Economic Consequences of Global Accounting Convergence: An Experimental Study

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Abstruct

This paper aims to examine whether the movement toward the convergence of International Financial Reporting Standards (IFRS) has finally come to an end. The methodology for this research is based on comparative institutional analysis (Aoki, 2001; Grief, 2006) and experimental game theory (Camerer, 2003) as well as the Nash equilibrium of game theory (Binmore, 2010). In addition, we adopt a 3×3 coordination game because one of the essential factors of global accounting convergence is the coordination of accounting standards (Hail et al., 2010; Taguchi, 2009). The results of this study confirm the termination of such movement toward the convergence of IFRS. In sum, although game theory anticipates global accounting convergence, our experiments show that countries that adopted the strategy of maintaining their own initial system do not offer long-term cooperation since they ultimately become *"egoists*."

Keywords

game theory; comparative institutional analysis; experimental game theory; the Nash equilibrium; IFRSs; IASB; convergence; adoption; comparability; coordination game;

JEL Classification

D74; F55; K22; M41; M48; P51

1 Introduction

This paper aims to examine whether the movement toward the convergence of International Financial Reporting Standards (IFRS) has finally come to an end. The methodology in this research is based on comparative institutional analysis (Aoki, 2001; Grief, 2006) and experimental game theory (Camerer, 2003) as well as the Nash equilibrium of game theory (Binmore, 2010). In addition, we adopt a 3×3 coordination game because one of the essential factors of global accounting convergence is the coordination of accounting standards (Hail et al., 2010; Taguchi, 2009). We begin with an overview of the present state of global accounting convergence. In terms of economic globalization, the social concern about global accounting convergence has steadily increased during the past several years. More than 100 countries have adopted or will adopt IFRS. However, to date, both the United States and Japan have not adopted these principles-based standards. According to the International Accounting Standards Board (IASB), the primary objective is

> “To develop a single set of high quality, understandable, enforceable, and globally accepted IFRSs through its standard-setting body, the IASB.[1] ”

In other words, the IASB is attempting to become the sole accounting standard for the world, especially in regard to convergence. Therefore, this study focuses on the economic consequences of global accounting convergence.

2 Related Literature

2.1 The argument for and against the convergence

There are many arguments about IFRS (Hail et al., 2010). Some studies support the convergence for the benefit of comparability[2] of financial statements and network ex-

[1]This quotation is from IASB website (http://www.ifrs.org/The+organisation/IASCF+and+IASB.htm).
[2]IASC (1989) lists ”comparability” as the one of the essential factors of financial statements.

ternalities (De Franco et al., 2009; Meeks and Swann, 2009; Katz and Shapiro, 1994). On the other hand, some researchers oppose the convergence and believe that standard-setting should be left to the competition since the current standard-setter is a monopoly (Dye and Sunder 2001). For example, Sunder (2002) stated that competition helps create more efficient regulations. Although many arguments exist for and against the idea of convergence, minimal attention has been focused on conflict and coordination among countries, especially in regard to accounting standards. In addition, since the consequences of global convergence have not been predicted, this point remains open for discussion.

2.2 The limit of archival studies and the needs of experimental studies

Furthermore, there are several empirical studies that have examined the usefulness of IFRS (Barth et al., 2008; Daske et al., 2008), but they were only partial verifications that lacked the cost benefit of adopting a single set of standards at the international level (IFRS). Therefore, we experiment with artificial situations to discover more about such benefits and consequences.

The methodology in this research is based on comparative institutional analysis (Aoki, 2001; Grief, 2006) and experimental game theory (Camerer, 2003) as well as the Nash equilibrium of game theory (Binmore, 2010) and we test the prediction of game theory by experiments.

Wysocki (2011) discusses some recent advances in the field of ’new institutinal accounting’ (NIA), and this research is also based on the NIA approach.

3 The Model

The model of this study is based on Taguchi's (2009) model, which is a 3x3 coordination game[3].This is because one of the essential factors of global accounting convergence is the coordination of accounting standards (Hail et al., 2010; Taguchi, 2009).

Our model is a simple coordination game wherein a player chooses one of three systems: System A, System B, or System N. There are two players per game (Player 1 and Player 2) who each represent a country. Each player has their own initial system from the outset—System A for Player 1 and System B for Player 2— and changing their initial systems will cost each player a certain amount of money (Figure 1). When players adopt the same systems, they receive benefits for such coordination (Figure 2), which include benefits from network externalities (Katz and Shapiro, 1985, 1986, and 1994) and the comparability of financial statements (IASC, 1989).

Insert Figure 1 and 2 about here.

Each player chooses one from three strategies: the first strategy is that a player doesn't change their own initial system (we call it the *"Stay"* strategy), the second strategy is that a player chooses the system which the partner (the other player) has adopts initially (we call it the *"Others"* strategy), and the third strategy is that a player chooses the system which no one have adopts initially (we call it the *"New"* strategy.)

