. If the offer is accepted by
the plaintiff at any time, the game stops and does not go to trial. The most common point in
this process where an offer is accepted is after discovery, but before trial. This is where the
most information has been made available to the defendant and he can more accurately assess
the plaintiff’s bottom line which he will accept and will make a more accurate offer and the
parties will not go to trial if the defendant’s calculations are correct.

When comparing litigation to a call option, \( S_0 \) is the asset, the asset is the value of the plaintiff’s
claim, both patrimonial as well as non-patrimonial loss. The strike price, \( K \), is the lowest offer
that a plaintiff is willing to accept from a defendant. The strike price changes at each node of
the tree as, as the game progresses, more costs are incurred by the plaintiff and the amount
which he is willing to settle at will increase. \( S_o \) will also change through the play as the amount
of sunk costs incurred increase. These sunk costs are taken into account when calculating \( \sigma \),
the risk. The call will therefore be exercised where \( S_o > K \). Therefore the value of the option =
max \([K - S_o, \sigma]\).

Discovery is the final stage in the pre-trial process and probably the most strategic part of the
pre-trial process. It is the second signalling event where information becomes public at a sunk
cost of \( c_2 \). Discovery takes place over an indeterminate time and as time tends to \( \infty \) the value
of the claim decreases. This allows for a recalcitrant defendant to prolong the discovery process
as long as possible, so that a lower offer becomes more attractive as the expected value of the
plaintiff’s claim decreases. The first signal depends on full or partial discovery as it will reveal
the type of plaintiff. In any case discovery is costly and litigants have incentive to settle before
discovery costs are sunk.

### 3.1.1 Information

The outcome of the game is determined by nature, the court processes in the South African
High Courts. The plaintiff is aware of all the possible outcomes, but is unsure of the overall
result. The law will provide certain filters, such as default judgement, summary judgement and
requests for security for costs, which will deter certain actions from going to trial.

The plaintiff will only gain utility if he decides to go to trail where the probability of winning
is \( p(x) \) and the probability of losing is \( 1-p(x) \). These probabilities are updated based on the success
of the signals and the strength of the case.
The plaintiff must make the last move, deciding whether to go to trial. A winning case gives a utility of $(I)$ and a losing case gives a utility of $(0)$. This is subtracted from the cost of involving attorneys, $C_a$, and if the plaintiff decides not to act, the cost of not acting, $C_{na}$.

$$U_p = \begin{cases} 
1 - C_a & \text{if the case is fought and won} \\
0 - C_a & \text{if the case is fought and lost} \\
0 - C_{na} & \text{if the plaintiff does not act} 
\end{cases}$$

Where, $1 - C_a > 0 > -C_{na} > -C_a$

The plaintiff gains utility from a winning or losing case. The amount of utility is dependent on the strength of the case. A strong case is $a_s$ and a weak case is $a_w$. When a plaintiff decides not to sue, there is no utility and he suffers a signalling cost of $C(S)$.

$$U_{\text{case}} = \begin{cases} 
a_s - C(S) & \text{if the plaintiff sues and wins} \\
0 - C_{na} & \text{if the plaintiff does not sue} 
\end{cases}$$

Where, $a_s > a_w > 0$

Both $a_s$ and $a_w$ increase as the case moves through the stages of the justice process.

The game’s outcome can be affected by many different factors, such as, the nature of the parties, the expectations of the parties as well as the investment a plaintiff makes in his case. All these factors arise due to imperfect information between the parties. In the pre-trial process, neither party is aware of the other’s case until discovery is made after the close of pleadings.

### 3.1.2 Focus on Offer and Settlement

Rational parties will most likely settle, if the offer is properly valued. Trial is costly and time consuming and if the plaintiff receives compensation without having to go to trial, it is a win-win situation. In order for the plaintiff to accept the settlement offer, both parties must have mutual incentives to settle out of court. This will shorten the dispute as well as keep it confidential.

Incentives to settle are modified where litigants are given the opportunity to enhance their case by investing in preparation during the pre-trial phase. Rhee (2005) argued that investment could affect the incentives to settle in a sequential game. It is assumed that informed parties, the plaintiff, decide first whether to invest in case preparations. Then the defendant, as the uninformed party, offers a “take-it-or-leave-it” settlement.

This case preparation raises the value of a claim, but also involves a sunk cost, which can be used by the plaintiff to manipulate the other side by influencing their beliefs and incentives to settle. The parties do not know what the other side has invested, but the choice of counsel is
usually a good indicator. A more prominent firm with a good reputation indicates a significant investment.

Law firms tailor their services towards plaintiffs who seek large damages. If the case preparation exceeds the return, no rational plaintiff would proceed to claim.

3.1.2.1 Asymmetric Information

A plaintiff with low damages may mimic a plaintiff with higher damages in the hope of a higher settlement. This incentive is often known by a defendant. If a plaintiff has a strong case, the will invest in the trial preparation regardless of the asymmetry. The difference is clearer when the plaintiff’s case is weak, where the information is asymmetric, the plaintiff becomes indifferent, as he knows, and if he invests the settlement will be higher than if he does not. If the case is strong, the plaintiff will not settle and if it is weak, the plaintiff accepts the settlement as “informational rent”.

This can result in parties litigating where neither an intention to go to trial has. If the plaintiff were to bluff and a settlement offer is so low that it does not even cover the preparation costs, the parties land up going to trial. Thus, the probability of a trial decreases as the strength of the case decreases.

The game will be constructed, starting from a simple perfect information game, to a more complex, more realistic imperfect information signalling game. The same example of a person slipping and falling in a shopping centre will be used throughout. The person, V has suffered substantial damage, as well as emotional damage from the embarrassment suffered because of this fall. There is no question regarding liability on the part of the shopping centre, nor is there a question regarding the physical damages suffered, however, V is claiming compensation beyond the costs of the physical injuries to compensate her for her pain and suffering. The centre’s legal advisor, L is reluctant to litigate, as the evidence that V could present would be in her favour.

Suppose the medical bills amount to R700 000, pain and suffering in the amount of R600 000 and if V chooses to litigate, each of them will incur costs of R400 000 (for the sake of convenience, the numbers will be referred to as 4, 6 and 7). How will the parties proceed?

Suppose L makes one of two offers,

(i) Full compensation of 13, F, or
(ii) Partial compensation of 10, P

V chooses to either settle or go to court

Player L has a single move with a choice of two solutions, while player V has two moves depending on the offer, settle or go to court.
Figure 5: Moves of players L and V in litigation

From the game tree, it is possible to see how the players will combine their different actions into specific strategies. For L, he has one move where he may choose either F or P. For V, the strategy depends on how L will play, so it must prescribe a choice for every move. This gives rise to two situations where V may act, therefore, four combinations, (c,s'), (c,s), (c',s) and (c',s'). In a game where there are a finite number of players, there are a finite number of strategies. If the strategy of (c,s') was chosen, V will take a partial offer to court and settle on a full offer, [F(c,s')], which leads to the unique solution of (-13,13). In this game, there are no choice moves and each sub-game leads to a terminal node.

In order to get the solution of the game, it must be converted into matrix form;

<table>
<thead>
<tr>
<th>Player V's Strategy</th>
<th>(s,s')</th>
<th>(s,c')</th>
<th>(c,s')</th>
<th>(c,c')</th>
</tr>
</thead>
<tbody>
<tr>
<td>P</td>
<td>-10,10</td>
<td>-10,10</td>
<td>-17,9</td>
<td>-17,9</td>
</tr>
<tr>
<td>F</td>
<td>-13,13</td>
<td>-17,9</td>
<td>-13,13</td>
<td>-17,9</td>
</tr>
</tbody>
</table>

Table 5: Strategy of Players in the Litigation game

This game is not subjected to uncertainty, and therefore there is a level of common knowledge that is known to the players. Where there is no uncertainty surrounding the nature of the players and the payoffs, the game is said to be complete. Each player, at each move knows everything that has happened previously in the game, there is perfect information.

There are three methods I will use to isolate a singular solution in this game, rational plays with strictly dominant strategies, Nash equilibrium and incredible threats and sub-game perfection.
• **Rational Players with Strictly Dominant Strategies**

This game contains certain strategies that a rational player would never usually play. Looking at V’s strategy of \((c,c')\), the rules of the game are so that V always wins, but when she goes to court, she must incur legal fees and her payoff is 9, compared to \((s,s')\) where her payoff is 10 or 13, depending on L’s offer of F or P. Irrespective of what L offers, it is always better to settle than to go to court, therefore \((c,c')\) is strictly dominated by \((s,s')\) and L can eliminate \((c,c')\) as a strategy. In some cases, each player may have a strictly dominant strategy.

• **Nash Equilibrium**

The cell marked * corresponds to the strategy of \([P (s,s')]\), where L offers partial compensation and V’s strategy is to settle either way. When you fix V’s strategy at \((s,s')\) and ask if L can do any better, he cannot. Now if you fix L’s strategy at P, V can also do no better than \((s,s')\). At the other decision points, she will incur a cost of 4 for legal fees, therefore gets an overall payoff of 9, even less than the partial offer, therefore, given L’s choice of P, V will choose to settle, and when V chooses to settle, L’s best option is P, this amounts to a Nash equilibrium.

Salant and Sims (1996) define a Nash as a strategy profile with the property, given the strategies of all other players, no player can do strictly better by unilaterally choosing a different strategy than he has. So that the strategy chosen becomes the best response to the strategies of others. If there was no Nash, one player could unilaterally do better by altering his move. There is at least one Nash in every finite non-competitive game, in this specific game, there are 3, \([P (s,c')]\), \([P (s,s')]\), and \([F (c,s')]\).

In this game, the presence of three Nash equilibrium solutions ruled out 5 of the 8 strategies, whereas the dominance theory only ruled out 2. The Nash implies that the dispute will always be settled, but offers no prediction of whether F or P will be paid. In order to determine this, the solution must be taken a step further.

