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The introduction of an appeals court in Dutch tax litigation

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Abstract:

Since January 1, 2005, the Dutch tax litigation comprises an appeals court. Before 2005, it had but one court of instance. That means that now, after a court of first instance has given its verdict in a tax dispute, an unsatisfied party may appeal to a higher instance, where this was impossible before. In this paper we investigate which consequences introducing an appeals court has for the way tax payers and the tax administration solve their disputes. We focus on the following questions. Are more or less tax payers willing to go to court to solve the dispute? Is it more or less difficult for parties to agree upon a settlement? Which appeal rate can we expect? What is the role of trust in the courts in the answers to the questions above?

JEL classification: K41

1 Introduction

In the Netherlands, tax payers who dispute their tax assessment first go through the objection procedure under the auspices of the tax administration itself. If at the end of that procedure the final assessment is still disputed, the tax payer may go to court. Before January 1, 2005 the tax payer had to bring his case to the 'Gerechtshof'. In the Netherlands, this was the only instance which considered the substantive merits of the case. Hence, neither side could appeal the judgment of the court on the grounds that the court misjudged the facts.

Since January 1, 2005, such disputes are first brought to a 'Rechtbank'. This court also considers the substantive arguments. After its verdict, parties now do have the option to appeal on substantive arguments, namely to the 'Gerechtshof'.

The possibility to appeal increases the number of options open to the players. Whereas before 2005 the dispute would stop after the verdict of the first trial, now the dispute may continue. The option to appeal can be an advantage if the first trial is lost. But it can also be a disadvantage if the first trial is won but the other party does not give up. Moreover if players go to court for the second time, they face additional costs.

The goal of this paper is to gain insight in the consequences of the introduction of an appeals court for the choices made by the tax payer and the tax administration with regard to ending the dispute. We are especially interested in the following questions:

1. Are tax payers more or less willing to go to court over the dispute?
2. Are players more or less likely to settle their dispute?
3. To what degree will players appeal the decision of the court of first instance?
4. How does the confidence society has in the courts affect the answers to the questions above?

There seems to be no economic literature in which the decision to go to court in the first instance is modeled together with the possibility to appeal. The papers who study the appeals process focus on the internal organization and dynamics of the judicial system, not on the choices by the parties in the dispute. For example, Shavell (1995) investigates how the judiciary should be arranged in order to minimize the combined costs of a mistake in the last verdict and the legal costs to all parties. He finds that a court of second instance can be beneficial, if the court of second instance gets relatively more means so that it is more reliable than the court of first instance, parties get the option to appeal or not, and the proper (dis)incentives to appeal, via court fees or subsidies, are in place. Spitzer and Talley (2000) analyze the policy choices that the higher court could make in reviewing verdicts of lower courts when lower courts may not only make mistakes, but may also have an ideological bias. Daughety and Reinganum (1999 and 2000) analyze how later verdicts in a case are affected if the information contained in the earlier verdicts and the decisions to appeal are taken into account.

In this paper we look at the connection of the courts in first and second instance from the other side, namely from the perspective of the parties in the dispute. How is the decision to go to court of first instance affected if players may appeal its verdict? The paper is organized as follows. In Section 2 we introduce two models: model OLD and model NEW. OLD represents the old situation, in which no appeal is possible. NEW represents the new situation, where players can appeal the decision of the court of first instance. Section 3 discusses model OLD briefly, as it is well-known in the literature. Section 4 analyzes how NEW differs from OLD. This analysis continues in Section 5, where we see how the outcomes are affected if players learn about their chances in the court of second instance from the verdict in first instance. In this section we also discuss the role of the confidence players have in the courts. Section 6 puts our results in a broader context, where we pay

attention to some aspects outside the scope of our model. Finally, Section 7 summarizes the conclusions.

2 The Model

There are two players[1], the tax payer (P) and the tax administration (A). Before, P received a tax assessment from A. Disagreeing with the assessment of A, P objected. At the end of the objection procedure, however, P still feels that the final assessment is too high, say by an amount Y. Hence there remains a conflict between A and P. Now each player chooses its strategy to resolve this dispute. The options to the players are given in the game tree of Figure 1.

We distinguish two stages in the game. Stage 1, reflecting the old situation, is the left part of Figure 1, which ends with the verdict of the court of first instance. Model OLD consists of this first stage only. Stage 2 starts after the verdict of the court of first instance. It can be partitioned into two subgames: Part 2P, if player P won the first trial, and Part 2A if player A won the first trial. Stage 2 reflects the additional options after introducing the additional instance. Model NEW comprises both stages. The relevant stage or part of the model is indicated by subscript g. When only the stages as such are relevant, $g \in \{1, 2\}$; whenever it is necessary to make a distinction between the two parts of Stage 2, $g \in \{1, 2P, 2A\}$.

In each part of the model players first have the option to settle (S) or not settle (NS). If the players settle, they agree on the amount (denoted by SA_g) which P should pay to A. After that the game ends. If not, the player who is unhappy with the current decision (the *unsatisfied player*)[2], say player i, may go to court (C) or give up (G). If i gives up, the game ends and the current decision is implemented. If i does go to court, he pays court fee f_g^i, and each player j pays his legal costs c_g^j. If player i wins that trial, the court fee for this trial is refunded. If the last trial before the game ends is won by player P, then A is ordered for costs, that is, A has to refund part[3] of the legal costs of P. This refund equals q_1 if the players only went to the court of first instance, and it equals $q_1 + q_2$ if the players went to the appeals court too.

Let π^i denote the payoff to player i. Further, let p_g^i be the estimated probability by i of winning the trial in Part g, and $E^i(\pi_g^i)$ his expected value of that trial. The true probability of i winning a trial is not known.
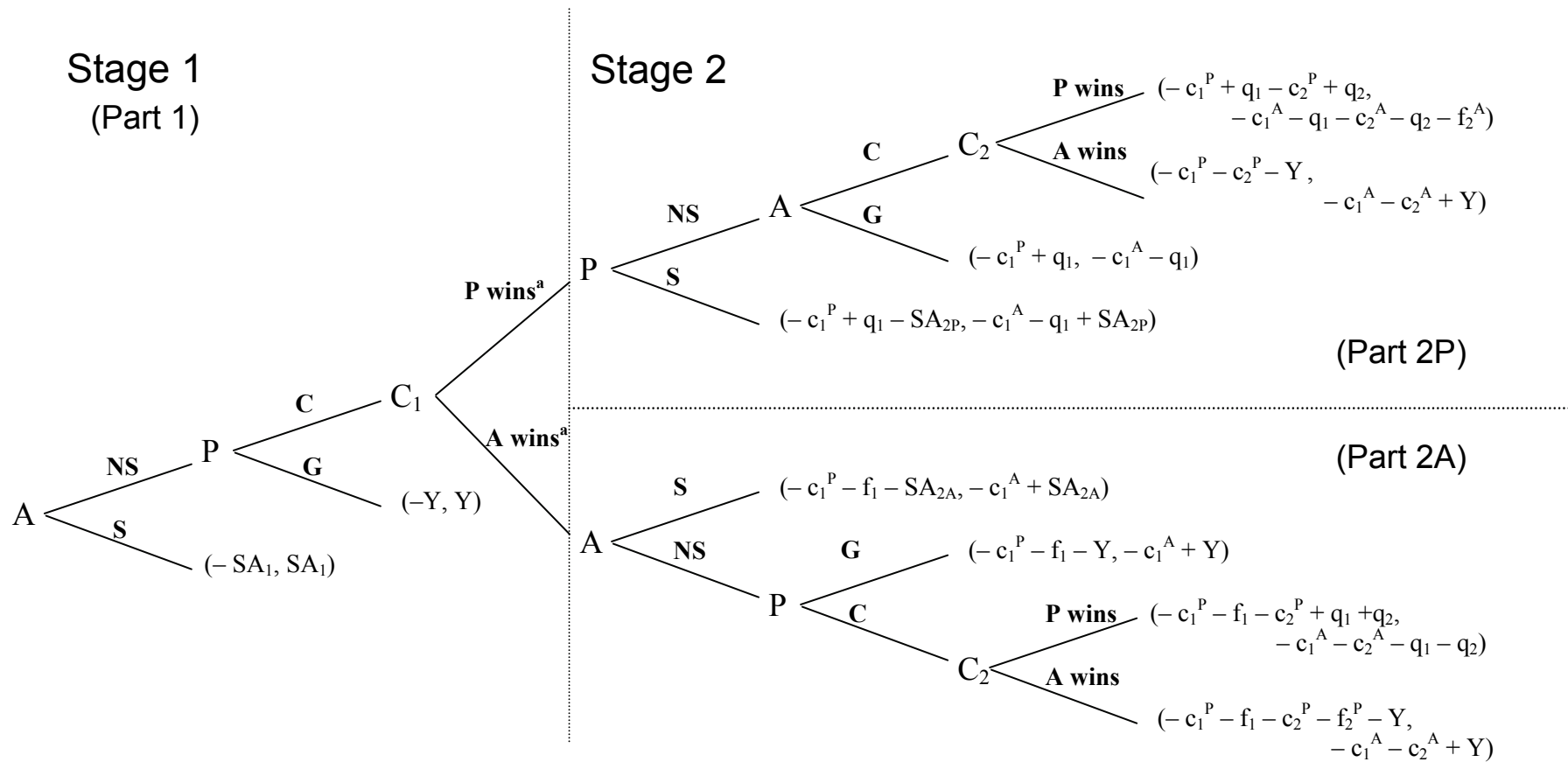
We assume that there is no breakdown in bargaining if the bargaining set is non-empty: provided that the unsatisfied player has a credible threat of going to court and that there exists some settlement amount which both players prefer to another trial, then such a settlement will be reached. As such, we can model the decision of accepting the settlement or not as the decision of the satisfied player only. Specifically, in our numerical analysis we assume that the settlement amount lies halfway between the lower and upper bound of the bargaining set. This can be expected if both players have equal bargaining power.

Finally, in model OLD the strategy for player P is given by $s^P \in \{G, C\}$; and the strategy for player A by $s^A \in \{S, NS\}$. In model NEW the strategy for player P, s^P, is given by the triplet $(s_1^P, s_{2P}^P, s_{2A}^P)$, where $s_1^P, s_{2A}^P \in \{G, C\}$ and $s_{2P}^P \in \{S, NS\}$; and the strategy for player A by $(s_1^A, s_{2P}^A, s_{2A}^A)$, where $s_1^A, s_{2A}^A \in \{S, NS\}$ and $s_{2P}^A \in \{G, C\}$.

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[1] To keep the results tractable, we assume that the players are risk neutral.
[2] So player P in Stage 1 and Part 2A, and player A in Part 2P.
[3] In the Netherlands, refunds of legal costs are based on a point system. Generally the amount refunded is (substantially) less than the actual legal costs incurred. Moreover, although it is in principle possible that tax payers are ordered to refund the legal costs made by the tax administration, this only rarely happens.

Stage 1
(Part 1)

Stage 2

Part 2P and Part 2A game tree content:

Part 2P:

P wins[a] → P

NS → A
- C → C_2
  - P wins: $(-c_1^P + q_1 - c_2^P + q_2,\ -c_1^A - q_1 - c_2^A - q_2 - f_2^A)$
  - A wins: $(-c_1^P - c_2^P - Y,\ -c_1^A - c_2^A + Y)$
- G: $(-c_1^P + q_1,\ -c_1^A - q_1)$

S: $(-c_1^P + q_1 - SA_{2P},\ -c_1^A - q_1 + SA_{2P})$

(Part 2P)

Part 2A:

A wins[a] → A

S: $(-c_1^P - f_1 - SA_{2A},\ -c_1^A + SA_{2A})$

NS → P
- G: $(-c_1^P - f_1 - Y,\ -c_1^A + Y)$
- C → C_2
  - P wins: $(-c_1^P - f_1 - c_2^P + q_1 + q_2,\ -c_1^A - c_2^A - q_1 - q_2)$
  - A wins: $(-c_1^P - f_1 - c_2^P - f_2^P - Y,\ -c_1^A - c_2^A + Y)$

(Part 2A)

Stage 1:

A
- NS → P
  - C → C_1
  - G: $(-Y, Y)$
- S: $(-SA_1, SA_1)$

C_1 → P wins[a] / A wins[a]

Figuur 1. The game tree

[a] In model OLD, the game ends here. The payoffs to the parties are then equal to those in model NEW if in Stage 2 the unsatisfied player gives up.