The existence of their initial systems and the costs to change their systems are the most important factors to consider when undergoing institutional change. In reality, countries have initial accounting standards and making changes to such standards comes with a cost. These factors are known as institutional inertia (Aoki, 2001) or focal point (Shelling, 1963).

We focus on the payoff function for players 1 and 2, which is shown in the following

[3] Yue-chang and Xiao (2006) shows the 2 $\times$ 2 game for global accounting convergence.

equation as benefit minus cost:

$$\pi_h = b_{ij} - c_{hk} + T \tag{1}$$

Here, T is the endowment for each player. The benefit of coordination is shown as b_{ij}, which is derived by comparability and network externalities. In addition, it benefits Player h when player 1 adopts is i (i =*S (Stay), O (Others), N (New)*) and player 2 adopts j (j =*S (Stay), O (Others), N (New)*) as their strategies. The cost to change the system is shown as c_{hk}. It is the cost when player h chooses the k (k =*S (Stay), O (Others), N (New)*) strategy. We assume them as follows:

$$b_{SO} > 0, b_{OS} > 0, b_{NN} > 0, b_{SS} = b_{OO} = b_{SN} = b_{NS} = b_{ON} = b_{NO} = 0. \tag{2}$$

$$c_{1S} = c_{2S} = 0, c_{1O} > 0, c_{2O} > 0, c_{1N} > 0, c_{2N} > 0. \tag{3}$$

The payoff matrix is shown in Table 1 as follows:

Insert Table 1 about here.

3.1 The equilibrium (1): the dilemma of IFRS

In this subsection, we solve the game that includes four outcomes. The first is the base model that meets three conditions:

(1) Each benefit is at the same level ($b_{SO} = b_{OS} = b_{NN} = \bar{b}$)

(2) Each cost is at the same level ($c_{1O} = c_{2O} = c_{1N} = c_{2N} = \bar{c}$)

(3) Each benefit exceeds each cost ($b - c > 0$).

In the second outcome, each cost is at the same level ($c_{1O} = c_{2O} = c_{1N} = c_{2N} = c$) but each benefit is different. The third is where each benefit is at the same level (b_{SO} =

$b_{OS} = b_{NN} = b$) but each cost is different. Finally, the fourth outcome is where both the benefits and the costs are different.

As the first step in our analysis, we examine the base model. The other outcomes will be examined in Section 6. As seen in Table 2, the payoff matrix of the base model is as follows:

Insert Table 2 about here.

In addition, Table 3 shows the payoff matrix for the base model in the simple case of $T = 1, \bar{b} = 2, \bar{c} = 1$.

Insert Table 3 about here.

The following proposition shows the Nash equilibrium of the game:

Proposition 1 *Nash Equilibrium and its Characteristics (Taguchi, 2009).*
In this case, the Nash equilibrium consists of three sets of strategies:
(strategy of player 1, the strategy of player 2)= (Stay, Others)
= (Others, Stay)
= (New, New)
The Nash equilibrium (Stay, Others) and (Others, Stay) are the Pareto optima but are not "fair" conditions, which is defined as equitable payoff for each player. This is because only one player incurs the cost of changing his/her own system to the other's system. On the other hand, the Nash equilibrium (New, New) is a "fair" (equitable payoff for each player) condition but not the Pareto optimum. This is because all players incur the same cost for changing their own system to system N.

As seen in Proposition 1, this case includes the multiple equilibrium problem (Cho and Kreps, 1987), wherein equilibrium is not specifically determined. This proposition shows two implications for global accounting convergence.

First, there are three patterns of *"a single set of accepted international financial reporting standards"* by the IASB; it is not a natural result wherein countries around the world adopt a particular accounting system a priori although IASB aims the Nash equilibrium *(New, New)*.

Second, the proposition also shows the relationship between the three equilibrium patterns, in which there is the trade-off between *"fair"* (equitable payoff for each player) and the pareto optimum. We call this trade-off *"The dilemma of IFRS."* Although the IASB aims for equilibrium *(New, New)*, this equilibrium is not the pareto optimum but one deemed as *"fair."* In addition, we may suppose that the player who aims for the equilibrium *(Stay, Others)* or *(Others,Stay)* is from the United States. For example, it appears that the U.S. Securities and Exchange Commission (SEC) aims for the convergence to Statements of Financial Accounting Standards (SFAS) since the payoff for the U.S. would be higher than other countries.

3.2 The equilibrium (2): the concept of mixed strategy

Since the base model includes the multiple equilibrium problem, we solve the base game with the concept of mixed strategy in this subsection.

According to Taguchi (2012), the following proposition shows the mixed strategy of this base model.

Proposition 2 *The mixed strategy of the base model.*
The mixed strategy of the base model is the strategy to adopt both the 'Stay' strategy with the probability of fifty percent and the 'New' strategy with the probability of fifty percent.

Proof. See Taguchi (2012).