• **Incredible Threats and Sub-game Perfection**

Reinhart Selten (1988) refined Nash’s theory, where each player’s conduct forms a Nash equilibrium, not only for the whole game, but for each sub-game too, this rules out games that rest on incredible threats. What is it that defines an incredible threat? When you begin at the choice node of a sub-game, the sub-game has certain strategic probabilities, which are the same as each other sub-game, therefore, every sub-game postulates the same assumption of rationality. Therefore, the strategy in each sub-game is that the player should react with his best response. An incredible threat calls for conduct that does not induce a Nash in some sub-game, such conduct is not rational and therefore it is considered a threat, if it is carried out, it is not the player’s best response.
This theory eliminates plausible elements from a set of equalibria. Sub-game perfection eliminates all but as single unique solution. In two of the three Nash solutions, marked * and **, V’s strategy is to settle when L offers P and it is L’s strategy to offer P. given V’s strategy of settling for P, V does best to settle since going to court will eat away at any additional compensation. It is the third Nash equilibrium, *** that displays a threat. Here, V threatens to go to court where L offers P and L responds by offering F to avoid a legal battle. Given that strategy choice by L, V does well to threaten litigation.

The problem here is that V’s threat is not credible. This threat is off the equilibrium path. She threatens to litigate a partial offer so that L will offer full compensation, so in [F (c,s‘)] V is never called upon to carry out the threat. If V receives an offer of P, it is not in her best interests to carry out the treat as the payoff is now reduced by 4. Assuming that V is rational, she would not carry out this threat, and this is clear to L.

In this game, the sequences of moves that follow L’s choice of P form a sub-game. Sub-game perfection requires that in both the sub-game and the entire game, V chooses her best response which is to settle, therefore the Nash of the original game, where V’s strategy is (c,s), is not a Nash, the same is true of [P (s,c‘)]**. In contrast with * where V’s strategy is to settle for P and for L to offer P, which is a Nash in the sub-game and in the game as a whole. This proves that every game where there is perfect information has one unique solution.

<table>
<thead>
<tr>
<th>Defendant</th>
<th>Plaintiff</th>
<th>Accept</th>
<th>Reject</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low offer</td>
<td>-L, L</td>
<td>Ω, Ω</td>
<td></td>
</tr>
<tr>
<td>High offer</td>
<td>-H, H</td>
<td>E(T), E(T)</td>
<td></td>
</tr>
</tbody>
</table>

Table 6: Prisoner’s Dilemma of an Offer and Acceptance

This represents the offer and settlement. The defendant either makes a high offer or a low offer and the plaintiff either accepts the offer or rejects it. When the defendant makes a low offer and the plaintiff accepts it, the defendant pays the plaintiff L, therefore the defendant’s payoff is –L and the plaintiff’s payoff is L. Where the defendant makes a high offer and the plaintiff accepts it, the defendant will pay the plaintiff –H and the plaintiff will gain H.

The game gets more complicated where the plaintiff rejects the offer. When the plaintiff rejects a low offer, both parties gain information about the case. The defendant knows that the plaintiff is expecting more from a trial and he is afforded another opportunity to make a higher offer, and the plaintiff gains information about how the defendant perceives the case. The plaintiff can assume that the defendant sees the case as being weaker than what the plaintiff initially thought. Either the plaintiff can give the defendant more information, showing him that he is positive that he will succeed on the merits and request a higher offer, or the plaintiff may realise that the defendant may have a valid defence and his case may have some weak points.
If the defendant makes a high offer and it is rejected, the payoffs for each are the expected values that the parties foresee after the trial. These values are different for the two parties. The expected value for the defendant is $E(T)\mid_{0H+c}$, where $c$ represents the costs of trial. The expected value for the plaintiff is $E(T)\mid_{H+cC+c}$, where $C$ is the value of the claim. According to the assumption of rationality, $C>H$. If $H>C$, then a rational plaintiff would have accepted the offer of $H$.

Using portfolio theory and the risk adjusted capital asset pricing model, I will determine the economic cost of a lawsuit, taking into account the new rules of court. At the start of any case, uncertainty is great and this uncertainty discounts the value of a suit (Rhee 2005). At an early stage, settlement may not be feasible as continued litigation may give rise to more information, which will reduce the variance of the portfolio.

In order to establish a plaintiff’s portfolio, I adapt a mathematical analysis of the Coase theorem (Coase 1960) which presents a cost-benefit analysis focusing on the expected value of litigation net the transaction costs. The standard theory of litigation states that settlement is always preferable to litigation, however this model is somewhat flawed. It merely focuses on the transaction costs in the matter and underestimates the true economic cost as it neglects to include certain legal aspects such as the evidence in the case and the confidence each party vests in their case. Rhee’s model separates the pricing of settlement and litigation and compares the two and by doing this he was able to reject the axiom that litigation is inferior to settlement.

The mathematical expression of the standard model developed by Coase (1960) where $V$ is the settlement valuation, $J$ is the expected judgement amount, $P$ is the probability of judgement and $T$ is the transaction cost. Ignoring the cash outlay of a settlement cost, as it is small in comparison to the cost of a trial, a defendant should only settle if

$$V< (J*P)+T$$

and conversely a plaintiff should only settle if

$$V>(J*P)-T$$

If the defendant’s maximum value is greater than the plaintiff’s minimum value, a positive contract zone exists, the larger this contract zone, the greater the possibility of settlement. These equations are rearranged to determine the relationship between probability and transaction costs. This model can also be used when parties have equal expectations of the outcome, or if one party is more optimistic than the other is. Thus, settlement is a function of transaction costs and the higher the transaction costs relative to the expected value, the higher the probability of settlement.

Rhee (2005) criticises four theoretical assumptions of the standard model and uses financial economics to reject the axiom that settlement is always preferable to trial. I will apply these same tools to the trial procedure in South Africa. The South African courts differ from American courts in that our courts are accusatorial and Americans are inquisitorial, so the risks are very different. The four fundamental assumptions of the standard model assume that rational agents should be able to predict their chances of prevailing on merits, expectations
therefore converge, diminishing optimism and creating a contract zone, since the transaction costs are always greater than the zero costs of bargaining, settlement is the more efficient method of dispute resolution.

By applying probability theory to a legal setting, it is clear that due to the randomness of the courts, legal probability cannot be deduced into an empirical concept, it is immeasurable, indeterminate and subjective (expand). Due to the uncertainty and imperfect information that is present at the start of a trail, weighting becomes an important concept in determining the variances. Weight is the ratio of known information to knowable information; this weight is used as it affects the perception of the variances. Instead of measuring the probably of an outcome, confidence becomes a factor in economic decision-making. Keynes noted in the *General Theory of Employment, Interest and Money* (1936), investment decisions are affected not only by forecasts, but also by the confidence in those forecasts.

According to the standard theory, continued litigation would yield many trials, however, in practice, continued litigation leads to more settlements, this could be due to the increase for information present after litigation. The only solution is to apply a random walk model to litigation where hedging strategies are available. Once the case is in terms of a portfolio, the weights can be established. Once the discovery phase is reached, weight increases substantially and in order to mitigate the downside risk, a plaintiff can hedge their position, because along with losing the case, often the party who does not succeed is liable for the legal costs of the suit.

A random walk model is much like noise trading in the stock market. The Coasian model assumes a noiseless legal market, which is not the case – no market is noiseless in a practical sense – information from one case enters the market via both the structured path (the case materials and judgments after completion of the trial) and an unstructured path (related to media coverage, rumours and other non-perfect information transfers). In order to understand the dispute of risk, the components of litigation uncertainty must be established. South African civil procedure differs to the American system used in Rhee’s article. I will investigate all the components of litigation that contribute to the risk of trial and split them into those that can be diversified and those that cannot be diversified, general risk and unique risk.

Once a portfolio is diversified minimising the risk, to determine the cost of litigation, a risk adjusted pricing method must be used. A variance term is incorporated into the model to capture the informational risks. This variance reduces the value of the gains expected and increases the negative value of liability in a suit. During a trail, the variance decreases as more information is acquired by both parties and the value of continued litigation diminishes.
4. Survey of Common Practice in Litigation

4.1 Aim of the Survey

A survey was prepared to develop practical responses in the present South African context of civil litigation based around questions that arose as a result of the previously presented model. I specifically referred to time delays and the reason for such delays. I also asked questions around frivolous parties and the success of their claims. The questions were developed using the South African rules of court and with the assistance of a litigator who is in practice in order to ensure that the questions would provide the necessary answers. The survey is attached in Appendix A.

This survey asked a number of questions surrounding the litigation process in South Africa. It focused on time taken in litigation, as well as delays both from a value and a probability perspective. It also looked at certain choices made by the parties that would influence decisions to be made in the litigation process, in order to determine whether the signalling effect occurs and what the impact thereof is.

The survey was sent out to a number of law firms, via email, as well as by hard copies which were hand delivered. It was then filled out by the attorneys who deal with the litigious matters in that firm. These firms were randomly selected, including equal numbers of small, medium and large firms. The surveys were filled in by the participants and then emailed back, or collected. Over 50 surveys were sent out of which 18 were received back and 12 were considered sufficiently complete to analyse. Six of the surveys were so incomplete that their information was excluded from further analysis. While this rate of return is low (36% returned – 24% usable) and the sample of firms in the legal fraternity is South Africa is small it provided sufficient information to at least develop a model that has some basis in the practitioners’ views on civil litigation process parameters.

4.2 Connection to the Model

The survey questions examined the signals which influenced decisions to settle in the model. Each of the steps in the model of Fig. 1 were the basis for one or more questions in the survey. Further questions were included so that additional material that could point to possible gaps in the model were also included. It was expected that the questions would give an indication whether any of the previous discussion on signalling was present in the practice of litigation and whether these signals were in fact heeded by legal practitioners in such a way that it had a clear effect on the decisions of the parties in line with theory reviewed.
4.3 Survey Results and Answers

The Following section summarizes the results for the various survey questions. Averages and variances as well as the spread are simultaneously displayed. In some cases the results are commented upon.