3 Model OLD

Model OLD is just an application of the well-known divergent expectations (DE) model from the literature[4]. Therefore we will discuss this model and its results only briefly.

Note first that

$$E^P(\pi_1^P) = -p_1^P (c_1^P - q_1) - (1 - p_1^P)(Y + f_1^P + c_1^P) \tag{2}$$

and

$$E^A(\pi_1^A) = p_1^A (Y - c_1^A) + (1 - p_1^A)(-c_1^A - q_1) \tag{3}$$

Therefore in any subgame perfect equilibrium, $s^P = C$ if

$$p_1^P > (f_1^P + c_1^P) / (Y + f_1^P + q_1),$$

and $s^P = G$ if

$$p_1^P \leq (f_1^P + c_1^P) / (Y + f_1^P + q_1). \tag{4}$$

So P will give up and accept the final assessment of A, unless P has sufficient faith in his chances to win the trial (*i.e.* if p_1^P is high enough). Note that P will not have a credible threat, regardless of his estimated chances in court, if $Y + q_1 < c_1^P$, that is: if the refund of legal costs does not cover the real legal costs, and Y is small enough.

Obviously, A will not agree to settle if P is not willing to go to court. However, if P is willing to go to court, a settlement may still be impossible. The minimum A demands equals his expected benefit of going to court $E^A(\pi_1^A)$, while the maximum P is willing to pay is equal to his expected loss of going to court, namely $E^P(\pi_1^P)$. Hence, a settlement is possible only if

$$p_1^A (Y - c_1^A) + (1 - p_1^A)(-c_1^A - q_1) \leq p_1^P (c_1^P - q_1) + (1 - p_1^P)(Y + f_1^P + c_1^P). \tag{5}$$

Rearranging Condition (5) yields

$$(p_1^P + p_1^A - 1)(Y + q_1) \leq c_1^P + c_1^A + (1 - p_1^P) f_1^P. \tag{6}$$

The right-hand side (RHS) equals the costs which parties can save by not going to trial. The left-hand side (LHS) equals the amount by which their joint claim exceeds the amount to be divided ($Y + q_1$). Thus if the LHS is not larger than the RHS, then the costs of going to court outweigh the sum of the perceived benefits of going to trial, and players will choose to settle. This is always true if $p_1^P + p_1^A \leq 1$. However, if players are *jointly optimistic*, defined as $p_1^P + p_1^A > 1$, then it can occur that their joint claim on the money exceeds the costs of trial. In that case, players will go to court.

Thus the subgame perfect equilibrium is:
- (G, NS) if Condition (4) holds,
- (C, S)   if Condition (4) does not hold, but Condition (5) does, and
- (C, NS) if Conditions (4) and (5) are both violated.

Figure 2 shows how, given some set of parameters, the subgame perfect strategies depend on the beliefs of the players. For each point in area G, P will give up. For each point in area S the players will settle, and for the points in area C the players will go to court.

From Condition (4) it is clear that the border between G and S is vertical, because the willingness of P to go to court depends only on his own estimate of his chances in court. Moreover, we see that the border lies more to the right the lower Y and q_1 are, and the higher f_1^P or c_1^P are.

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[4] See for example Shavell (1982).
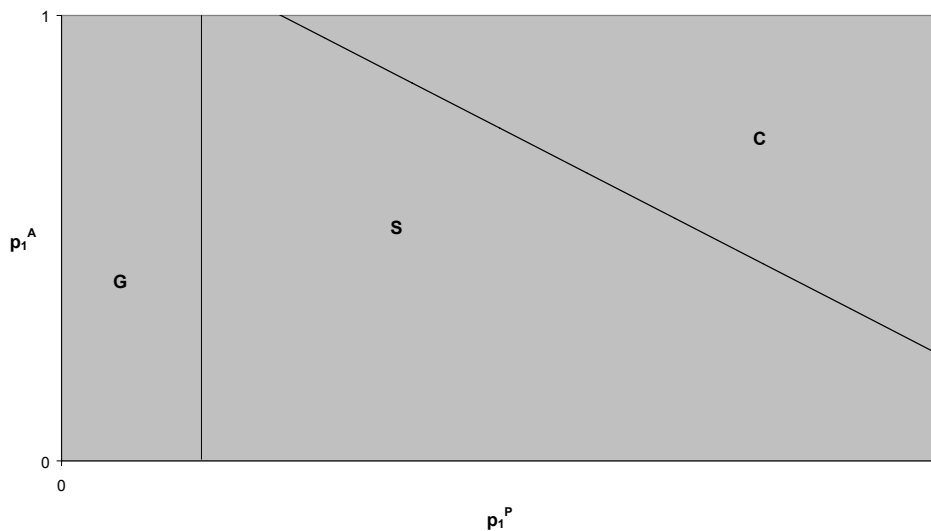
Figure 2. Model OLD summarized

Condition (5) shows that the border between S and C is downward sloping because the players will go to court only if $p_1^P + p_1^A$ is large enough. Moreover, we see that the border shifts to the right if Y or q_1 decreases (because the joint claim becomes lower), or if c_1^P, c_1^A or f_1^P increases (because the total costs of trial become higher).

Summarizing, the conclusions for model OLD are the following:
1. Parties will go to court only if they are jointly optimistic, so if $p_1^P + p_1^A > 1$.
2. The probability of a trial increases in:
    − the degree of joint optimism,
    − the disputed amount Y,
    − the refund of legal costs (q_1) if P wins,
   and decreases in:
    − the costs related to a legal procedure: c_1^P, c_1^A and/or f_1^P.
3. When the refund of legal costs is incomplete, player P has no credible threat if the disputed amount Y is sufficiently small. Such small disputes will never go to court.

4 Model NEW

In this section we investigate the effects of the introduction of an appeals court. Whereas in model OLD the verdict of the court of first instance was automatically executed, now the player who lost in first instance may appeal the verdict at the court of second instance. The resulting model, model NEW, also includes the right half of Figure 1 (Stage 2).

Clearly, as a result of the additional options to the players in NEW, the expected benefit of going to court in Stage 1 may differ from that in OLD. Therefore the optimal strategies in NEW for Stage 1 can differ from those in OLD.

Moreover, it is quite possible that the confidence players have in their case is affected by the trial. The trial may for example uncover hitherto unknown information, and the judgment of the court itself will often carry some weight too.

We start the analysis by studying the decisions of players during Stage 2 in Section 4.1. In Section 4.2 we study the consequences on Stage 1 of the model. Sections 4.3 and 4.4 compare models OLD and NEW. In this comparison we assume that the beliefs of the players do not change during the conflict, thus $p_1^P = p_{2P}^P = p_{2A}^P = p^P$, and $p_1^A = p_{2P}^A = p_{2A}^A = p^A$. In Section 5 we allow players to learn from the verdict by the first court. There we will also see how the players' strategies are affected by the trust they have in the courts.

4.1 Stage Two: The decision to appeal

After the verdict by the first court, players may (again) choose to settle or, if not, to appeal. In this section we derive under what conditions players will settle, go to the court of second instance or abide by the standing verdict.

Suppose first that P won the first trial. Analogous to Conditions (4) and (5), we know that A will give up if

$$p_2^A \le (f_2^A + c_2^A + q_2) / (Y + f_2^A + q_1 + q_2). \tag{4P}$$

If A will indeed give up, player P will refuse to settle. If A is willing to appeal, the players may decide to settle. That will occur if the costs of a second trial are not exceeded by the amount by which the players jointly overestimate their expected benefit in the appeals court. Specifically:

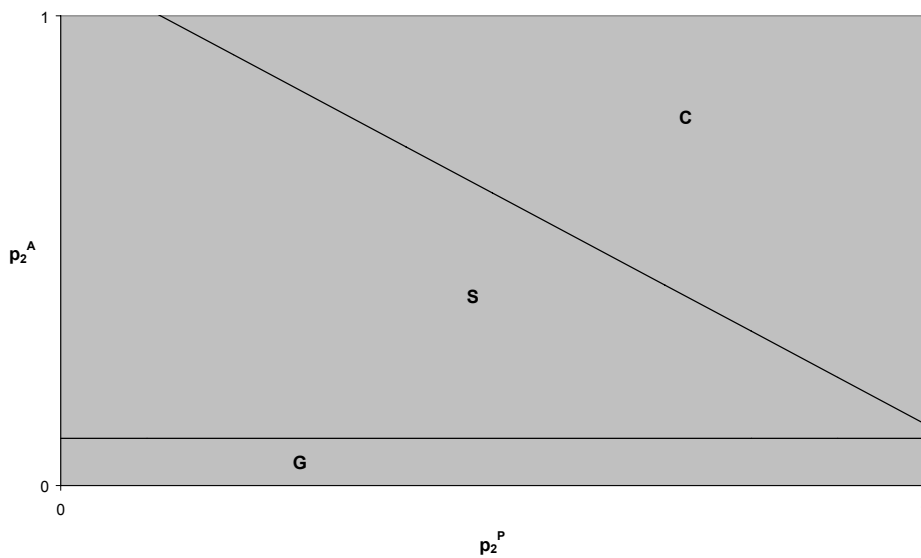$$(p_2^P + p_2^A - 1)(Y + q_1 + q_2) \le c_2^P + c_2^A + (1 - p_2^A) f_2^A. \tag{6P}$$
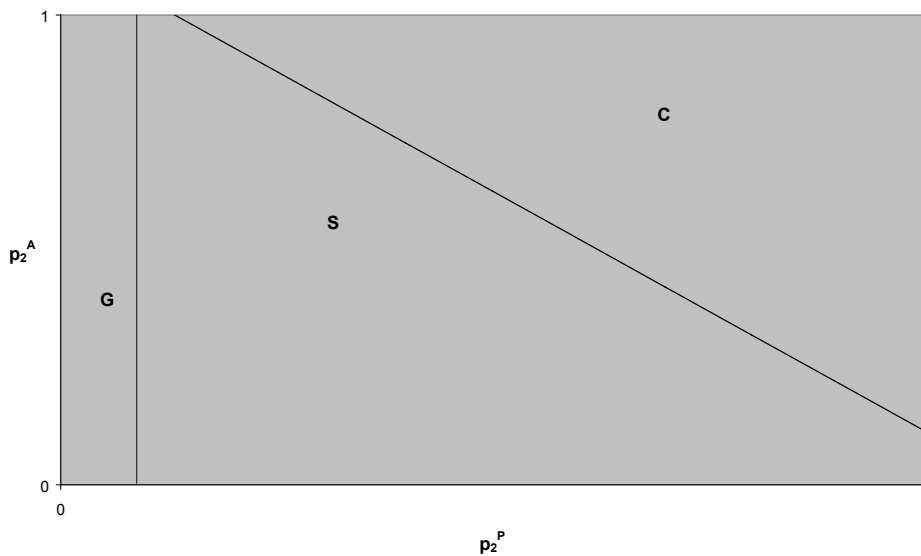

Figure 3a. Part 2P summarized

Figure 3b. Part 2A summarized

If A won the first trial, the corresponding conditions are

$$p_2^P \le (f_2^P + c_2^P) / (Y + f_2^P + q_1 + q_2). \tag{4A}$$

$$(p_2^P + p_2^A - 1)(Y + q_1 + q_2) \le c_2^P + c_2^A + (1 - p_2^P) f_2^P. \tag{6A}$$

We represent these conditions graphically in Figures 3a (for Part 2P) and 3b (Part 2A). The areas are again denoted by G (give up), S (settle), and C (going to court).

Clearly, before the game reaches the second stage, players have to go to the court of first instance. Suppose that during the first stage players do not take the right to appeal into consideration. So Section 3 holds for the first stage decision making. Suppose also that for each players the estimated probability of winning the trial (if any) is the same during Stage 2 as it is during Stage 1. Then players will always appeal the verdict of the court of first instance if Conditions (6P) and (6A) are less strict than Condition (6).

In general, it is unclear whether that is the case. On the one hand, the amount disputed has increased from $Y + q_1$ to $Y + q_1 + q_2$, which makes going to court more attractive. On the other hand, the (additional) costs of a trial are different. In the second stage they are either $c_2^P + c_2^A + (1 - p_2^A) f_2^A$ or $c_2^P + c_2^A + (1 - p_2^P) f_2^P$, while in the first stage they are $c_1^P + c_1^A + (1 - p_1^P) f_1^P$.

However, conversations with Dutch tax advisers suggest that the following stylized facts apply in the Dutch case. First, court fees in tax cases are small compared to the legal costs and these court fees are not much larger in the second stage of the model than in the first stage. Second, the legal costs in an appeal are substantially smaller than in the first trial, because the case has already been prepared and defended. So commonly, the total costs to the players of the second trial will be lower than those of the first trial.

Taking these stylized facts into account, we see that in the second stage the reasons to go to court are stronger than in the first stage. Therefore the losing player will always appeal.

Summarizing, the analysis of the appeals decision yields the following conclusions.
1. As in the first stage, players will go to court only if they are jointly optimistic.
2. On the basis of our estimates on the legal costs in the second stage, relative to those in the first stage, and assuming that the expected probability of winning is the same in both stages of the game, the appeal rate will equal one.

## 4.2 Stage One: The decision to go to the court of first instance

Of course, players in first stage decision making do (eventually) recognize that the game does not end after the first trial. This knowledge affects the net benefits which they expect from a trial, and may therefore affect their actions in the first stage. This is illustrated in this Section. Naturally, it now becomes relevant which result players would reach in the second stage, as it affects their expected benefit of going to court in the first stage, and therefore their behavior. For simplicity we assume that $p_{2P}^i = p_{2A}^i = p_2^i$ for $i = P, A$.

Figure 4 provides a graphic illustration[5]. Each area in it has a three letter code, where as before G means 'give up', S means 'settle' and C means 'go to court'. The second and third letters of each code refer to the outcome if players would go to court in the first stage and player P respectively player A would win that trial, *i.e.* Parts 2P and 2A of Stage 2. The first letter refers to the combination of players' choices in Stage 1.

Focus on the areas GCC, SCC and CCC. For these combinations of beliefs players know that if they go to court, there will follow an appeal trial for sure, regardless of which player looses. Knowing this, the expected payoff to player P to go to court is equal to

$$E^P(\pi_1^P) = -p_2^P (c_1^P + c_2^P - q_1 - q_2 + (1 - p_1^P) f_1^P)$$
$$- (1 - p_2^P)(Y + c_1^P + c_2^P + (1 - p_1^P)(f_1^P + f_2^P)) \tag{2I}$$

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[5] This figure is based on a Scenario 1, of Table 1 in Section 4.3, where $p_2^i = p_1^i = p^i$, for $i = P, A$.
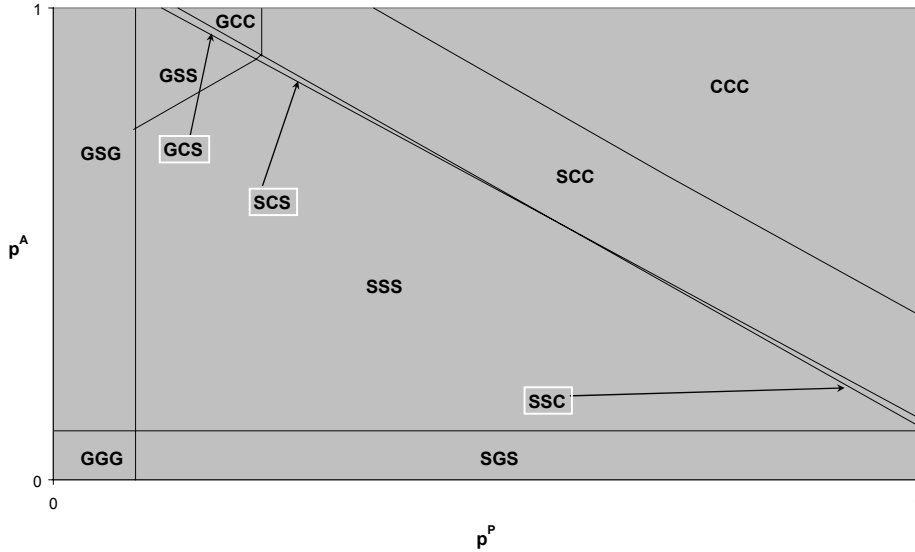
Figure 4. Model NEW, all three parts integrated

Player P is only willing to go to court if the expected costs are lower than paying the disputed amount. So, there exists[6] some value x such that P gives up if and only if $p_1^P \leq x$ (see the vertical line in Figure 4).

If P has a credible threat, then he may decide to settle. Analogous to Condition (6), a settlement will occur if

$$(p_1^P + p_1^A - 1)\,(Y + q_1 + q_2) \leq c_1^P + c_2^P + c_1^A$$
$$+ c_2^A + (1 - p_1^P)\,f_1^P + (1 - p_1^P)\,(1 - p_2^P)\,f_2^P + (1 - p_1^A)\,(1 - p_2^A)\,f_2^P. \tag{6I}$$

As in Condition (6), the RHS gives the expected costs of going to court when an appeal is certain. The LHS gives the amount by which the parties jointly overestimate the money that the final verdict will assign to them. At the border between SCC and CCC Condition (6I) holds with equality.

The other areas are derived in similar ways, and we can interpret them in a similar fashion. Consider for instance a point in the area SGS. The parameters there are such that player A will give up if he loses in the court of first instance. In contrast, if A wins the first trial, player P is willing to appeal the verdict and given this threat the players will negotiate a settlement. As a consequence of these A prefers to avoid a trial in first instance by offering an acceptable settlement to P.

4.3 The effects of introducing the court of second instance

It is clear that Conditions (2I) and (6I) depend on a large number of parameters, while at the same time they are quadratic in the beliefs of the players. Since the magnitude of the parameters relative to each other is analytically also unknown, it will be very difficult, if not impossible, to derive meaningful results in a purely analytical way.

Instead, we follow a numerical approach. In Table 1 we present 7 scenarios, constructed after conversations with Dutch tax advisors, which jointly should give a fairly representative insight in the relevant factors.

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In Scenario 0, the tax payer is an individual who will represent himself in court. In Scenarios 1 to 6 the tax payer is a firm that will hire professionals to represent it in court. We make two more assumptions, as is apparent from Table 1. First, we assume that the legal costs during an appeal are 50 percent of the legal costs during the first trial, for the case has

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[6] Note that if $Y + q_1 + q_2 \leq c_1^P + c_2^P + (1 - p_1^P)\,f_1^P$, then $x \geq 1$ and player P certainly gives up.

been prepared and argued before. Second, we assume that the refund of legal costs is the same for a trial in first instance as for a trial in second instance.

Table 1. Description of the Scenarios

#	Y	c_1^P	c_1^A	c_2^P	c_2^A	$q_1 = q_2$	f_1^P	f_2^P	f_2^A
0	1.000	200	2.000	100	1.000	20	37	103	414
1	20.000	3.000	2.000	1.500	1.000	800	276	414	414
2	20.000	3.000	3.000	1.500	1.500	800	276	414	414
3	20.000	8.000	3.000	4.000	1.500	800	276	414	414
4	20.000	8.000	3.000	4.000	1.500	1.200	276	414	414
5	100.000	8.000	3.000	4.000	1.500	800	276	414	414
6	1.000.000	50.000	4.000	25.000	2.000	1.200	276	414	414

We assume that the probability estimate of a player of winning a trial is constant. Specifically, $p_g^i = p_{g'}^i$ for all g, g' $\in$ {1, 2P, 2A} and i = P, A. Figure 5 shows the results of Scenario 1. The figures summarizing the results for scenarios 2 to 6 are similar and are shown in the appendix. Scenario 0 gives a different figure, which we will discuss in a moment. In these figures, the white lines give the results in model OLD, while the black lines give the results for model NEW. These black lines originate from Figure 2, where the areas with the same first letter are joint. The areas G and S give the belief coordinates for which during the first stage P will give up respectively the players will settle the dispute. For the coordinates in area C, the players will go to the court of first instance and, in the NEW situation, also to the appeals court.

Comparing the two models, we see that fewer disputes will be brought to court. The explanation is simple. Note first that, since an appeal is certain, the court proceedings will only end with a verdict of the court of second instance. Second, note that the disputed amount in both stages is similar, while the combined legal costs of two trials are substantially higher than after the first trial[7]. Therefore players have more incentives to settle in NEW than in OLD.
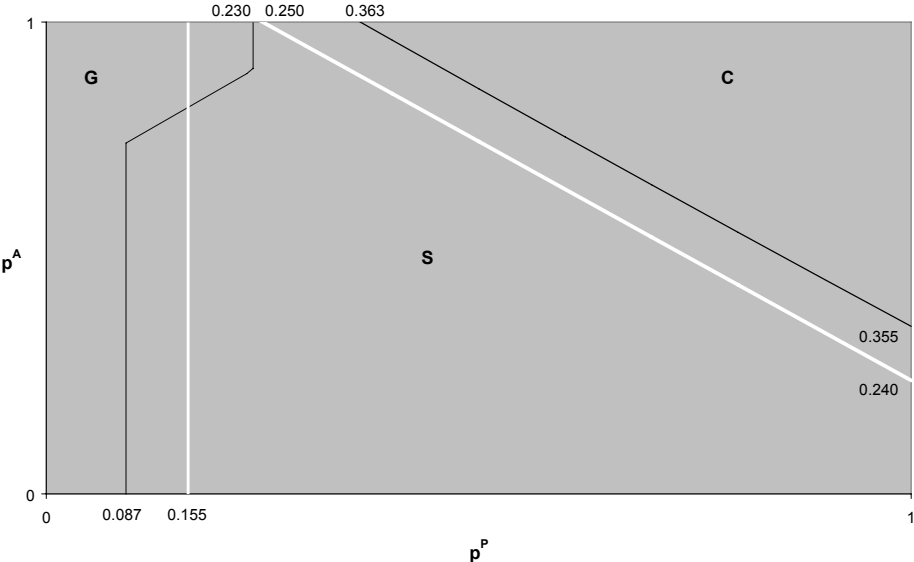
Figure 5. Scenario 1, model OLD (white) and model NEW (black)

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[7] Compare Conditions (5) and (5I)

A second difference between NEW and OLD is that the border between G and S is more to the left in NEW if A has little faith in its chances, while it is more to the right if A has much faith in its chances. The intuition is the following. If P has a credible threat in Stage 1, he also has a credible threat in Stage 2, because the additional costs of an appeals process are substantially lower, while the disputed amount has not changed much[8]. If A has little confidence, then P loses little by the right of A to appeal, for either A has not even a credible threat, or A has a relatively weak bargaining position so that P will obtain a favorable settlement. And if P loses the first trial, then he still gets a relatively favorable settlement. Hence, going to court is more appealing to P in NEW than in OLD. But it is also clear that as p^A increases, any settlement in the second stage becomes less favorable to P. So, from some point onwards, the minimum value of p^P such that P has a credible threat increases in p^A. This gives the upward sloping border. If p^A and p^P are sufficiently large, then an appeal is certain. In that case p^A does not affect the benefits which P expects from going to court. Hence, for p^A large enough, the border is vertical. This part of the border is to the right of the border in OLD, because the amount of legal costs which may be refunded by court order will typically not cover all of those costs. So, the expected costs associated with going to the first court and the certain appeal are higher than the costs of going to court in OLD. Hence, to have a credible threat P must have a stronger faith in his chances in model NEW than in model OLD if p^A is high.

Scenarios 2 to 6 reveal the same image as Scenario 1. The odd one out is Scenario 0, of which the results are depicted in Figure 6. It differs in the sense that the players will not go to trial, because the certain costs to A are larger than the disputed amount. Whether P can threaten credibly, still depends on the expected payoff from going to court. Moreover, in model NEW player P will sooner have a credible threat, as the relatively high legal costs of A ensure that A is loathe to use the option to appeal and that A has a weak bargaining position.