**Litigation in general**

1. In your experience, what is the average duration of opposed trial action proceedings in the High Court, from the first instruction or consultation to finalisation (whether through abandonment of the proceedings by either party, withdrawal, settlement, judgement or judgement on appeal):

<table>
<thead>
<tr>
<th>1 year</th>
<th>18 months</th>
<th>2 years</th>
<th>3 years</th>
<th>&gt; 3 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>4</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>Average</td>
<td>3.83</td>
<td>Variance</td>
<td>0.52</td>
<td></td>
</tr>
</tbody>
</table>

Due to the monetary jurisdiction differences between the Magistrates Court and High Courts, a potential litigant may not have a choice regarding whether or not to institute a matter in the court with the shortest average duration. Thus survey question 1 and 2 distinguished between the average duration of an opposed matter, should the matter fall within the monetary jurisdiction of either the Magistrates’ Court or the High Court.
3. In defended trial actions which have proceeded to trial and judgement what has been the longest duration of a trial from inception to judgement that you have been involved in?

<table>
<thead>
<tr>
<th>2 years</th>
<th>3 years</th>
<th>4 years</th>
<th>5 years</th>
<th>&gt; 5 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Average</td>
<td>4.083</td>
<td>Variance</td>
<td>1.17</td>
<td></td>
</tr>
</tbody>
</table>

4. In defended trial actions which have proceeded to trial and judgement what has been the shortest duration of a trial from inception to judgement that you have been involved in?

<table>
<thead>
<tr>
<th>6 months</th>
<th>1 year</th>
<th>18 months</th>
<th>2 years</th>
<th>3 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>7</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Average</td>
<td>2</td>
<td>Variance</td>
<td>0.73</td>
<td></td>
</tr>
</tbody>
</table>

5. In defended trial actions which have culminated in execution of a judgement, what has been the longest duration of a trial from inception to execution of the judgement?

<table>
<thead>
<tr>
<th>2 years</th>
<th>3 years</th>
<th>4 years</th>
<th>5 years</th>
<th>&gt; 5 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Average</td>
<td>3.67</td>
<td>Variance</td>
<td>1.70</td>
<td></td>
</tr>
</tbody>
</table>

The difference between survey question 3 and 5 is that survey question 5 includes the duration should the unsuccessful litigant refuse to abide by the court decision and subsequently it becomes necessary for the successful litigant to approach the sheriff of the court. Once the sheriff of the court has been approached, they will proceed to take all the requisite steps in order to sell the unsuccessful litigants property in execution.
6. In defended trial actions which have culminated in execution of a judgement, what has been the shortest duration of a trial from inception to execution of the judgement?

<table>
<thead>
<tr>
<th>6 months</th>
<th>1 year</th>
<th>18 months</th>
<th>2 years</th>
<th>3 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>6</td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Average</td>
<td>2.33</td>
<td>Variance</td>
<td>0.70</td>
<td></td>
</tr>
</tbody>
</table>

The difference between survey question 4 and 6 is that survey question 6 also includes the duration necessary for the sheriff to sell the unsuccessful litigant’s property in execution.

7. In your experience, how likely are each of the following factors be in deterring a plaintiff from pursuing legal remedies to recover a financial loss:

a. The cost of litigation would be likely to exceed the amount recovered

<table>
<thead>
<tr>
<th>Very unlikely</th>
<th>Unlikely</th>
<th>Not relevant</th>
<th>Likely</th>
<th>Very likely</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>0</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>Average</td>
<td>4.42</td>
<td>Variance</td>
<td>0.81</td>
<td></td>
</tr>
</tbody>
</table>

b. The amount recovered would be likely to exceed the costs of litigation, but the plaintiff does not have the financial means to litigate

<table>
<thead>
<tr>
<th>Very unlikely</th>
<th>Unlikely</th>
<th>Not relevant</th>
<th>Likely</th>
<th>Very likely</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>0</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>Average</td>
<td>4.17</td>
<td>Variance</td>
<td>0.70</td>
<td></td>
</tr>
</tbody>
</table>
c. The nature of the defendant. (For example, where the plaintiff is an individual with limited financial resources and the prospective defendant is a well-resourced corporation with the financial means to protract the litigation and cause the costs to become prohibitive, alternatively, where the defendant is a so-called “man of straw” who is unlikely to have sufficient assets to satisfy a judgement)

<table>
<thead>
<tr>
<th>Very unlikely</th>
<th>Unlikely</th>
<th>Not relevant</th>
<th>Likely</th>
<th>Very likely</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>2</td>
<td>0</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>Average</td>
<td>3.83</td>
<td>Variance</td>
<td>0.88</td>
<td></td>
</tr>
</tbody>
</table>

d. Previous cases where such a defendant was involved. (For example, if the defendant has a reputation to draw cases out until the plaintiff’s resources are exhausted)

<table>
<thead>
<tr>
<th>Very unlikely</th>
<th>Unlikely</th>
<th>Not relevant</th>
<th>Likely</th>
<th>Very likely</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>6</td>
<td>1</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Average</td>
<td>3.08</td>
<td>Variance</td>
<td>1.54</td>
<td></td>
</tr>
</tbody>
</table>

e. The plaintiff has the financial resources available, but does not have the time to litigate

<table>
<thead>
<tr>
<th>Very unlikely</th>
<th>Unlikely</th>
<th>Not relevant</th>
<th>Likely</th>
<th>Very likely</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>7</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Average</td>
<td>2.5</td>
<td>Variance</td>
<td>1.18</td>
<td></td>
</tr>
</tbody>
</table>
**Firm specific decisions**

8. Where a prospective plaintiff has been advised not to pursue litigation because the costs may exceed the amount of the claim and/or because the litigation will be protracted, approximately what percentage of such clients nevertheless elect to proceed with legal action:

<table>
<thead>
<tr>
<th></th>
<th>&lt; 25%</th>
<th>Between 25% and 50%</th>
<th>Between 50% and 75%</th>
<th>&gt; 75%</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>5</td>
<td>3</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td>1.92</td>
<td>Variance</td>
<td>0.63</td>
<td></td>
</tr>
</tbody>
</table>

9. What is the average monetary value of the majority of claims instituted by your firm?

| Most of the claims are within the jurisdiction of the Magistrate’s Court (under R300 000) | 4 | Average |
| Between R300 000 and R750 000 | 4 | 2.08 |
| Between R750 000 and R3 million | 3 | Variance | 0.99 |
| > R3 million | 1 |           |

10. Is there a minimum value of claims that your firm deals with? (If yes, what is that value?)

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All participants answered No</td>
</tr>
</tbody>
</table>
11. Does the amount of a claim dealt with by your firm determine or have any bearing on then priority given to that claim by the firm or the speed or urgency with which that claim is prosecuted by the firm?

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5</td>
<td>7</td>
</tr>
</tbody>
</table>

12. Approximately how many litigious matters is your firm able to accept or deal with effectively at one time?

There was a large range in this number from 20 to over 1000. The most common answers were between 70 and 150\(^10\).

13. Would your firm turn away a prospective litigant on the basis that the firm’s professional staff, due to their existing workload, do not have capacity to deal effectively with the client’s case?

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4</td>
<td>8</td>
</tr>
</tbody>
</table>

14. Does the firm work mainly on:

<table>
<thead>
<tr>
<th>Fee Basis</th>
<th>Contingency Basis</th>
<th>Both</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>7</td>
</tr>
<tr>
<td>Average</td>
<td>2.17</td>
<td>Variance 1.06</td>
</tr>
</tbody>
</table>

\(^{10}\) This is expected as the questionnaire was given to both small and large firms. Small firms will take on around 100 matters whereas larger firms have the capacity to deal with many thousands of matters.
In this question, half of the answers were on a fee basis only, and the other half was for both a fee and contingency basis. Often larger firms will work on a fee basis only, whereas smaller firms will be prepared to do the work on risk for a contingency fee.

15. If you elected fees or both in the previous question, what percentage of the clients are on a fee basis

<table>
<thead>
<tr>
<th>&lt; 25%</th>
<th>Between 25% and 50%</th>
<th>Between 50% and 75%</th>
<th>&gt; 75%</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>2</td>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td>Average</td>
<td>3.58</td>
<td>Variance</td>
<td>0.63</td>
</tr>
</tbody>
</table>

16. What is the average duration of the discovery process? (From close of pleadings to receipt of the discovered documents, if the parties make a full disclosure of all relevant documents and no additional discovery is sought (for example in terms of Rule 35(3))):

<table>
<thead>
<tr>
<th>&lt; 2 months</th>
<th>Between 2 and 6 months</th>
<th>Between 6 months and one year</th>
<th>Between one and two years</th>
<th>&gt; 2 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>8</td>
<td>3</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Average</td>
<td>2.42</td>
<td>Variance</td>
<td>0.45</td>
<td></td>
</tr>
</tbody>
</table>

17. In your experience, how likely are the following factors to contribute to the delay in the finalisation of a trial action:

a. Inadequate discovery by either or both parties

<table>
<thead>
<tr>
<th>Very unlikely</th>
<th>Unlikely</th>
<th>Not relevant</th>
<th>Likely</th>
<th>Very likely</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>4</td>
<td>0</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>Average</td>
<td>3.42</td>
<td>Variance</td>
<td>1.17</td>
<td></td>
</tr>
</tbody>
</table>
b. Delay in the allocation of trial dates