Summarizing, we can conclude for model NEW that:
1. The introduction of an appeals court leads to less trials in the first stage, thus the necessary degree of joint optimism becomes larger.
2. All trials in the first stage are followed by an appeal in the second stage.
3. It is uncertain whether tax payers who disagree with their tax assessment will more or less often give up. This depends on the actual distribution of the parties' estimated probabilities of winning.
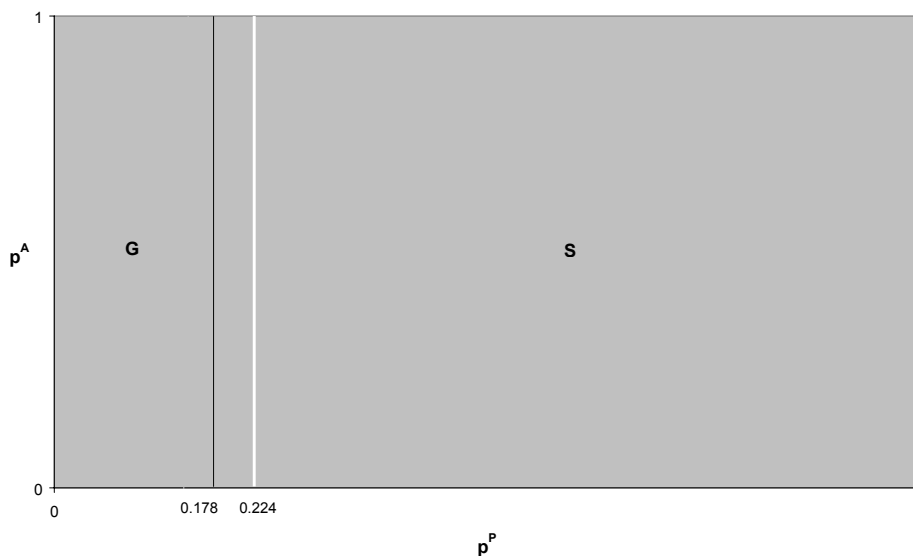

Figure 6. Scenario 0, model OLD (white) and model NEW (black)

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[8] Compare Conditions (2) and (2I).

4.4 How the variables affect the results.

By comparing the different scenarios we also gain insight into the roles of the other variables, apart from the combination of beliefs (p^P, p^A). The values of these other variables determine the positions of the border lines between the strategy profiles.

We first look at the effects on the credibility of player P not giving up. In model OLD, these threats were more likely to be credible when Y and q_1 increased and the legal costs f_1 and c_1^P decreased. In model NEW the variables related to the second stage can play a role too.

If one of the possible outcomes of going to court in Stage 1 is a settlement in the second stage, then P has more incentives to go to court if this settlement is more favorable to him. Any settlement in the second stage becomes more favorable to P if c_2^P and (if applicable) f_2^P are lower and c_2^A, q_2 and (if applicable) f_2^A are higher, because expected costs to P weaken his bargaining position, while expected costs to A strengthen it.

Clearly it is also relevant whether A is willing to appeal after losing in the first stage. Therefore, if a small *increase* in Y or q_1, or a small decrease in c_2^A, f_2^A and q_2 gives A a credible threat, where A did not have one before, the incentives of P to go to court in the first stage *decrease*. On the other hand, an increase in Y or q_1 may give P a credible threat in stage 2, where P had none before, just as a decrease in c_2^P and f_2^P and an increase in q_2 would. In that case P needs less faith in his case to threaten credibly in the first stage.

Finally, if one of the verdicts in the first stage leads to an appeal in the second, the expected benefits to player P of going to court in the first stage depend positively on the expected benefits of that appeal.

Summarizing, we see that generally an increase in Y, q_1, q_2, c_2^A and f_2^A and a decrease in c_1^P, f_1^P, c_2^P and f_2^P give P more incentives to go to court, if a settlement is not obtained. This is also apparent by comparing Scenarios 1 and 2 (for c_1^A and c_2^A), 2 and 3 (for c_1^P and c_2^P), 3 and 4 (for q_1 and q_2), and 3 and 5 (for Y).

These scenarios show with respect to the decision whether to go to court or to settle, that – as one would expect, see Condition (6I) – players are less likely to go to court if the disputed amount Y and (possible) refunds q are smaller, and the costs related to going to any court, c and f, are higher.

5 Learning from the first trial

Before, the chances which the players gave themselves in the second stage of the game were unaffected by the trial in the first stage. This is unlikely for a couple of reasons. First, during the trial in the first stage both players have to present the information on which they base their case. Hence if players differed in opinion because of asymmetric information, at least one player will change his opinion. Second, the verdict of the judge, who is an expert in the field, will generally carry some weight too.

In this section we analyze what changes if we allow players to adjust their beliefs according to the verdict of the first court, or, in other words, if players learn from the court's verdict. We shall see that this may lead to appeal rates of less than one, whereas they were equal to one in Section 4.

In Section 5.1, we expand the model to incorporate this learning process. Section 5.2 discusses the special case in which the players trust the courts perfectly. Section 5.3 discusses the general relation between beliefs in the two stages when this trust is imperfect. In other words, players believe that courts can make mistakes. In Sections 5.4 and 5.5 we apply the case of imperfect trust to the setting of tax disputes. In Section 5.4 we assume that players are myopic. So during the first stage they are not aware that the verdict of the first court will affect their own judgments. In Section 5.5 we study the case of far-sighted players, who at the start of the game are fully aware what their future beliefs will be at any point in the game tree.

5.1 Dissecting the estimated probability of winning

In case of a dispute brought to trial, a player can win the case in two ways. First, he may be right, and the court's verdict is correct. Second, the player may be wrong, but the court makes a mistake.

Hence, in Stage 1 of the game, the probability with which player i thinks he wins a trial (p_1^i) can be dissected into two elements: his estimate of the probability that he is right (ρ_1^i, where $0 \leq \rho_1^i \leq 1$), and his confidence in the court of first instance[9] (r_1^i, where $0 \leq r_1^i \leq 1$). So in Part g, player i expects that his chances of winning in court are given by

$$p_1^i = \rho_1^i \, r_1^i + (1 - \rho_1^i)(1 - r_1^i). \tag{7}$$

We assume that the confidence in every court is socially determined, and not individually. Therefore $r_g^i = r_g$ for any player i and for both stages of the game.

There are two reasons why for instance p_{2P}^i may differ from p_1^i. First, the confidence in the appeals court may differ from the confidence in the first court. Second, after the verdict of the first court player i may change his belief on the probability that he is right.

With respect to the first reason, we note that it is credible that society puts more trust in the appeals courts than in the district courts[10], because judges in the appeals courts are typically more experienced, appeals courts take more time for the case, and whereas the first court may consist of a single judge, appeals courts consist of several judges. Therefore we assume that $r_2 \geq r_1$.

With respect to the second reason, note that whenever $r_1 \neq \frac{1}{2}$ the verdict is effectively a signal of which player is right. In this section players will interpret this signal in a way which is consistent with both their initial belief (their prior) and the confidence which they have in the court's verdict. More specifically we assume that players update their beliefs according to Bayes' rule.

Formally, if player i won the first trial, he believes that the probability with which he is right is equal to[11]

$$\rho_{2+}^i = \rho_1^i r_1 / (\rho_1^i r_1 + (1 - \rho_1^i)(1 - r_1)). \tag{8+}$$

Similarly, if i lost the first trial, he believes that the probability with which he is right is equal to

$$\rho_{2-}^i = \rho_1^i (1 - r_1) / (\rho_1^i (1 - r_1) + (1 - \rho_1^i) r_1). \tag{8-}$$

Analogous to Eq. (7) and given the adjusted beliefs (ρ_{2+}^i or ρ_{2-}^i) and the confidence in the appeals court (r_2), player i expects to win an appeal case with the following probability after having won respectively lost the first trial

$$p_{2+}^i = \rho_{2+}^i r_2 + (1 - \rho_{2+}^i)(1 - r_2) \tag{9+}$$

$$p_{2-}^i = \rho_{2-}^i r_2 + (1 - \rho_{2-}^i)(1 - r_2). \tag{9-}$$

In the rest of Section 5 we explore the consequences of players who update (learn) according to Bayes' rule.

5.2 Perfect confidence in the courts

We start with the special case in which the trust in every court is complete. So players believe that the court's verdict is the right one, i.e. $r_1 = r_2 = 1$.[12] If that is the case, then Eqs. (6) to (9-) can be simplified to $p_1^i = \rho_1^i$; $\rho_{2+}^i = 1$ and $\rho_{2-}^i = 0$; $p_{2+}^i = 1$, and $p_{2-}^i = 0$.

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[9] We define the (level of) confidence in a court as the probability with which that court is expected to judge correctly.

[10] This is consistent with Shavell (1995).

[11] The numerator is equal to the probability (estimated by player i) that player i is right *and* wins the first trial. The denominator gives his estimated probability of winning the first trial. The ratio therefore gives player i's estimate of the probability that he is right given that he won the first trial.

Thus players adopt in the second stage the verdict of the court of first instance. In this case, we can draw three conclusions, the first of which is:

1. The court's verdict will be executed, because – lacking a credible threat – the player who lost will give up.

The last two conclusions depend on whether players are myopic or far-sighted. During Stage 1, myopic players do not know that their beliefs in Stage 2 are affected by the outcome of the first trial. Far-sighted players however realize at the start of the conflict the full consequences of the decision by the court of first instance.

2. If the players are myopic, during the first stage they act conform the analysis in Section 4.3, for they expect that $p_2^i = p_1^i$. Of course, Conclusion 1 applies in the second stage.
3. If the players are far-sighted, they know that there will never be an appeal or a settlement after the first trial. Hence they act as if they are in model OLD (Section 3).

5.3 Imperfect confidence in the courts

We now consider the more realistic case, where the confidence that society has in the courts is limited. Courts fail sometimes, and players know that. On the other hand, we also assume that players trust that the verdict of the courts is more reliable than the flipping of a coin. Therefore we obtain that $\frac{1}{2} < r_1 \le r_2 < 1$.

In this section we analyze what these assumptions imply for the probabilities estimated by the players. We start by rewriting Eq. (7) as

$$p_1^i = (1 - r_1) + \rho_1^i (2 r_1 - 1). \tag{10}$$

Then from $\frac{1}{2} < r_1 < 1$ it immediately follows that
1. The estimate of player i of the probability of winning the first trial, p_1^i, is correlated positively with his estimate of the probability that he is right.
2. Therefore p_1^i is minimally equal to the probability with which the court is mistaken ($1 - r_1$), namely if $\rho_1^i = 0$, and maximally equal to the probability with which the court is right (r_1), namely if $\rho_1^i = 1$.
3. If $\rho_1^i < \frac{1}{2}$ then the possibility of a mistake by the court ensures that $p_1^i > \rho_1^i$, and if $\rho_1^i > \frac{1}{2}$ this probability of wrong verdicts ensures that $p_1^i < \rho_1^i$. Moreover, the difference between p_1^i and ρ_1^i increases in the probability of mistakes by the court.

Furthermore Eq. (10) implies that

$$(p_1^P + p_1^A - 1) = (2 r_1 - 1) (\rho_1^P + \rho_1^A - 1), \tag{11}$$

which yields us the following two results:
4. Players are jointly optimistic with respect to their chances in court if and only if they are jointly optimistic about their chances of being right.
5. If players are jointly optimistic with respect to their chances of being right, their joint optimism increases with their confidence in the court.

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[12] To avoid complications we assume in this section on perfect confidence that initially none of the players is absolutely certain about who is right, so $0 < \rho_1^i < 1$.

We continue by considering the adjustments of the beliefs, see Eqs. (8-) and (8+). It is easily derived[13] that $\rho_{2-}^i \leq \rho_1 \leq \rho_{2+}^i$. The equalities occur if and only if ρ_1 is equal to one or to zero, for then, if a verdict is consistent with a player's belief, then he learns nothing new, while if the verdict is inconsistent, the player is certain that the verdict is wrong. If players are not completely certain about who is right, they will use the information incorporated in the court's verdict. The player who loses will adjust his belief that he is right (ρ), downward, while the player who won will adjust his belief ρ upward.

Finally, we will consider the estimated probabilities of winning the appeals case, see Eqs. (9+) and (9-). We can rewrite these as

$$p_{2+}^i = (1 - r_2) + \rho_{2+}^i (2r_2 - 1), \tag{12+}$$

respectively

$$p_{2-}^i = (1 - r_2) + \rho_{2-}^i (2r_2 - 1). \tag{12-}$$

This leads to the following conclusions.

6. Taking for granted that $r_2 > \frac{1}{2}$, the estimated probability of winning an appeal trial (p_{2+}^i or p_{2+}^i) is positively correlated with the belief that one is right (ρ_{2+}^i respectively ρ_{2-}^i).
7. The range of probability estimates is limited to $(1 - r_2) \leq p_{2-}^i$, $p_{2+}^i \leq r_2$.
8. If the confidence put in the different courts does not differ, so if $r_1 = r_2$, then it is easy to see[14] that $p_{2-}^i \leq p_1^i \leq p_{2+}^i$.
9. Unfortunately, in the more general case where $r_2 > r_1$, the relation between the estimated probability of winning in Stages 1 and 2 is unclear. The reason is that both the beliefs and the confidence in the accuracy of the verdict change. For instance: suppose that the player who won at the first trial believed that he was probably wrong. As a result of winning, he now has more confidence that he is right, but still this belief may be smaller[15] than $\frac{1}{2}$. Thus the player still prefers that during any appeals the judges make a mistake. Suppose now that the judgment of the court of second instance is trusted more than that of the court of first instance, so a mistake in the second trial is less likely than in the first trial. Then in total this player may think that his chances of winning in the second stage are smaller than the chances he gave himself of winning in the first stage.

Furthermore, Eqs. (12+) and (12-) imply that

$$p_{2+}^i + p_{2-}^j - 1 = (2 r_2 - 1) r_1 (1 - r_1) (\rho_1^i + \rho_1^j - 1) / (p_1^i (1 - p_1^j)), \quad \text{where } i \neq j. \tag{13}$$

Hence there is joint optimism with respect to the chances in court in Stage 2 if and only if there is such joint optimism in Stage 1. However, we cannot say whether in the second stage players are jointly more or less optimistic than in the first stage.

5.4 Players are myopic

We are especially interested in the effects of this learning on the strategies of players in tax disputes. In this section we assume that players are myopic. By that, we mean that players do not realize beforehand that the verdict in first instance contains information which may change the beliefs of players. Hence, the analysis of the first stage in Section 4 fully applies to the first stage here. Once the court of first instance has given his decision, players do

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[13] Note that, because $(1 - r_1) \leq p_1^i \leq r_1$, the denominator of Eq. (6+), p_1^i, is at most equal to r_1, while the denominator of Eq. (6-), $(1-p_1^i)$, is at least equal to $(1-r_1)$.

[14] Recall that p_g^i increases in ρ_g^i and that $\rho_{2-}^i \leq \rho_1 \leq \rho_{2+}$.

[15] This happens if the confidence in the first court is low enough.

learn from it and hold different beliefs. During the second stage players may therefore act differently than in Section 4.

In Section 4 we found an appeal rate equal to one. The reason was that the legal costs of one more trial were lower, while the disputed amount had not. However, there the estimated probabilities of winning were the same for both stages. With (myopic) updating this is no longer true.
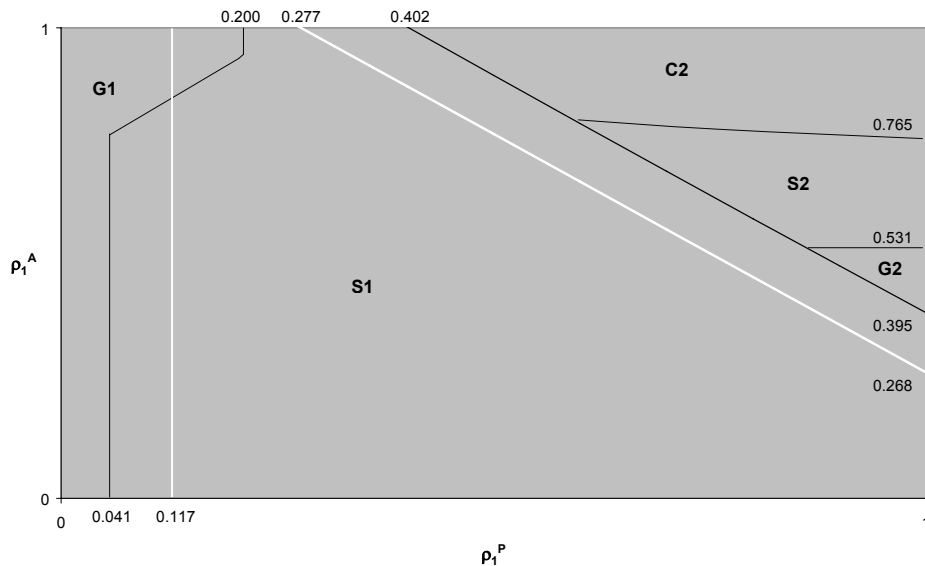
Figure 7a. Scenario 1, myopic players, $r_1 = r_2 = 0.95$: P wins the first trial
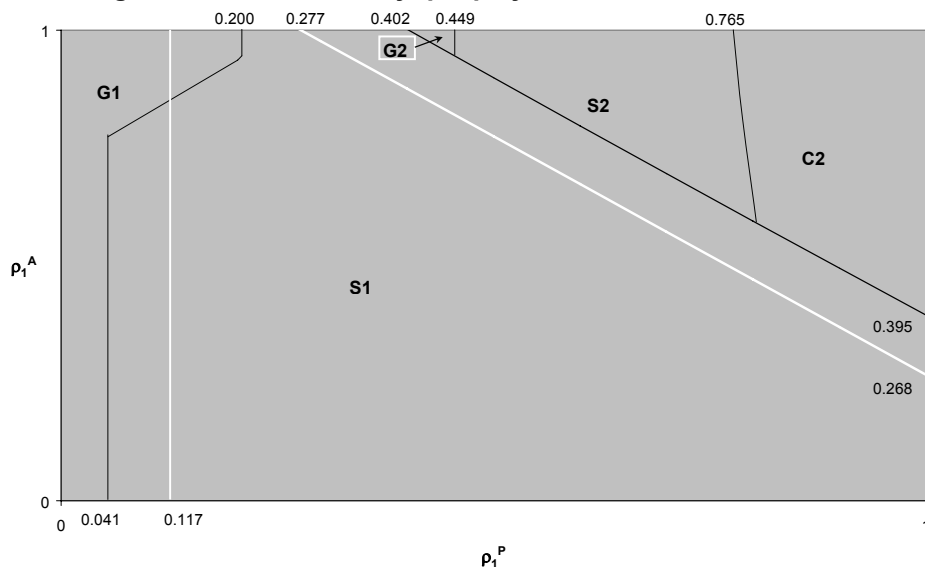
Figure 7b. Scenario 1, myopic players, $r_1 = r_2 = 0.95$: A wins the first trial

Figure 7 shows the possible consequences. It is based on the parameters of Scenario 1, and the society has relatively much and equal confidence in the courts: $r_1 = r_2 = 0.95$.[16] Note that the results for the first stage are identical to those in Figure 5.[17] In the second stage

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[16] Below, we will discuss the cases where the confidence in both instances, respectively in the first instance only, is significantly lower.

[17] Note however that the axis now contain ρ_1^P and ρ_1^A instead of p_1^P and p_1^A. Eq. (10) shows that, given r_1, there is a positive linear relation between ρ_1^i and p_1^i, where $i = P, A$. For $r_1 = r_2 = 0.95$ the relation is given by $p_1^i = 0.05 + 0.9 \rho_1^i$. The line $\rho_1^i = 0.117$ in Figure 7 therefore corresponds to the line $p_1^i = 0.155$ in Figure 5.

however, the unsatisfied player has now lost some faith in his case. Therefore, he may now prefer giving up to appealing to the court of second instance. And when the unsatisfied player still has a credible threat, the players may now be jointly less optimistic than in the first stage because they learned from the verdict. As a result, it is possible that players go to court in the first stage, while the players do not go to court in the second stage. Instead the losing player may give up, or the players may agree on a settlement.

We now examine the role of the public trust in the courts, by varying the confidence levels in the courts (r_1 and r_2). Suppose first that the confidence is lower for all instances. This affects the decisions in both stages. The effects on the decisions in the first stage are due to the importance of the trust in the court of first instance for the probability with which each player expects to win a trial in the first stage. First, if a player, say i, believes that he probably is right ($\rho_1^i > 0.5$), then his reduced confidence in the court of first instance also reduces the probability with which he expects to win in first instance. However, if player i believes that he probably is wrong ($\rho_1^i < 0.5$), then he hopes that the court will make a mistake. Therefore he thinks it is more likely to win the first trial when the verdict in first instance is less reliable. Thus, if the critical value for having a credible threat is lower than 0.5, then this critical value will decrease in the perceived reliability of the court of first instance. So if the confidence in the court of first instance is reduced, P is more likely to have a credible threat. Second, as is apparent from Eq. (11), if players are jointly optimistic, they will be less so if their confidence in the court of first instance decreases. Hence, a reduced level of trust in the courts will ensure that the players are less likely to go to court.

In the second stage, the decisions are not only affected by the reduced confidence in the court of second instance (along the lines as discussed for the first stage), but also by the reduced confidence in the court of first instance. Due to the latter, the players adjust their beliefs less after the verdict in first instance. Therefore the unsatisfied player is more likely to have a credible threat if there is less confidence in the court of first instance. However, the effects of the confidence in the court of first instance on the degree of joint optimism in the second stage are analytically unclear. The numerical results suggest that there is an increase in the level of joint optimism due to the lower r_1 which is larger than the decrease in joint optimism as a result of the reduced r_2. Hence the appeal rate is higher when the confidence in both instances is lower.
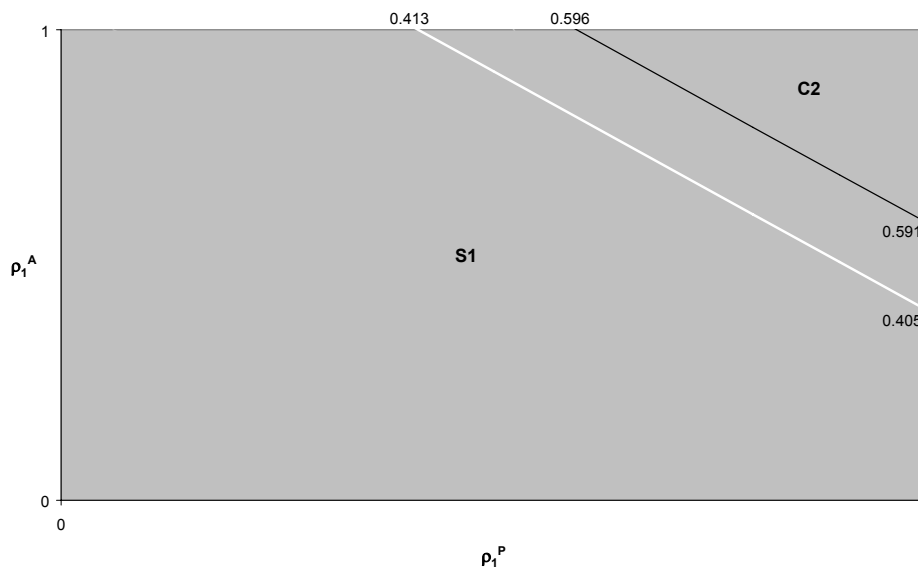
Figure 8. Scenario 1, myopic players, $r_1 = r_2 = 0.8$

Observe also that Conclusions 2 and 7 from Section 5.3 imply that $p_g^i \in [0.05, 0.95]$ for any player and any part of the game, given that the confidence in the courts is equal to 0.95.

Figure 8 presents the results for $r_1 = r_2 = 0.8$. Note that, as p_1^P is at least 0.2, player P always has a credible threat in model OLD (see Figure 5). Figure 8 shows that (i) in Stage 1 player P is less likely to give up (namely: never), (ii) in Stage 1 players are less likely to go to court, and (iii) the appeal rate is higher (in fact, it is equal to one).