<table>
<thead>
<tr>
<th></th>
<th>Very unlikely</th>
<th>Unlikely</th>
<th>Not relevant</th>
<th>Likely</th>
<th>Very likely</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>3</td>
<td>1</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>Average</td>
<td>4.17</td>
<td></td>
<td>Variance</td>
<td>0.15</td>
<td></td>
</tr>
</tbody>
</table>

c. Delay in the continuation of part heard trials

<table>
<thead>
<tr>
<th></th>
<th>Very unlikely</th>
<th>Unlikely</th>
<th>Not relevant</th>
<th>Likely</th>
<th>Very likely</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>10</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Average</td>
<td>3.5</td>
<td></td>
<td>Variance</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

d. Postponements sought by either party

<table>
<thead>
<tr>
<th></th>
<th>Very unlikely</th>
<th>Unlikely</th>
<th>Not relevant</th>
<th>Likely</th>
<th>Very likely</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>8</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Average</td>
<td>4.33</td>
<td></td>
<td>Variance</td>
<td>0.24</td>
<td></td>
</tr>
</tbody>
</table>

e. Amendment of pleadings by either party

<table>
<thead>
<tr>
<th></th>
<th>Very unlikely</th>
<th>Unlikely</th>
<th>Not relevant</th>
<th>Likely</th>
<th>Very likely</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>2</td>
<td>1</td>
<td>9</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>Average</td>
<td>3.58</td>
<td></td>
<td>Variance</td>
<td>0.63</td>
<td></td>
</tr>
</tbody>
</table>
f. Delays in the handing down of judgements

<table>
<thead>
<tr>
<th></th>
<th>Very unlikely</th>
<th>Unlikely</th>
<th>Not relevant</th>
<th>Likely</th>
<th>Very likely</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delays in the handing down of judgements</td>
<td>0</td>
<td>3</td>
<td>2</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Average</td>
<td>3.58</td>
<td>Variance</td>
<td>1.36</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

18. In your experience, what percentage of claims are postponed at the first trial date

<table>
<thead>
<tr>
<th>Percentage</th>
<th>&lt; 25%</th>
<th>Between 25% and 50%</th>
<th>Between 50% and 75%</th>
<th>&gt; 75%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Average</td>
<td>1.7</td>
<td>Variance</td>
<td>0.68</td>
<td></td>
</tr>
</tbody>
</table>

19. How many postponements occur before the matter is heard?

<table>
<thead>
<tr>
<th>Postponements</th>
<th>One</th>
<th>Two</th>
<th>Three</th>
<th>Four</th>
<th>&gt; Four</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>7</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Average</td>
<td>1.3</td>
<td>Variance</td>
<td>0.23</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
20. What percentage of claims settle after the letter of demand?

<table>
<thead>
<tr>
<th>&lt; 25%</th>
<th>Between 25% and 50%</th>
<th>Between 50% and 75%</th>
<th>&gt; 75%</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Average</td>
<td>1.27</td>
<td>Variance</td>
<td>0.42</td>
</tr>
</tbody>
</table>

21. What percentage of claims settle after the summons has been delivered?

<table>
<thead>
<tr>
<th>&lt; 25%</th>
<th>Between 25% and 50%</th>
<th>Between 50% and 75%</th>
<th>&gt; 75%</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>4</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Average</td>
<td>1.91</td>
<td>Variance</td>
<td>0.69</td>
</tr>
</tbody>
</table>

22. What percentage of claims settle after completion of the discovery process, but prior to trial?

<table>
<thead>
<tr>
<th>&lt; 25%</th>
<th>Between 25% and 50%</th>
<th>Between 50% and 75%</th>
<th>&gt; 75%</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>3</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Average</td>
<td>2.45</td>
<td>Variance</td>
<td>0.87</td>
</tr>
</tbody>
</table>

23. What percentage of claims settle less than one month before trial

<table>
<thead>
<tr>
<th>&lt; 25%</th>
<th>Between 25% and 50%</th>
<th>Between 50% and 75%</th>
<th>&gt; 75%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.</td>
<td>9</td>
<td>1</td>
</tr>
<tr>
<td>Average</td>
<td>2.91</td>
<td>Variance</td>
<td>0.49</td>
</tr>
</tbody>
</table>
24. What percentage of litigants are cooperative, deliver the correct documents at the correct time

<table>
<thead>
<tr>
<th></th>
<th>&lt; 25%</th>
<th>Between 25% and 50%</th>
<th>Between 50% and 75%</th>
<th>&gt; 75%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>6</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Average</td>
<td>2.27</td>
<td>Variance</td>
<td>0.42</td>
<td></td>
</tr>
</tbody>
</table>

25. From the point of view of the defendant, does the nature of the plaintiff have an impact on the offer made? For example, if the plaintiff is an individual or a firm

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

26. Are there certain “acceptable” offers in specific cases, or is each offer case specific

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In this Question, half of the participants said yes, while the other half said no, indicating an almost random feeling about whether there ever is an “acceptable” offer.
27. If you answered YES in the previous question, what are those “acceptable” offers? (Comments by Participants)

- Depending on precedents or "without prejudice" correspondence requesting settlement payments
- Each offer is specific to circumstance
- Depends on each case
- 75% of the claim
- An offer that the plaintiff or potential plaintiff is prepared to accept in order to avoid litigation
- Most of the amount in order to avoid litigation
- Half or 3/4 of the claimed amount
- 80% of the claim
- Reasonable apportionment of delictual damages. Offers that take into account the cost of proceeding with litigation

28. How do the following signals affect an offer made by a defendant?

a. If the party instituting the action is an individual rather than a firm

<table>
<thead>
<tr>
<th>Increase the potential offer</th>
<th>1</th>
<th>Average: 2.42</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decrease the potential offer</td>
<td>5</td>
<td>Variance: 0.45</td>
</tr>
<tr>
<td>The defendant remains indifferent</td>
<td>6</td>
<td></td>
</tr>
</tbody>
</table>

b. If the party who is initiating the claim approaches a larger firm where it can be assumed that the plaintiff is paying fees on a contingency basis

<table>
<thead>
<tr>
<th>Increase the potential offer</th>
<th>9</th>
<th>Average: 1.42</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decrease the potential offer</td>
<td>1</td>
<td>Variance: 0.63</td>
</tr>
<tr>
<td>The defendant remains indifferent</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>
Where a plaintiff approaches a large firm, it send a signal to the defendant that he is willing to invest financially in the case, and therefore believes that his claim is strong. However, it could also be a bluff sent by the plaintiff to the defendant to try to induce a larger settlement.

c. If the plaintiff makes use of expert witnesses

<table>
<thead>
<tr>
<th>Increase the potential offer</th>
<th>6</th>
<th>Average: 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decrease the potential offer</td>
<td>0</td>
<td>Variance: 1.09</td>
</tr>
<tr>
<td>The defendant remains indifferent</td>
<td>6</td>
<td></td>
</tr>
</tbody>
</table>

Half of the participants said that the offer would increase and half said the defendant would remain indifferent. If the parties make use of expert witnesses, it would send a signal that they are willing to invest in the case, and that the facts are in their favour. This may induce the other party to settle earlier.

29. Does the legal system allow for spurious or unfounded litigation?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>3</td>
</tr>
</tbody>
</table>

30. Can a plaintiff whose claim lacks merit nevertheless extract a settlement from a defendant purely due to the cost and inconvenience inherent in litigation?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>2</td>
</tr>
</tbody>
</table>
31. If so, in your opinion what percentage of claims are spurious / unfounded?

<table>
<thead>
<tr>
<th></th>
<th>&lt; 25%</th>
<th>Between 25% and 50%</th>
<th>Between 50% and 75%</th>
<th>&gt; 75%</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>4</td>
<td>1</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td>1.55</td>
<td>Variance</td>
<td>0.47</td>
<td></td>
</tr>
</tbody>
</table>

4.4 Result forms

Six of the questions in the survey were used in the statistical model, however, there are also non-numerical results that are important in the overall analysis. Many of the questions focus on reasons for delay and signalling actions made by parties, which can result in a speedier trial, or even a larger settlement. These results affect the overall litigation process as experienced by the plaintiff, defendant and the various counsel. These results will be further discussed in section 5.5.
5. Comparison of Theory and Experimentation

5.1 Introduction

Using the initial model from Fig. 1 and the various results discussed in Chapter 4 from the survey, a regression model was created in Visual Basic. The model is used to predict whether it would be advisable for a plaintiff to institute an action and see the matter through to judgement by a court or settle prior to judgement for a reduced sum. The model, as developed, will compare the option value of settling the matter at the coming into being of the action against the present value that the plaintiff will if they see the matter through to judgement by a court. The model uses a Monte Carlo\textsuperscript{11} technique so that a large number of iterations are performed and an estimate of the expected value of the various outputs is achieved and the results will be discussed below.

5.2 Development of the Statistical Model

A plaintiff’s first avenue in order to try settle the matter will be to issue the defendant with a letter of demand. The letter of demand is the most cost effective way of alerting the defendant to your possible claim and, hopefully, to get the defendant to settle the matter. The letter of demand does not require the assistance of legal professionals as it can be written by the plaintiff personally. The results from the surveys show the following with respect to the percentage chance that the matter will be settled after sending a letter of demand:

<table>
<thead>
<tr>
<th>Percentage</th>
<th>&lt; 25%</th>
<th>Between 25% and 50%</th>
<th>Between 50% and 75%</th>
<th>&gt; 75%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Count</td>
<td>9</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Average</td>
<td>1.27</td>
<td>Variance</td>
<td></td>
<td>0.42</td>
</tr>
</tbody>
</table>

The model incorporates these results and thus the chance that the matter proceeds past the letter of demand stage is weighted in respect of the survey results. Usually a letter of demand will include a clause stating that the defendant will have a time period within which the defendant can settle the claim, failing which legal proceedings in court will follow\textsuperscript{12}. In the model a random time period of between one and fourteen calendar days was included in order within which the defendant can choose to settle the claim or reject the claim.