Finally, we are interested in the effects of having different levels of confidence in the courts of first and second instance[18]. To gain some insight in this matter, we study the case where $r_1 = 0.8$ and $r_2 = 0.95$. We assume here that although the players are myopic, they do know that the court of second instance is, in their opinion, more 'reliable'. Hence, during the first stage they expect that the probability of winning a trial in the second stage is equal to

$$E_1^i(p_2^i) = \rho_1^i r_2 + (1 - \rho_1^i)(1 - r_2).$$
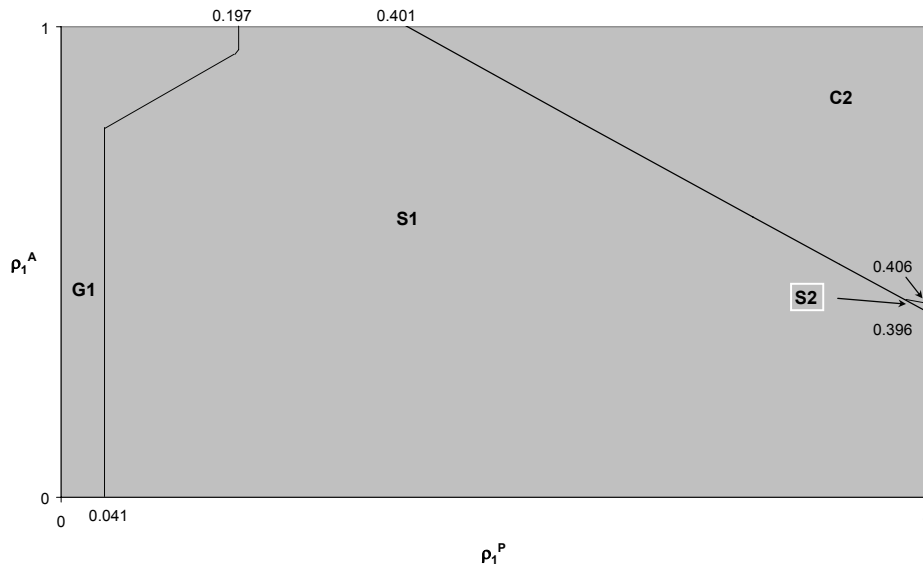
Figure 9 shows the results for Scenario 1 in model NEW.

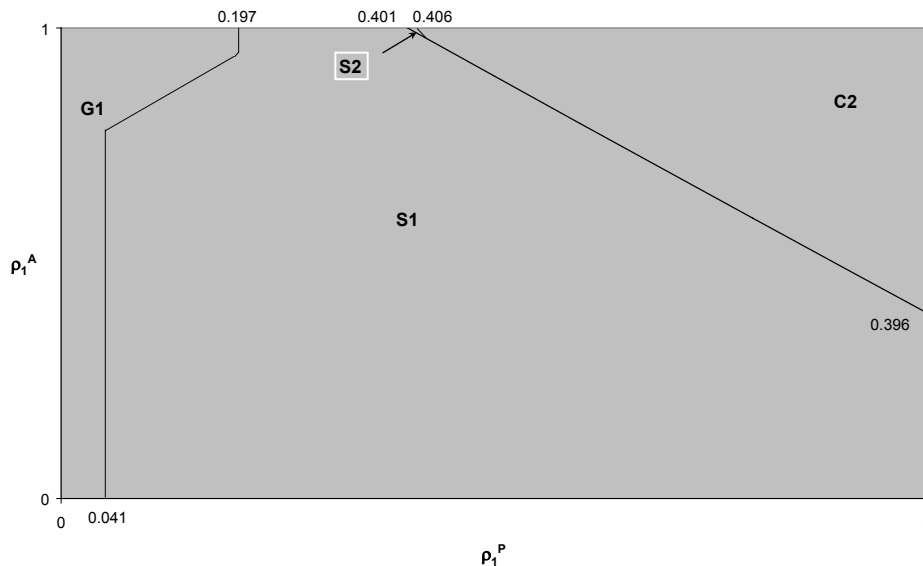**Figure 9a. Scenario 1, myopic players, $r_1 = 0.8$, $r_2 = 0.95$: P wins the first trial**

Figure 9b. Scenario 1, myopic players, $r_1 = 0.8$, $r_2 = 0.95$: A wins the first trial

[18] See also Shavell (1995).

As could be expected, Figure 9 is a cross between Figures 7 and 8. Note that, during Stage 1, the estimated probabilities and expected outcomes for Stage 2 are the same as in Figure 7. However the estimated probability of winning or losing the first trial is somewhat different. Therefore the decisions in the first stage in Figure 9 differ only slightly from those in Figure 7. However, the results for the second stage in Figure 9 are very to Figure 8. Because players learn relatively little from the verdict of the first court, they do not adjust their beliefs (ρ) much. As a result, in most cases the players will prefer to go to court in the second stage if they did so in the first stage. Sometimes, there is a reduction in the level of joint optimism, which is large enough to make a settlement acceptable to the players.

Summarizing, for the case with myopic players we can conclude that:
1. Since players are myopic, they do not take into account that they will learn from the verdict of the court of first instance. Hence Conclusion 1 of Section 4.3 that the introduction of the court of second instance leads to less trials in Stage 1 applies here too.
2. Since players in Stage 2 have learned from the verdict, they may act differently than in Section 4. Depending on the level of confidence in the instances, the appeal rate may be anything from 0 to 1.
3. Given joint optimism by the players, they are more likely to go to the court of first instance if the confidence in courts is higher. The appeal rate will, however, be lower.
4. The results suggest that, in model NEW, the confidence in the appeals court is of major importance for the decisions for Stage 1, while the confidence in the court of first instance is of major importance for the decisions in Stage 2.
    The effects of introducing a court of second instance depend largely on the level of confidence in the OLD case[19]. If there was much confidence (relative to the confidence in the appeals court in NEW), then the number of trials in first instance decreases, because of the additional costs of the expected appeal case. If there was relatively little confidence, then the number of trials may increase. On the one hand, the expected appeals case in the second stage increases the incentives for players to settle in the first stage; on the other hand, the higher confidence in the court of second instance increases the joint optimism in the final outcome, which increases the incentives for players to go to court[20].

5.5 Players are far-sighted

When players are myopic, the information contained in the verdict in first instance affects the decisions in Stage 2 only. However, far-sighted players do realize at the start of the first stage how any verdict will affect the beliefs and decisions in the second stage. Knowing that, the players may prefer different actions in the first stage.

Figure 10 presents the results for Scenario 1 if $r_1 = r_2 = 0.95$. During the second stage myopic and far-sighted players choose of course the same actions (Figure 7).

Looking at the first stage, we see that far-sighted players are more likely to go to court. The cause is, of course, that players realize that the expected outcomes in the second stage are different, because players learn from the verdict in the first stage. It is for instance possible that the unsatisfied player gives up (because that player lost too much faith in his case), or that players agree to settle (because the level of joint optimism decreases sufficiently). If

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[19] Note that all myopic players expect that any trial in the first stage will certainly result in a trial in the second stage, for the additional costs are lower than the disputed amount, while the level of optimism does not decrease ($r_2 \geq r_1$).

[20] The last possibility is unlikely in the case of the additional court in the Dutch tax litigation, as the only court in the OLD situation was the 'Gerechtshof', while in the NEW situation the 'Gerechtshof' is the court of second instance. Therefore, the quality of the single instance in the OLD situation is likely to be similar to that of the second instance in the NEW situation.

players know that in the second stage players will either give up or settle, then they are more likely to go to court in the first stage because they expect to have less legal costs in the second stage, while – due to the updating of players conditional on the verdict in first instance – the disputed amount remains sufficiently large in Stage 1.
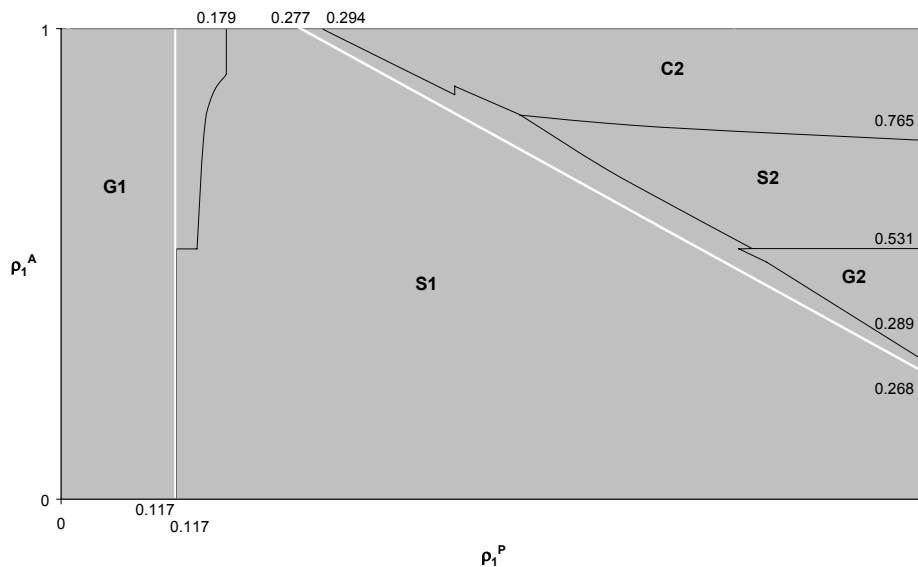
Figure 10a. Scenario 1, far-sighted players, $r_1 = r_2 = 0.95$: P wins the first trial
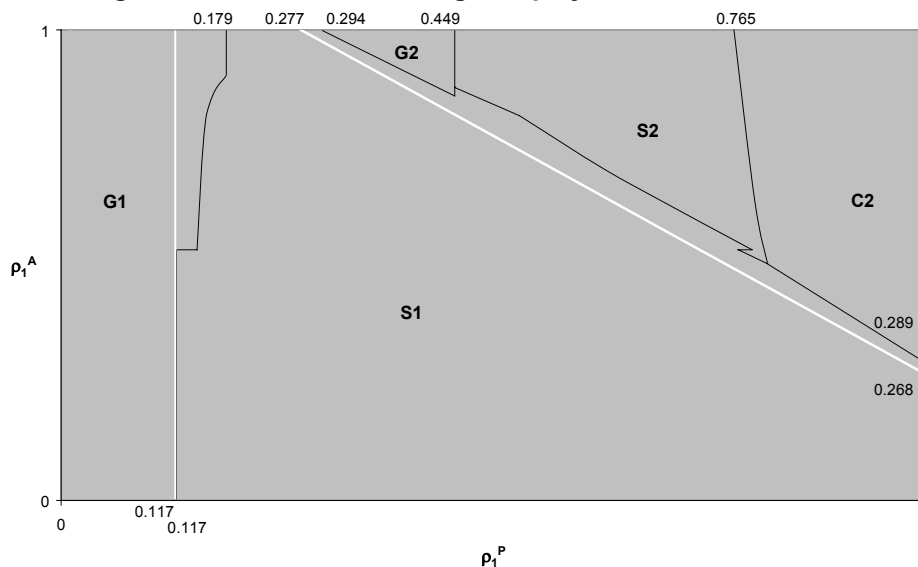
Figure 10b. Scenario 1, far-sighted players, $r_1 = r_2 = 0.95$: A wins the first trial

Observe also that P is more likely to give up, unless A has much faith in A's position. This can be explained as follows. Note that B loses faith in his case if he loses in first instance, but becomes more confident if he wins. Suppose now that A is not too sure about his case. In the neighborhood of the border between G and S, P expects to lose. Moreover after losing in Stage 1, P loses so much faith in his case, that he won't have a credible threat in Stage 2. Combined this outweighs the gains which P has after winning in first instance. Consequently P is more likely to give up at the start.

Now suppose that A is quite sure about his case. Then it is less important whether P has a credible threat after losing in first instance: the resulting settlement (if a settlement is at all possible) is quite unattractive to P anyhow. However, if P wins then the settlement may become worthwhile, since A loses faith. This second effect outweighs the first if initially A has much faith in his position.
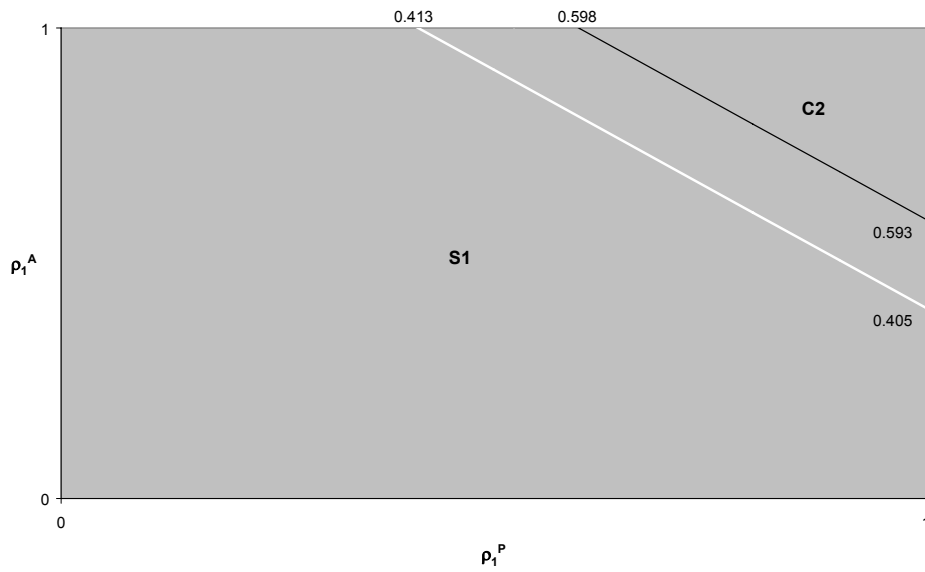
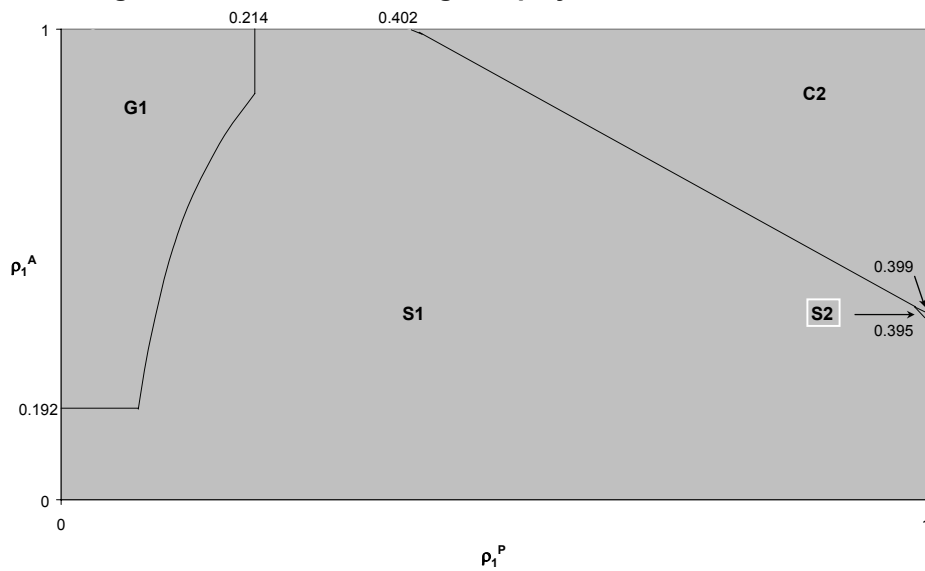**Figure 11. Scenario 1, far-sighted players, $r_1 = r_2 = 0.8$**

Figure 12a. Scenario 1, far-sighted players, $r_1 = 0.8$, $r_2 = 0.95$: P wins the first trial
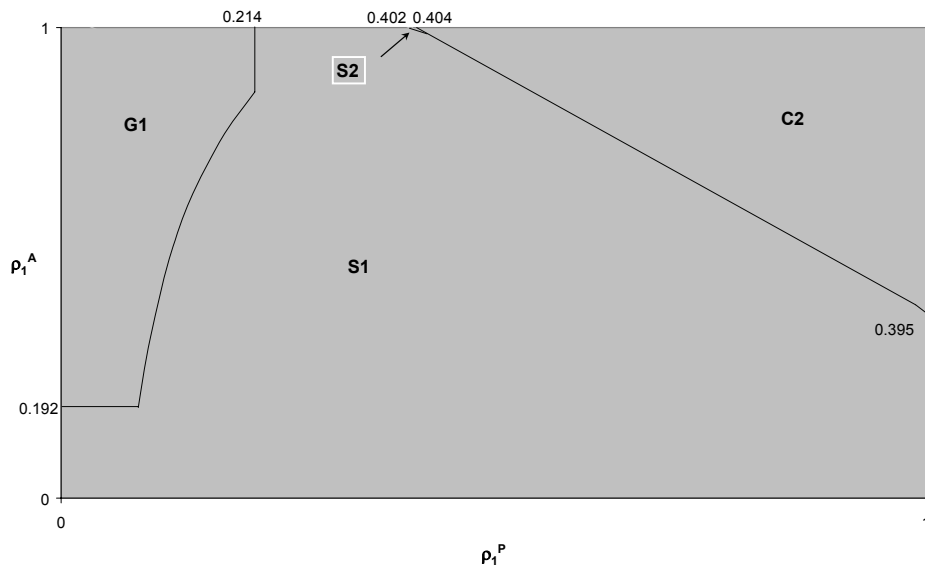

Figure 12b. Scenario 1, far-sighted players, $r_1 = 0.8$, $r_2 = 0.95$: A wins the first trial

Note that the appeal rate depends on the joint distribution of beliefs ρ_1^P and ρ_1^A. If these beliefs are uniformly distributed than the appeal rate is lower with far-sighted players than with myopic players. So the appeal rate may be lowered both by the updating of players (see Section 5.4), as by the prospect of players updating in future.

As we did in Section 5.4, we look at the role of the confidence in the courts by considering two alternative cases. In the first case we assume that $r_1 = r_2 = 0.8$ (see Figure 11) and in the second that $r_1 = 0.8$ and $r_2 = 0.95$ (see Figure 12).

Figure 11 differs only marginally from Figure 8. The difference is that here players know that their beliefs will change after the first verdict. As a consequence their expected costs of the appeals case increase, and their incentives to go to court in Stage 1 decrease. Finally, Figure 12 is a cross between Figures 10 and 11, just as Figure 9 was a cross between Figures 7 and 8.

Summarizing, we find that:
1. The main conclusions for myopic players also apply to far-sighted players.
   - The introduction of a court of second instance leads to less trials in first instance.
   - Depending on the amount of confidence people have in the courts, the appeal rate can vary from 0 to 1.
   - Given the faith players have in their positions, when the confidence in the courts is higher players will go to trial more often in first instance. The appeal rate, however, will be lower.
2. If the confidence in courts is high and the appeal rate is clearly smaller than 1, then players will go to court more often if they are far-sighted than if they are myopic.

6 Final considerations

In this section we consider a few topics which are relevant in the context of this paper, but are outside the scope of our model. In Section 6.1 we discuss the fact that, in many cases, the tax administration is a repeat player who is not only interested in the outcome of the current dispute, but also of future disputes. In Section 6.2 we consider the incentives of tax payers to evade taxes. Section 6.3 discusses the effects of risk aversion of players. Finally, Sections 6.4 considers the role of asymmetric information.

6.1 The tax administration as a repeat player.

The judgment of a court also depends on case law, *i.e.* on the verdicts in previous similar cases. So if the court's verdict favors the tax payer in the present case, future verdicts in similar cases are more likely to favor the tax payer. This observation is mainly relevant to the tax administration, which is involved in every tax dispute and (thus) in many similar disputes. The tax administration is therefore a *repeat player* in the terminology of Galanter (1974). We expect that in general the tax payer is a *one-shot player*, who does not expect to be involved in a similar tax dispute again.

Consider model OLD. In this model the effects of case law are relatively clear, especially when case law is of such importance that all future verdicts will follow the current verdict. Because tax payer P is a one-shot player, P is only interested in the outcome of this dispute. The tax administration (A) however knows that if he goes to court now on this matter, he will never have to go to court again on this matter, because in all future similar cases players know what the court's verdict will be. Therefore, if A expects similar cases in future, then the expected benefits to A of going to court are larger, while the expected costs are the same. As a consequence, it is less likely that there exists a settlement amount which is acceptable to both players. Hence players are more likely to go to court.

In model NEW the consequences of A being a repeat player are much less straightforward. Naturally, we could do a similar analysis in NEW as we did in OLD. The results could be that, if case law is important in both OLD and NEW, the introduction of a second substantive instance leads to less trials in first instance, all of which are followed by an appeal case; and moreover, that the number of trials in first instance is higher than without case law.

However, such analysis avoids certain essential issues. For example, it is relevant whether verdicts of courts in first and in second instance are equally important in case law, and, if not, which weight is being attached to which instance. Similarly it matters what weight (if any at all) is attached by the appeals court to the verdict of the court of first instance. If players expect that the verdict of the court of second instance depends (to some degree) on the verdict in first instance, then players will realize that their chances in the appeals court depend on whether they won or lost in the court of first instance. Hence players should condition the estimates of their chances in second instance on the outcome in first instance (see also Section 5). Such an analysis is outside the scope of this paper.

6.2 Tax evasion

By tax evasion we mean the attempt to pay less taxes than one ought to pay, hence it excludes 'honest mistakes' by tax payers. Although measuring tax evasion is extraordinarily complicated, it is clear that a substantial share of the tax statements is too low. In their review article Andreoni, Erard and Feinstein (1998) estimate on basis of data from the American tax administration IRS, that a third of the US households attempts to evade taxes.

Andreoni *et al.* also review the large theoretical literature on the choice of tax payers whether or not to evade taxes. In their seminal article, Allingham and Sandmo (1972) assume that there is a tax payer P, who knows how much taxes he should pay, the likelihood with which an attempt at evasion is successful and the penalty which follows discovery of the fraud. Given that knowledge, P decides for which amount (if any) he tries to evade his taxes. In later literature this decision is often formulated as a game, in which the tax administration (A) decides on the intensity (or probability) with which they review tax statements, thereby determining the probability of evading taxes successfully. Of course, a more intensive review process costs more, but an uncovered attempt at tax evasion yields additional benefits (more tax revenues plus the fine) to A. Naturally, P has stronger incentives to evade taxes if the A is less likely to find out, while A has stronger incentives to review the tax statements if evasion is more probable[21].

There are many variations and extensions to this model in the literature. In part of that literature the choice of A is modeled, while in the other part the probability of discovering fraud and the fining scheme are given.

From the theory it is known that less taxes are evaded when the expected penalty is more severe (*e.g.* due to increased fines or higher probability of getting caught). It is interesting to see what the results of the additional instance in tax litigation implies for the amount of tax evasion, using the model described above.

If tax payer P evades taxes and he is caught, than the tax agency charges him for an amount (Y) equal to the amount of taxes evaded plus some fine. Because P knows that he is wrong (tax evasion is intentional), he will have relatively little faith in his case. In contrast, tax administration (A) will have much faith. It seems likely that the height of the fines is not affected by the additional instance. However, the presence of a court of second instance can affect the outcomes for P if he gets caught, for example by affecting the strategies of the players. Figure 5 enables us to distinguish the following effects.

– If P has little faith in his case, and A has much faith in his, then the introduction of the court of second instance makes it less likely that P has a credible threat. Tax evasion becomes therefore less attractive.

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[21] As a consequence, the resulting game typically has no pure Nash equilibrium.

- As far as P can threaten credibly, players are more likely to settle. But if players go to the court of first instance, they also go to the appeals court. The expected legal costs of getting caught may therefore increase or decrease, making tax evasion less respectively more attractive.
- The settlement amount is affected too by the additional instance. If the expected legal costs in an appeal case are higher for P than for A, then the bargaining position of P is weakened by the extra instance. Then tax evasion is less attractive.

An additional effect of the additional instance is that this may influence the probability with which the tax evader is caught. The more time tax inspectors spend in court, the less time they have for finding fraud.

Concluding, the introduction of an additional instance in the tax litigation has several effects on the attractiveness of tax evasion for tax payers. The net effect, however, remains unclear without more information on *e.g.* the joint distribution of estimates by the players.

6.3 Risk aversion

Our model does not include all possible costs and benefits. Examples of excluded costs and benefits are the social condemnation (or approval) after a conviction, (indirect) costs related to the required time to litigate (or settle) the case, or a possible aversion to risk. Here we focus on the latter.

We can make three observations. Firstly, since risk averse tax payers are less inclined to take risks, they will be more careful in filing their tax statements. This leads to less tax disputes. Secondly, if there is a dispute, the tax payer will typically have much faith in his case. The tax payer is therefore more likely to prefer going to court to either settling or giving up. Thirdly, tax payers will dislike the risk involved in a trial, and therefore be more likely to prefer a settlement or giving up to a trial. Clearly the last two effects are opposite to each other. Whether the share of the disputes which are given up, settled respectively tried increases or decreases depends on which of the last two effects dominate. However, for the effects of risk aversion on the total number of cases in court, we should also consider the first. This first effect lowers the total number of tax disputes. Therefore the number of tax cases in court may still be lower due to risk aversion, even if the second effect dominates the third effect. The total effect is therefore *a priori* unclear.