\textsuperscript{12} Theophilopoulous, Rowan, van Heerden and Boraine, \textit{Fundamental Principles of Civil Procedure}, 2006 p29
Assuming the defendant does not settle the matter after receiving the letter of demand, the plaintiff will now be required to make a choice whether or not they will want to refer the matter to court. The plaintiff’s decision will hinge on two major considerations. The first consideration the plaintiff will have to consider is the quantum of the claim. The second consideration regards the nature of the defendant. With respect to the quantum of the claim, an assumption was made that at a quantum of R250 000, only 63,21% of plaintiffs would pursue the matter any further. Based on this initial assumption a probability table was drawn up that was used throughout the model. The table is shown below:

<table>
<thead>
<tr>
<th>Claim Value</th>
<th>Probability of claim being pursued</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0.00%</td>
</tr>
<tr>
<td>1 000</td>
<td>0.40%</td>
</tr>
<tr>
<td>10 000</td>
<td>3.92%</td>
</tr>
<tr>
<td>100 000</td>
<td>32.97%</td>
</tr>
<tr>
<td>250 000</td>
<td>63.21%</td>
</tr>
<tr>
<td>1 000 000</td>
<td>98.17%</td>
</tr>
<tr>
<td>10 000 000</td>
<td>100.00%</td>
</tr>
<tr>
<td>100 000 000</td>
<td>100.00%</td>
</tr>
<tr>
<td>1 000 000 000</td>
<td>100.00%</td>
</tr>
</tbody>
</table>

Table 7: Probability of claims being pursued based on value

With regard to the second consideration, the nature of the defendant, the model randomly chooses whether or not the defendant is in the upper income level, middle income level or the lower income level. The income level of the defendant is a consideration that will affect whether or not the plaintiff chooses to continue with the action. The lower the income level of the consumer the lower the chance that the plaintiff will pursue the matter. The income level of the defendant has not been weighted in any way as the plaintiff never has any control over the identity of the defendant in a litigious matter.

A random time period of between one and fourteen calendar days was added in order to allow the plaintiff to make the decision regarding whether or not they want to pursue the matter.

If the plaintiff makes the decision to pursue the matter, he will then take some time to collect his own evidence before approaching an attorney for legal representation. A time period of 60 calendar days was chosen as the maximum time period a plaintiff would take to collect his own evidence. The model weights the time period taken by the plaintiff against the size of the claim. The random distribution table shown above was used to do the weighting.

After the plaintiff has collected their own evidence, they will refer the matter to an attorney, who will then collect further evidence, prepare pleadings and, if necessary, brief an advocate. A time period of 180 calendar days was chosen as the maximum time period the legal representatives would take to perform these duties. The model weights the time period taken
by the legal representatives against the size of the claim. Again, the random distribution table shown above was used to do the weighting.

After the collection and processing of evidence by the legal representatives, the plaintiff will be informed by the legal representatives whether or not the matter is frivolous. Below are the results of the question asked in the survey regarding what percentage of matters referred to them by clients, do they consider frivolous:

<table>
<thead>
<tr>
<th>&lt; 25%</th>
<th>Between 25% and 50%</th>
<th>Between 50% and 75%</th>
<th>&gt; 75%</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>4</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Average</td>
<td>1.55</td>
<td>Variance</td>
<td>0.47</td>
</tr>
</tbody>
</table>

Based on these results the model statistically determines whether or not the current matter is frivolous. Should the current matter turn out to be frivolous a further question from the survey is applied to determine whether or not the plaintiff will continue to pursue despite the legal representative advising them that the matter is frivolous. The results of that question are shown below:

<table>
<thead>
<tr>
<th>&lt; 25%</th>
<th>Between 25% and 50%</th>
<th>Between 50% and 75%</th>
<th>&gt; 75%</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>5</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Average</td>
<td>1.92</td>
<td>Variance</td>
<td>0.63</td>
</tr>
</tbody>
</table>

Should the current matter not turn out to be frivolous, the above step is not used in the model and the percentage chance that the matter continues is the same as the previous step ie collection of evidence by the plaintiff and legal representative.

Should the matter continue, the legal representative will issue summons upon the defendant. The survey question regarding the percentage of claims settled after the issuance of the summons is then applied to determine if the matter will be settled upon service of summons. The results of the survey question is shown below:

<table>
<thead>
<tr>
<th>&lt; 25%</th>
<th>Between 25% and 50%</th>
<th>Between 50% and 75%</th>
<th>&gt; 75%</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>4</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Average</td>
<td>1.91</td>
<td>Variance</td>
<td>0.69</td>
</tr>
</tbody>
</table>

Should the defendant choose to settle the matter after summons, a random period of between 1 and 10 days is given in order for the defendant to settle the matter.
Should the summons be issued and the matter not informally settled, service of all pleadings shall have to take place. According to High Court Rule 19(1) the defendant has 10 court days (roughly 14 calendar days) in order to file their Notice of Intention to Defend. After filing their Notice of Intention to Defend, the defendant then has 20 court days (roughly 28 calendar days) in order to file their Plea and Counterclaim. This is according to High Court Rule 22(1). After filing the Plea and Counterclaim, the plaintiff then has 15 court days (roughly 21 calendar days) in order to file their Replication. This is according to High Court Rule 25(1). After filing the Replication, each of the parties then have 10 court days (roughly 14 calendar days) in order to file any further pleadings. This is according to High Court Rule 25(5). For this reason the model randomly chooses a time period of between of period between 50 and 100 calendar days for the filing of pleadings.

After close of pleadings, the discovery phase begins. The survey asked what is the average duration of the discovery phase is, from close of pleadings, till receipt of discovered documents if the parties make disclosure of all relevant document and no further discovery is sought. The result of the survey question is shown below:

<table>
<thead>
<tr>
<th></th>
<th>&lt; 2months</th>
<th>Between 2 and 6 months</th>
<th>Between 6 months and one year</th>
<th>Between one and two years</th>
<th>&gt; 2 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>8</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td>2.42</td>
<td>Variance</td>
<td></td>
<td></td>
<td>0.45</td>
</tr>
</tbody>
</table>

The next possible settlement time will be prior to the matter coming before the court. The parties are free to settle the matter even though the matter has been set down on the court roll. The results of the question regarding how many matters are settled within one month of the trial date are shown below:

<table>
<thead>
<tr>
<th></th>
<th>&lt; 25%</th>
<th>Between 25% and 50%</th>
<th>Between 50% and 75%</th>
<th>&gt; 75%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.</td>
<td>9</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td>2.91</td>
<td>Variance</td>
<td>0.49</td>
<td></td>
</tr>
</tbody>
</table>

Should the defendant choose to settle the matter after summons, a random period of between 1 and 10 days is given in order for the defendant to settle the matter.

Should the matter proceed to court and judgement be given, a random value between 1 and 10 is determined as the time period for the trial. An assumption was made regarding the percentage chance that the plaintiff will be successful. The weighting is in favour of a positive decision as the probability that the matter is frivolous and the plaintiff continues despite this
fact has already been taken into account earlier in the model. The assumptions made by the model, regarding the percentage of the total claim awarded by the court are as follows:

<table>
<thead>
<tr>
<th></th>
<th>&lt; 25%</th>
<th>Between 25% and 50%</th>
<th>Between 50% and 75%</th>
<th>&gt; 75%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>4</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>Average</td>
<td>4</td>
<td></td>
<td>Variance</td>
<td>0.6</td>
</tr>
</tbody>
</table>

This value is used to weight the final value that the plaintiff will receive from the court.

5.3 Various Parameters Revisited

**Main points in the Theoretical Model**

- Letter of demand
- Choice to litigate
- Time period of information to collect
- Choice of counsel
- Discovery period
- Choice by defendant to settle the matter
- The offer is either accepted or rejected. If rejected the matter will proceed to trial
- Once the matter has proceeded to trial, the final decision delivered by the court will be either favourable or unfavourable.

**Main points in the survey**

- Questions focused on time periods
  - Duration of proceedings
  - Duration of discovery
  - Number of cases postponed and amount of postponements
- The factors that would deter a plaintiff from recovering a financial loss
  - The claim amount in relation to the cost of litigation, taking into account the plaintiff’s financial means
  - The nature of the defendant and if the defendant has been involved in similar cases
  - Does the South African legal system allow for spurious litigation
- Firm specific questions
Average value of claims
Number of matters dealt with at one time
Do specific claims get preference
Does the firm charge on a fee or contingency basis

Factors that would delay the trial action
- Inadequate discovery
- Postponement
- Amendment of pleadings
- Cooperation of litigants

Offer and settlement
- Stages where parties settle
- Acceptable offers
- Signals affecting the offer
- Spurious claims

Main points of the Statistical Model

Claim
- The state of nature would have an effect on the amount. In nature, an event would occur that would give rise to a claim. Once there is a claim of a certain value, the plaintiff would decide whether to send a letter of demand, taking into account various elements in nature, such as the quantum of the claim.
  - A random amount between 0 and R250m will be chosen as the claim value.
  - The plaintiff will then take a randomised time period of 1 to 14 days to send the letter of demand.

Letter of demand will be sent to the defendant
- The letter of demand would be the first signal sent from the plaintiff to the defendant signalling his intentions to attempt to get settlement.
  - This step in the statistical model uses the answers from Question 20 of the survey to predict whether or not the defendant will settle the matter after receiving the letter of demand.
  - The defendant will then take a randomised time period of 1 to 14 days to either settle or reject the claim made in the letter of demand.

Defendant type
- The type of defendant will send a signal to the plaintiff. If the defendant is well-off, there is a larger change that the plaintiff will pursue the matter as the defendant is able to either defend the matter or settle. If the defendant is a “man of straw” it is unlikely that the plaintiff will pursue the matter. Even if the plaintiff is to pursue the matter and receive judgement in his favour, the defendant will not be able to fulfil such judgement.
  - From the survey, it was noticed that the nature of the defendant and the previous matters the defendant was involved in had a significant impact on whether or not the plaintiff would be deterred from instituting a case
to recover a financial loss. Initially the defendant’s nature, was not included in the theoretical model but due to the survey responses it was decided to incorporate the defendant’s nature as a variable which would affect the outcome of the statistical model. The statistical model randomly selects one of the following defendant types: well-off, average and “man-of-straw”.