6.4 Asymmetric Information

A substantial strand of the literature gives asymmetric information as an explanation for cases in court. See for instance Bebchuk (1984), Reinganum and Wilde (1986) and Daughety and Reinganum (2005). Because players cannot verify each others information, they have different estimations of their chances in court. As a result, there may not exist a settlement agreement which is acceptable to both players.

This asymmetry in information is an explanation of why players may have different estimates of the chances of the plaintiff. However, if in the court of first instance all information is revealed, there is no asymmetry in information in the second stage. Hence, if all differences in the estimations were due to asymmetric information, then players will share the same estimates during the second stage and they will not go to trial in the second stage. In this respect it is worthwhile to note that parties in an appeals case may only rely on evidence which was either used in the court of first instance and on new evidence which that party did not have to know before.

Concluding, we can say that, in as far as the differences in estimates of players are caused by asymmetric information and given that this asymmetry is removed in the court of first instance, the appeal rate will be lower.

7 Conclusions

Since January 2005, Dutch tax litigation has a second substantive instance. In this paper, we extended a standard theoretical model to investigate which effects this change has on the way in which players end the dispute. Where the non-linearities and large number of model parameters required it, we employed some representative numerical simulations to supplement the analysis.

In the first part of the paper (Sections 3 and 4) we followed the existing literature by using given estimates of the players of their chances in court. This enabled us to formulate answers to our first three questions. Questions 1 and 2 involved the influence of the additional substantive instance on the decisions in the first stage, so on the likelihood with which the players go to court, with which they settle, respectively with which the tax payer gives up. The third question was which appeal rate we can expect.

In general, it appeared, it is unclear whether tax payers will take action against a tax assessment more or less often after the extra instance is introduced. This depends on the actual joint distribution of the chances players expect to have in court. What we can say is that, given this distribution, players will go to trial less often than before. In other words, players should jointly be more optimistic before they go to court. Also the model predicts that the appeal rate equals one, so the party who lost will always appeal.

Furthermore, the likelihood with which a dispute is brought to court depends positively on the disputed amount and the refund of legal costs the tax payer can obtain if he wins. It depends negatively on the legal costs of the players and the court fees.

Partly because of the improbably high appeal rate, we extended the model further in the second part of this paper (Section 5). There the probability by which a player expects to win in court is split into two components: (i) the probability that this player is right, and (ii) the probability that the verdict of the court is correct. This has several effects. For instance, the probability of winning a case in court estimated by the players is limited by the confidence they have in the verdict of that court. If players have less faith in the judgment of the court, their level of joint optimism is lower and they are less likely to go to court.

However, the distinction between the probability of being right and winning a trial is also relevant for the faith players have in their chances in the second stage. For example, the verdict of the court of first instance is a signal of who is right. Players may use this information to improve their own estimates of being right. If players are myopic, the consequences are limited to the second stage only. But if players are far-sighted, this also affects their decisions in the first stage.

The analysis shows that if players have perfect confidence in the judgment of the courts, the verdict of the first court will be executed. Therefore the appeal rate is equal to zero. Moreover if players are far-sighted, they act exactly as in model OLD, for they now that the players abide by the verdict of the court of first instance.

The results are different when the confidence in courts is less than perfect. Then fewer cases go to court in the first stage, but the appeal rate will be higher.

As a final comment, we emphasize that the model considers existing tax disputes. In other words, the substantive tax law and the degree of tax evasion are considered given. Naturally, also these two factors may and will change over time.

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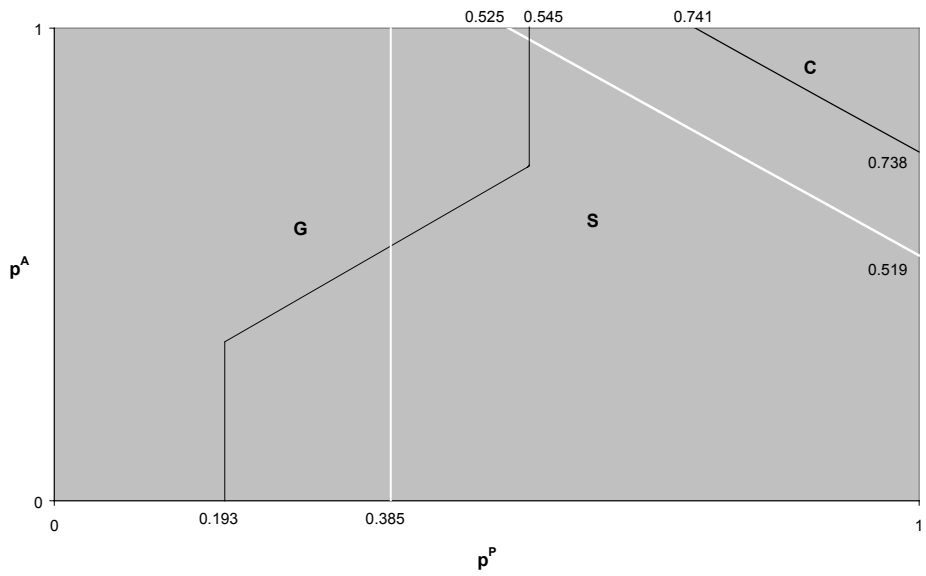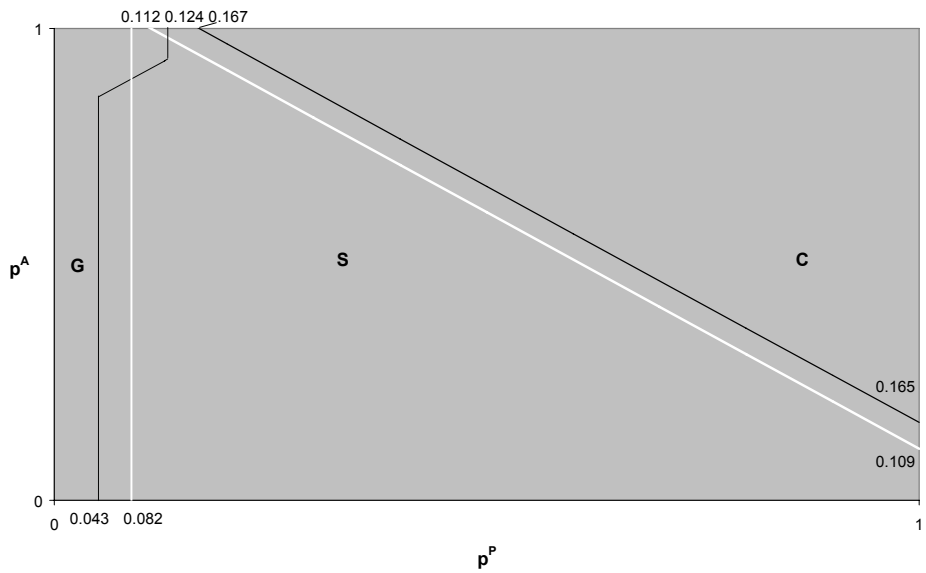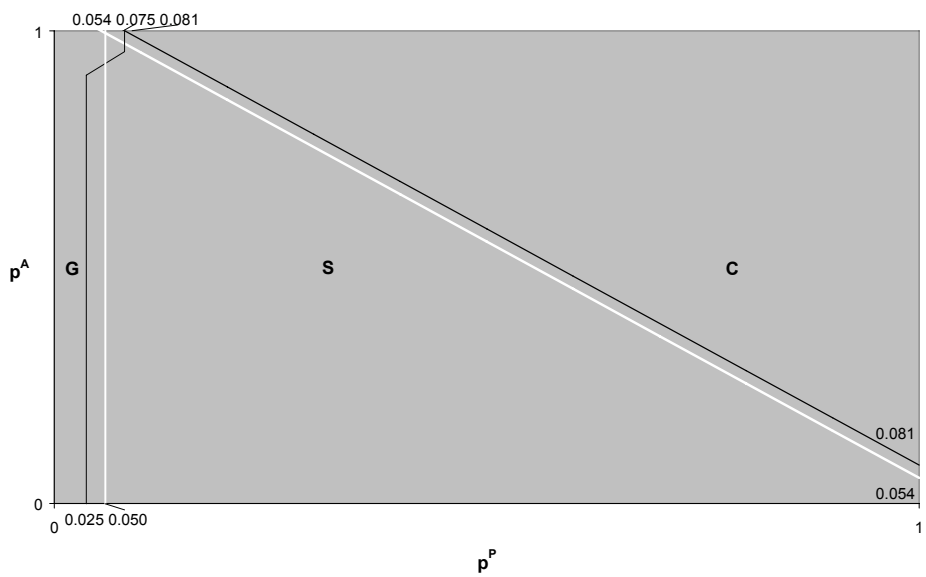
Appendix
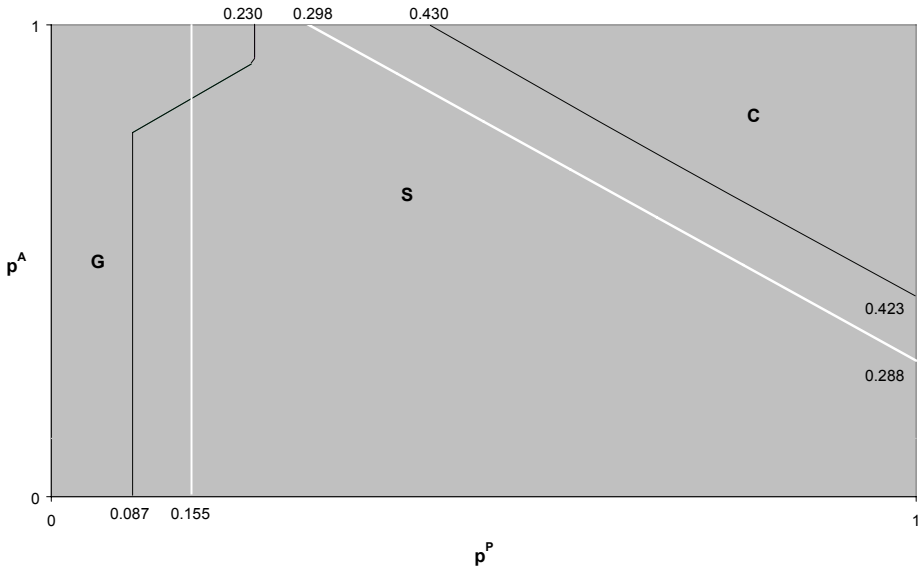
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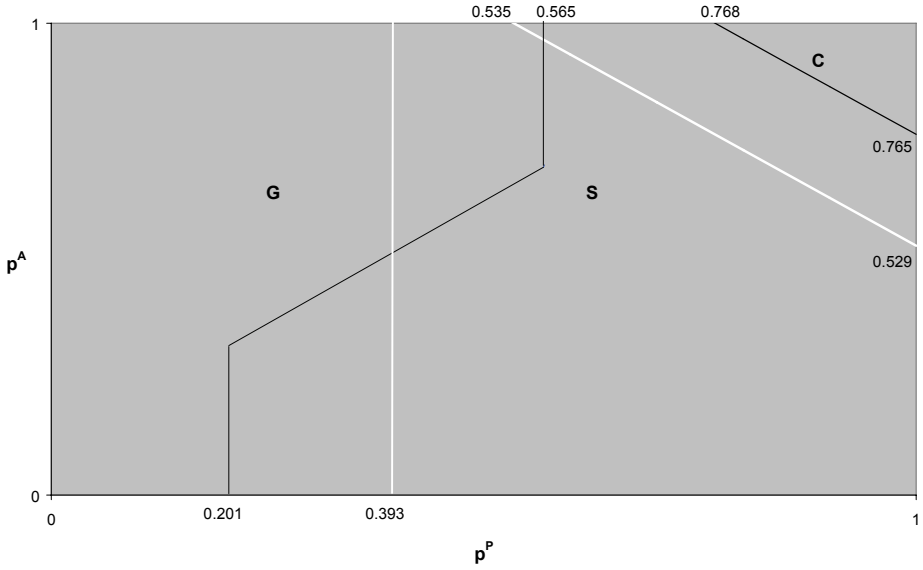
Scenario 3

Scenario 4

Scenario 5

Scenario 6