- **Decision on the type of counsel**
  - The type of counsel chosen will send a signal to the defendant about how serious and willing to invest the plaintiff is. If the plaintiff chooses a large law firm, it sends the signal that he has faith in his case and is willing to make a large financial investment in the matter. However, a frivolous plaintiff may also elect to approach a large law firm as a bluff, to show that he is investing to try and induce an early settlement from the defendant in order for the matter not to be pursued. Both parties are aware that the choosing of a large law firm may be a bluff.
    - The plaintiff will then take a time period of 0 to 60 days, where the plaintiff will collect his own evidence. More days will be spent where the claim amount is higher.
    - Question 28b of the survey indicates that a settlement amount is likely to be higher where the plaintiff has opted to be represented by a large firm.
    - There is a time period of 0 to 180 days allocated for counsel to collect evidence. Again more days will be spent where the claim amount is higher.

- **After the evidence collection, counsel will inform the client of the merits of the case based on information collected:**
  - Once counsel has collected information and exchanged documents, they are able to inform the client of the merits of the case. When a client approaches a law firm, they may have a clear right to compensation, however, once more evidence is collected by his attorney, and from the defendant, the defendant may have a clear defence, and it would be frivolous to pursue the matter and often time’s matters may settle once evidence is collected.
    - Question 31 of the survey deals with frivolous claims and it is incorporated into the model to determine whether or not the matter under consideration will be frivolous.
    - Question 8 of the survey deals with claims that are frivolous and despite being advised by counsel of that fact, pursue the matter in any case. If the previous step determines that the matter under consideration is frivolous, the results of Question 8 of the survey will be used to determine whether or not the plaintiff will proceed with the matter despite this fact.
    - The model assumes a period of 5 to 10 days to decide whether or not to proceed after receiving counsel’s advice.
• Summons is issued
  o Question 21 of the survey deals with settlement after summons. Using the results it is calculated predicted whether or not the defendant is likely to settle after receiving the summons.

• Discovery period
  o Question 16 of the survey deals with the average length of the discovery period and based upon the results a time period is added in this step for discovery.
  o Question 23 of the survey deals with the number of cases that settle one month prior to trial and based upon the results of the survey it is calculated whether the current matter will be settled less than one month prior to the trial. While the theoretical model does postulate that the parties can settle prior to trial during the discovery phase, the survey revealed that a majority of cases that proceeded this far would actually be settled less than a month before the trial.

• The decision of the court
  o Unfortunately the survey did not ask what the average percentage of the amount claimed a successful plaintiff is likely to receive and thus a distribution curve was created which is biased towards receiving closer to the full amount than nothing as a plaintiff who has proceeded to this point probably has quite a strong case.
  o A random time period of 30 to 40 days was allocated for the court to give its decision.

<table>
<thead>
<tr>
<th></th>
<th>Theoretical model</th>
<th>Survey questions</th>
<th>Statistical model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Claim</td>
<td>Not relevant</td>
<td>Question 9</td>
<td>ZAR1 to ZAR250 million (random)</td>
</tr>
<tr>
<td>Letter of Demand</td>
<td>Yes</td>
<td>Question 20</td>
<td>Yes</td>
</tr>
<tr>
<td>Defendant type</td>
<td>Not relevant</td>
<td>Question 7c</td>
<td>Yes, randomised</td>
</tr>
<tr>
<td></td>
<td>Due to the response received, where 10 participants indicated that this was likely to affect a settlement offered, it was included in the statistical model</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Choice of Counsel</td>
<td>Yes</td>
<td>Question 28b</td>
<td>Yes based on question 28b where a settlement value would be higher for a larger firm</td>
</tr>
<tr>
<td>Frivolous Claim</td>
<td>Not relevant</td>
<td>Question 31 – is the claim frivolous Question 8 – if the claim is frivolous, how often does the plaintiff continue</td>
<td>Yes</td>
</tr>
<tr>
<td>Summons</td>
<td>Yes</td>
<td>Question 21</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Yes, in the theoretical model, this is where most of the signalling occurred and information is collected.

Table 8: Summary of Statistical and Theoretical model compared with Survey results.

<table>
<thead>
<tr>
<th>Discovery</th>
<th>Question 16</th>
<th>Question 23</th>
<th>Trial and Court Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td></td>
<td></td>
<td>Favourable or unfavourable</td>
</tr>
<tr>
<td>Question 23</td>
<td>Yes</td>
<td></td>
<td>No</td>
</tr>
<tr>
<td>Yes, as a time period</td>
<td></td>
<td></td>
<td>Assumed</td>
</tr>
<tr>
<td>based on the survey.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In this time period</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>there can be two end points based on each</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>of the survey questions</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5.4 Statistical Model Results

In the model, the parameters that were focused on were the probability of success, probability of settlement, value of settlement as well as time to reach settlement. Based on these parameters, the results of the statistical model are graphically displayed and discussed below.

The graph in figure 6 displays the time taken to settle a claim in relation to the value of the claim as well as at which major point in the litigation process the settlement will occur. Figure 6 shows no unsettled claims and time delays. Figure 7 shows the time to the final stage of the litigation process for such claims that result in no financial gain for the defendant.

Figure 6: Time to Settle vs Claim value
The graph displays the four stages in the litigation process where settlement can be reached. According to the results of the statistical model, settlement as a result of a letter of demand will always occur within 1 to 14 days of receipt of the letter by the defendant. Thus it will always be the fastest way to reach settlement, regardless of the quantum of the claim. The graph shows that issuing a summons is the second quickest way in which to procure settlement. This makes sense as it is also the second stage in the litigation process. Once summons has been issued, there is a legislated period for the filing of pleadings and discovery of documents and this is the reason there is a distinctive gap between the summons curve and the other phases. If the matter proceeds past the summons phase and is settled prior to court, the minimum period to reach settlement is 136 days and the maximum period is 1527 days and the average settlement time is 417 days. If the matter reaches court, the minimum period to reach settlement is 169 days, the maximum is 1466 days and the average settlement time is 443 days. These results are to be expected as the time will logically increase the more phases you require to reach settlement. Further we can deduce that as the value of the claim increases so does the time taken to reach settlement.

![Diagram showing time to settlement vs claim value]

**Figure 7: Time to final non-settlement vs claim value**

The results displayed in Figure 7 are to be expected. As the claim value increases so does the time taken to reach even a non-settlement. This is a logical response due to the fact that plaintiffs who have larger claims will obviously put in more effort to reach some sort of settlement than a plaintiff with a smaller claim. In other words the smaller the claim the more likely a plaintiff is to agree to give up the claim then a plaintiff with a larger claim.
Figure 8: Estimated Percentage Probability of a claim being settled vs Claim value

Fig. 8 displays graphically the four stages in the litigation process where settlement can be reached and the probability that claims of certain values will be settled. With regard to the letter of demand, only about 20% of claims will be settled in this manner. This is in line with the responses gathered from survey Question 20 which asked “What percentage of claims settle after the letter of demand?”13 With regard to the three other stages of the litigation process, it is clear that the percentage chance of reaching a settlement increases as the claim value increases but only until the claim value reaches roughly R1m where the probability of reaching settlement averages between 53% and 56%.

13 According to the results of Question 20 of the Survey, 9 out of the 11 people who answered the question believed that less than 25% of disputes are settled after sending a letter of demand.
Figures 9(a)-(c): Individual Estimated Percentage Probability of a claim being settled vs Claim value.

Figures 9(d): Average Estimated Percentage Probability of a claim being settled vs Claim value for a variety of settlement forms.

The first three graphs (Fig 9(a) – (c)) display each individual stage of the litigation process’ probability of a claim being settled at various claim values. The first three graphs also include an average in order to show the average probability that a claim will be settled as the amount claimed increases. The final graph (Fig 9(d)) is a comparison of the average probability of settlement for the various litigation stages against the value of the claim. It can be seen that the trend rises steeply as the claim value grows until a plateau is reached at about R1m. It also bears noting that while the average remains constant the variance is actually decreasing as shown in Fig 10(a)-(f).
Figure 10(a)-(f): Models of Average Probability of Settlement versus Claim Value
Figure 11: Percentage Settled versus Claim Value

The graph in Fig. 11 displays the percentage settled versus the claim value. Unsurprisingly, if the matter can be settled after sending a letter of demand, the percentage settled will be very close to 100%. However, should the matter proceed past the letter of demand stage, we can see a clear reduction in the amount received from settlement. The average amount settled, regardless of claim value, is 55% if the matter is settled after summons and 52% if the matter is settled prior to trial.

These graphs in Fig. 12(a) – (d) displays the settlement value divided by the option value and they are plotted against the actual value of the claim. The letter of demand graph is interesting in the sense that despite the actual claim value, the settlement value will always be higher than the option value. This is mostly due to the fact that it is quite uncommon, as was seen in the survey, for the parties to reach settlement after one of the parties has sent a letter of demand. Thus the option value – being based on expected values ab initio – is a very poor forecast of the value of the settlement prior to the initiation of a claim because of the low probability of certain types of events. Interestingly, the average settlement value divided by option value, for claim values over R1m, averages 99% for settlement at the summons phase and 91% for both settlements prior to trial and settlements after a court decision, this indicates that at least if the model parameters are correct then an initial option analysis can develop a close (if somewhat inflated) estimate of the final settlement value. In the case of settlements at the letter of demand phase this is not true – the model indicates that the average settlement value divided by option value is a staggering 1233%. This, when investigated, was not an error but an indication that the letter of demand has such a low probability of occurrence that when it does take place the
value achieved is significantly higher than the model predicts. If anything can be construed from this it is that the estimates of settlement via letter of demand is rated so lowly by the survey persons that it is in effect all but excluded from their analysis of the value of a claim.

Figure 12 (a)-(d): Individual Settlement Value divided by Option Value versus Claim Value
An interesting effect that the graphs in Fig 13(a) – (c) displays is the time a plaintiff can expect to wait, *ab initio*. The interesting areas of the graph for all instances where the option value exceeds the claim value. The table below displays all the instances where the option value exceeds the claim value and the time periods a plaintiff can expect to wait. The letter of demand will not be included in the table due to the fact that the option value will never exceed the claim value for the reasons discussed above and also that the time to settle for a letter of demand settlement is limited to the first 14 days of the process.

<table>
<thead>
<tr>
<th></th>
<th>Summons</th>
<th>Prior to Trial</th>
<th>Court Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min</td>
<td>28</td>
<td>138</td>
<td>185</td>
</tr>
<tr>
<td>Max</td>
<td>805</td>
<td>1527</td>
<td>1298</td>
</tr>
<tr>
<td>Average</td>
<td>119</td>
<td>458</td>
<td>477</td>
</tr>
</tbody>
</table>

Table 9: Analysis of the days taken for the option value to exceed the claim value

An option, *in casu*, is an *ab initio* assessment of the value a plaintiff can expect to receive once they consider the probability of all eventualities and the time taken to bring about those eventualities. Thus if a plaintiff was considering instituting an action he would at least hope, *ab initio*, for the option value to equal the claim value. This being the case, the plaintiff could expect to wait an average of 119 days if the plaintiff receives a settlement offer at the summons phase and 458 days if the matter is to be settled prior to court and 477 if the plaintiff must wait for the court to hand down judgement in the case.
A very interesting trend that was discovered was the effect of the quality of counsel on the settlement value that can be expected. Survey question 28b asked the following, “If the party who is initiating the claim approaches a larger firm where it can be assumed that the plaintiff is paying fees on a contingency basis”, and the results are below:

| Increase the potential offer | 9 | Average: 1.42 |
| Decrease the potential offer | 1 | Variance: 0.63 |
| The defendant remains indifferent | 2 |

From the results it can be determined that 75% of the people interviewed thought that approaching a large firm would increase the potential offer, 17% of the people interviewed thought it would have no effect on the offer of settlement and the final 8% of people interviewed thought that approaching a larger firm would actually decrease the potential settlement offer.

The effect of approaching a large firm as compared to other firms is displayed in the tables below:

<table>
<thead>
<tr>
<th>Plaintiff with weak/frivolous case</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Large Firm</strong></td>
</tr>
<tr>
<td>Mean</td>
</tr>
<tr>
<td>Standard Error</td>
</tr>
<tr>
<td>Median</td>
</tr>
<tr>
<td>Mode</td>
</tr>
<tr>
<td>Standard Deviation</td>
</tr>
<tr>
<td>Sample Variance</td>
</tr>
<tr>
<td>Kurtosis</td>
</tr>
<tr>
<td>Skewness</td>
</tr>
<tr>
<td>Range</td>
</tr>
<tr>
<td>Minimum</td>
</tr>
<tr>
<td>Maximum</td>
</tr>
<tr>
<td>Sum</td>
</tr>
<tr>
<td>Count</td>
</tr>
<tr>
<td>Largest(10)</td>
</tr>
<tr>
<td>Smallest(10)</td>
</tr>
<tr>
<td>Confidence Level(95.0%)</td>
</tr>
</tbody>
</table>

Table 10: Comparison of the effect that the choice of counsel will make on plaintiff’s with a weak or frivolous case.

Without going into too much detail, we can clearly see the overall effect that having a large firm represent you will have. Overall it can be seen that if you approach a large firm despite
having a weak or frivolous claim, you can expect an average settlement value of R859 933.20 as compared to R194.89 if you approach some other firm with a weak or frivolous claim.

The same results can be seen in the table below that shows the counsel effect on plaintiff’s with a strong case.

<table>
<thead>
<tr>
<th></th>
<th>Large Firm</th>
<th>Other Firm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>12,095,768.71</td>
<td>Mean</td>
</tr>
<tr>
<td>Standard Error</td>
<td>341,895.85</td>
<td>Standard Error</td>
</tr>
<tr>
<td>Median</td>
<td>1,376,938.54</td>
<td>Median</td>
</tr>
<tr>
<td>Mode</td>
<td>-</td>
<td>Mode</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>20,510,901.59</td>
<td>Standard Deviation</td>
</tr>
<tr>
<td>Sample Variance</td>
<td>420,697,083,966,207.00</td>
<td>Sample Variance</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>4.973697363</td>
<td>Kurtosis</td>
</tr>
<tr>
<td>Skewness</td>
<td>2.18</td>
<td>Skewness</td>
</tr>
<tr>
<td>Range</td>
<td>132,628,989.39</td>
<td>Range</td>
</tr>
<tr>
<td>Minimum</td>
<td>-</td>
<td>Minimum</td>
</tr>
<tr>
<td>Maximum</td>
<td>132,628,989.39</td>
<td>Maximum</td>
</tr>
<tr>
<td>Sum</td>
<td>43532671598</td>
<td>Sum</td>
</tr>
<tr>
<td>Count</td>
<td>3,599.00</td>
<td>Count</td>
</tr>
<tr>
<td>Largest(10)</td>
<td>110,860,250.66</td>
<td>Largest(10)</td>
</tr>
<tr>
<td>Smallest(10)</td>
<td>-</td>
<td>Smallest(10)</td>
</tr>
<tr>
<td>Confidence Level(95.0%)</td>
<td>670,329.05</td>
<td>Confidence Level(95.0%)</td>
</tr>
</tbody>
</table>

Table 11: Comparison of the effect that the choice of counsel will make on plaintiff’s with a strong case.

5.5 Non-model Results

Several of the questions in the survey illustrate signalling events as well as other non-numerical results which are relevant to civil litigation, but were not contained in the model. Questions directed at the duration of proceedings focused on the longest and shortest time a matter has taken for counsel to achieve settlement. These results help see the effect of delays in a trial action.

Questions were asked regarding the cost of litigation in relation to amounts recovered. In the model the cost of litigation was not taken into account and the claim amount was assigned randomly for each iteration that the model ran. In the survey, the cost in relation to the settlement amount was relevant in determining if there is frivolous litigation in the South African system. The participants indicated that even where the cost of litigation will exceed the amount recovered, plaintiffs will sometimes still choose to proceed with the action, even when the action produces a negative outcome.
Questions were also asked whether or not certain claims were given priority. The results showed that higher claim values will get priority in almost all cases. The firms ranged in the number of matters they have at one time, from 20 to thousands. The firms also indicated that they would not turn a client away due to the firm working at capacity. In my opinion, this can also lead to many delays in the litigation process. If you were to approach a larger firm with a mid-sized matter, your claim would not get priority over larger matter, and the firm would not turn a client away, despite it being unable to assist due to the firm reaching capacity.

Other reasons for delays in trial actions and postponements were discussed in the survey. At each point in the process there seems to be a potential delay, and once the matter is heard in court, it has a high chance of being postponed due to lack of preparation by the parties.
6. Conclusions, Contributions and Future work

The theory section focused on offer and settlement in an engineering dispute by applying game theoretic arguments and signalling to decisions made and actions taken by the parties. In order to evaluate the theory, the conceptual model of a litigation game was drawn up. The survey was representative of the conceptual model, and once the results were gathered they were applied to a statistical model. Looking back at the theory, the model is consistent with many of the signals studied. For example, the model proves that a plaintiff, no matter how strong or weak his case is, will be more successful if he chooses to be represented by a large firm. In the theory section, this was a bluffing signal where a frivolous plaintiff would seek representation from a large firm, and by placing a large investment on the case, the defendant would be bluffed into offering a settlement value even in a frivolous situation.

The survey also highlighted a number of non-numerical points, which are relevant to the theory, but not represented in the statistical model. In the theory section reasons for delays were discussed. One of the most significant reasons encountered in the survey was law firms admitting to always taking on a new client, regardless of how many cases are active at present. The survey also found that preference is given to higher value claims.

The survey highlighted the effect of the signalling events discussed in the theory section. Questions surrounding these events such as the letter of demand, frivolous matters and settlement at various stages were used in the statistical model. The survey concluded that the theory was in line with practice with regards to settlement at an early stage and certain signalling events.

Once the survey was collected, aspects of the model were reconsidered, such as time values between the stages in the litigation process. The survey was able to provide more accurate data based on experience by practitioners in the courts. The survey also provided specific reasons for delays such as court files being lost which was not taken into account in the current model.

Despite every effort to collect data, only 12 surveys were used in the study. Future work will include a larger sample size to obtain more accurate results. The model can also include the cost of litigation, both time cost and economic cost for the parties in relation to the overall result. I would also like to further study the discovery period, focusing on what specific documents are exchanged and the signals those documents would send. For example if a party spends resources on obtaining an expert witness, it will increase the overall cost of the litigation, but would it increase the settlement in the end.

Future work will include a model which takes the cost of litigation into consideration, as well as the distinction between litigation in the Magistrate’s court and the High court. The survey will also include aspects regarding costs of litigation, as well as time costs of the parties. The model will also include a more specific time element so that the time cost of money may be calculated.
7. References


• O'Neil, B. (2009). *Bargaining with a Claims Structure: Possible Solutions to a Talmudic Division Problem*. (Department of Political Science). University of California, Los Angeles.


Appendix A

Survey presented to Law firms

Survey

Litigation in general

1. In your experience, what is the average duration of opposed trial action proceedings in the **High Court**, from the first instruction or consultation to finalisation (whether through abandonment of the proceedings by either party, withdrawal, settlement, judgement or judgement on appeal):

<table>
<thead>
<tr>
<th>1 year</th>
<th>18 months</th>
<th>2 years</th>
<th>3 years</th>
<th>&gt; 3 years</th>
</tr>
</thead>
</table>

2. In your experience, what is the average duration of opposed trial action proceedings in the **Magistrates Court**, from the first instruction or consultation to finalisation (whether through abandonment of the proceedings by either party, withdrawal, settlement, judgement or judgement on appeal):

<table>
<thead>
<tr>
<th>1 year</th>
<th>18 months</th>
<th>2 years</th>
<th>3 years</th>
<th>&gt; 3 years</th>
</tr>
</thead>
</table>

3. In defended trial actions which have proceeded to trial and judgement what has been the longest duration of a trial from inception to judgement that you have been involved in?

<table>
<thead>
<tr>
<th>2 years</th>
<th>3 years</th>
<th>4 years</th>
<th>5 years</th>
<th>&gt; 5 years</th>
</tr>
</thead>
</table>

4. In defended trial actions which have proceeded to trial and judgement what has been the shortest duration of a trial from inception to judgement that you have been involved in?

<table>
<thead>
<tr>
<th>6 months</th>
<th>1 year</th>
<th>18 months</th>
<th>2 years</th>
<th>3 years</th>
</tr>
</thead>
</table>

5. In defended trial actions which have culminated in execution of a judgement, what has been the longest duration of a trial from inception to execution of the judgement?

<table>
<thead>
<tr>
<th>2 years</th>
<th>3 years</th>
<th>3 years</th>
<th>5 years</th>
<th>&gt; 5 years</th>
</tr>
</thead>
</table>

6. In defended trial actions which have culminated in execution of a judgement, what has been the shortest duration of a trial from inception to execution of the judgement?

| 6 months | 1 year  | 18 months | 2 years  | 3 years  |
7. In your experience, how likely are each of the following factors be in deterring a plaintiff from pursuing legal remedies to recover a financial loss:
   a. the cost of litigation would be likely to exceed the amount recovered
      
       | Very unlikely | Unlikely | Not relevant | Likely | Very likely |
       |----------------|----------|--------------|--------|-------------|
   b. Even where the amount recovered would be likely to exceed the costs of litigation, the plaintiff does not have the financial means to litigate
      
       | Very unlikely | Unlikely | Not relevant | Likely | Very likely |
       |----------------|----------|--------------|--------|-------------|
   c. The nature of the defendant. For example, where the plaintiff is an individual with limited financial resources and the prospective defendant is a well-resourced corporation with the financial means to protract the litigation and cause the costs to become prohibitive, alternatively, where the defendant is a so-called “man of straw” who is unlikely to have sufficient assets to satisfy a judgement.
      
       | Very unlikely | Unlikely | Not relevant | Likely | Very likely |
       |----------------|----------|--------------|--------|-------------|
   d. Previous cases where such a defendant was involved, for example, if the defendant has a reputation to draw cases out until the plaintiff’s resources are exhausted
      
       | Very unlikely | Unlikely | Not relevant | Likely | Very likely |
       |----------------|----------|--------------|--------|-------------|
   e. If the plaintiff has the financial resources available, but does not have the time to litigate
      
       | Very unlikely | Unlikely | Not relevant | Likely | Very likely |
       |----------------|----------|--------------|--------|-------------|

Firm specific decisions

8. Where a prospective plaintiff has been advised not to pursue litigation because the costs may exceed the amount of the claim and/or because the litigation will be protracted, approximately what percentage of such clients nevertheless elect to proceed with legal action:

<table>
<thead>
<tr>
<th>&lt; 25%</th>
<th>Between 25% and 50%</th>
<th>Between 50% and 75%</th>
<th>&gt; 75%</th>
</tr>
</thead>
</table>
9. What is the average monetary value of the majority of claims instituted by your firm?

<table>
<thead>
<tr>
<th>Most of the claims are within the jurisdiction of the Magistrate’s Court (under R300 000)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Between R300 000 and R750 000</td>
<td></td>
</tr>
<tr>
<td>Between R750 000 and R3 million</td>
<td></td>
</tr>
<tr>
<td>&gt; R3 million</td>
<td></td>
</tr>
</tbody>
</table>

10. Is there a minimum value of claims that your firm deals with, and if yes, what is that value?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>

11. Does the amount of a claim dealt with by your firm determine or have any bearing on then priority given to that claim by the firm or the speed or urgency with which that claim is prosecuted by the firm?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>

12. Approximately how many litigious matters is your firm able to accept or deal with effectively at one time?

13. Would your firm turn away a prospective litigant on the basis that the firm’s professional staff, due to their existing workload, do not have capacity to deal effectively with the client’s case?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>

14. Does the firm work mainly on a:

<table>
<thead>
<tr>
<th>Fee Basis</th>
<th>Contingency Basis</th>
<th>Both</th>
</tr>
</thead>
</table>

15. If you elected fees or both in the previous question, what percentage of the clients are on a fee basis?

<table>
<thead>
<tr>
<th>&lt; 25%</th>
<th>Between 25% and 50%</th>
<th>Between 50% and 75%</th>
<th>&gt; 75%</th>
</tr>
</thead>
</table>
16. What is the average duration of the discovery process, from close of pleadings to receipt of the discovered documents, if the parties make a full disclosure of all relevant documents and no additional discovery is sought (for example in terms of Rule 35(3)):

<table>
<thead>
<tr>
<th>Duration</th>
<th>&lt; 2 months</th>
<th>Between 2 and 6 months</th>
<th>Between 6 months and one year</th>
<th>Between one and two years</th>
<th>&gt; 2 years</th>
</tr>
</thead>
</table>

17. In your experience, how likely are the following factors to contribute to the delay in the finalisation of a trial actions:

a. Inadequate discovery by either or both parties

<table>
<thead>
<tr>
<th>Likelihood</th>
<th>Very unlikely</th>
<th>Unlikely</th>
<th>Not relevant</th>
<th>Likely</th>
<th>Very likely</th>
</tr>
</thead>
</table>

b. Delay in the allocation of trial dates

<table>
<thead>
<tr>
<th>Likelihood</th>
<th>Very unlikely</th>
<th>Unlikely</th>
<th>Not relevant</th>
<th>Likely</th>
<th>Very likely</th>
</tr>
</thead>
</table>

c. Delay in the continuation of part heard trials

<table>
<thead>
<tr>
<th>Likelihood</th>
<th>Very unlikely</th>
<th>Unlikely</th>
<th>Not relevant</th>
<th>Likely</th>
<th>Very likely</th>
</tr>
</thead>
</table>

d. Postponements sought by either party

<table>
<thead>
<tr>
<th>Likelihood</th>
<th>Very unlikely</th>
<th>Unlikely</th>
<th>Not relevant</th>
<th>Likely</th>
<th>Very likely</th>
</tr>
</thead>
</table>

e. Amendment of pleadings by either party

<table>
<thead>
<tr>
<th>Likelihood</th>
<th>Very unlikely</th>
<th>Unlikely</th>
<th>Not relevant</th>
<th>Likely</th>
<th>Very likely</th>
</tr>
</thead>
</table>

f. Delays in the handing down of judgements

<table>
<thead>
<tr>
<th>Likelihood</th>
<th>Very unlikely</th>
<th>Unlikely</th>
<th>Not relevant</th>
<th>Likely</th>
<th>Very likely</th>
</tr>
</thead>
</table>

g. Other

__________________________________________________________________________

__________________________________________________________________________
18. In your experience, what percentage of claims are postponed at the first trial date

<table>
<thead>
<tr>
<th></th>
<th>&lt; 25%</th>
<th>Between 25% and 50%</th>
<th>Between 50% and 75%</th>
<th>&gt; 75%</th>
</tr>
</thead>
</table>

19. How many postponements occur before the matter is heard?

<table>
<thead>
<tr>
<th></th>
<th>One</th>
<th>Two</th>
<th>Three</th>
<th>Four</th>
<th>&gt; Four</th>
</tr>
</thead>
</table>

20. What percentage of claims settle after the letter of demand?

<table>
<thead>
<tr>
<th></th>
<th>&lt; 25%</th>
<th>Between 25% and 50%</th>
<th>Between 50% and 75%</th>
<th>&gt; 75%</th>
</tr>
</thead>
</table>

21. What percentage of claims settle after the summons has been delivered?

<table>
<thead>
<tr>
<th></th>
<th>&lt; 25%</th>
<th>Between 25% and 50%</th>
<th>Between 50% and 75%</th>
<th>&gt; 75%</th>
</tr>
</thead>
</table>

22. What percentage of claims settle after completion of the discovery process, but prior to trial?

<table>
<thead>
<tr>
<th></th>
<th>&lt; 25%</th>
<th>Between 25% and 50%</th>
<th>Between 50% and 75%</th>
<th>&gt; 75%</th>
</tr>
</thead>
</table>

23. What percentage of claims settle less than one month before trial

<table>
<thead>
<tr>
<th></th>
<th>&lt; 25%</th>
<th>Between 25% and 50%</th>
<th>Between 50% and 75%</th>
<th>&gt; 75%</th>
</tr>
</thead>
</table>

24. What percentage of litigants are cooperative, deliver the correct documents at the correct time

<table>
<thead>
<tr>
<th></th>
<th>&lt; 25%</th>
<th>Between 25% and 50%</th>
<th>Between 50% and 75%</th>
<th>&gt; 75%</th>
</tr>
</thead>
</table>
25. From the point of view of the defendant, does the nature of the plaintiff have an impact on the offer made? For example, if the plaintiff is an individual or a firm

| Yes | No |
--- | --- |

26. Are there certain “acceptable” offers in specific cases, or is each offer case specific

| Yes | No |
--- | --- |

27. If you answered YES in the previous question, what are those “acceptable” offers?

28. How do the following signals affect an offer made by a defendant?

   a. If the party instituting the action is an individual rather than a firm

      | Increase the potential offer | Decrease the potential offer | The defendant remains indifferent |
      --- | --- | --- |

   b. If the party who is initiating the claim approaches a larger firm where it can be assumed that the plaintiff is paying fees on a contingency basis

      | Increase the potential offer | Decrease the potential offer | The defendant remains indifferent |
      --- | --- | --- |

   c. If the plaintiff makes use of expert witnesses

      | Increase the potential offer | Decrease the potential offer | The defendant remains indifferent |
      --- | --- | --- |

29. Does the legal system allow for spurious or unfounded litigation?

| Yes | No |
--- | --- |
30. Can a plaintiff whose claim lacks merit nevertheless extract a settlement from a defendant purely due to the cost and inconvenience inherent in litigation?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
</table>

31. If so, in your opinion what percentage of claims are spurious / unfounded?

<table>
<thead>
<tr>
<th>&lt; 25%</th>
<th>Between 25% and 50%</th>
<th>Between 50% and 75%</th>
<th>&gt; 75%</th>
</tr>
</thead>
</table>