This proposition means that the only Nash equilibrium *(New, New)* would survive in the base model, even though this equilibrium is not the Pareto optimum. Therefore, We call this paradox *"the another dilemma of IFRS."*

3.3 The hypotheses

We propose the following hypotheses for the base model:

Hypothesis 1 *The dilemma of IFRS (Proposition 1)*

H1-1. Each player adopts each system by the same probability.

H1-2. Each Nash equilibrium is realized by the same probability.

Hypothesis 2 *The another dilemma of IFRS (proposition 2)*

H2-1. Each player adopts both 'Stay' strategy and the 'New' strategy with the same probability (fifty percent).

H2-2. Only the (New, New) equilibrium is realized.

4 Experimental design

To explain our experimental design, we again used the case in which $T = 1, \bar{b} = 2$ and $\bar{c} = 1$ (see the table 3).

We report data from the 34 subjects shown in the design table 4, collected in 2 separate sessions, with typically 12 or 20 subjects participating in each session.

Insert Table 4 about here

Sessions were all conducted at Doshisha University in Japan. Subjects were primarily undergraduate students from Doshisha University and were recruited by advertisements and e-mail. Due to the abstract and relatively simple nature of the decision task, a background in accounting was not a prerequisite for participation. No one took part in more than one session of this experiment. Over the experiments, each participant took part in 20 rounds of decision making. They took about 90 min (including instructions) to complete, and subjects earned about 2,578 Japanese yen on average.

The experiment was run on networked computers, using the z-Tree experiment software package (Fischbacher, 2007) (Figure 3). Subjects were asked not to communicate directly with one another, so the only interactions were via the computer program. All treatments rematched pairs of subjects randomly each period to minimize the potential impact of reciprocal concerns.

Insert Figure 3 about here.

At the beginning of a session, subjects were seated in a single room and given a set of written instructions. The instructions were read aloud to subjects, in an attempt to make the rules of the game common knowledge. After the instructions were read, subjects were given a short quiz to ensure that they understood the instructions. In the instructions, we strove to use neutral terminology.

After action choices were entered, each subject was shown the following information: own action, other's action, own payoff (Figure 4). In all treatments, subjects were not given information about the results of any other pairs of subjects, either individually or in aggregate. At the end of the round, subjects were asked to observe their result, write the information from that round down onto a record sheet.

Insert Figure 4 about here.

At the end of round 20, the experimental session ended. Each subject received his/her earnings from 20 rounds, at an exchange rate of 50 yen per point. Additionally, all subjects received a 1,000 yen show-up fee.

5 Results of the Base Model Experiment

5.1 Personal Decision: Rates of the Strategies that Subjects Adopted

34 subjects were took part in this experiment and each subject played 20 rounds, giving us 680 observations overall. To show the results of the experiment, we focus on the rates of the strategies that subjects adopted, as shown in Table 5 and Figure 5.

Insert Table 5 about here.

Insert Figure 5 about here.

Contrary to our hypothesis, the results clearly indicate that subjects had a tendency to either maintain their initial system or adopt their partner's system, but not adopt system N. The probability that subjects adopted system N was significantly lower according to the chi-square test (1%). The results rejected H 1-1 and H 2-1.

Insert Figure 6 about here.

Next, we focus on these rates in time series. As seen in Figure 6, the results clearly indicate that subjects tend to maintain their initial system and to adopt their partner's system. From Rounds 1 to 20, the probability of *"Stay"* strategy (maintain initial system) and that of *"Others"* strategy (adopt their partner's system) are high rate.

5.2 Matching:Rates of the Combination of Strategies

As seen in Table 6 and Figure 7, the rate of (S, O) and (O, S) (the Pareto optimum) is a very high 47.35% and the rate of (N, N) (the "fair" equilibrium) is 0%.

This result is interesting because game theory predicted that the combination of strategies of (N, N) is one of the Nash equilibrium (H1-2) or the only realized Nash equilibrium (H2-2). The results rejected H 1-2 and H 2-2.

Insert Table 6 about here.

Insert Figure 7 about here.

There is the implication for global accounting convergence. Theoretically speaking, there are two possibility of economic consequences of global accounting convergence. First, there are three patterns of "a single set of accepted international financial reporting standards": *(Stay, Others), (Others, Stay)*, and *(New, New)*. We call this trade-off consequence *"the dilemma of IFRS."* Second, By the concept of mixed strategy, there is the only one pattern of "a single set of accepted international financial reporting standards": *(New, New)*. We call this consequence *"the another dilemma of IFRS."*

However, contrary to the prediction of game theory, there is no possibility for the realization of the "fair" equilibrium of *(New, New)*, but there is the high possibility of realization for the "unfair" but Pareto optimum (*(Stay, Others), (Others, Stay)*).

In addition, the *"unfair"* convergence of *(Stay, Others), (Others, Stay)* will be achieved but the *"fair"* convergence of *(New, New)* will not, since the current IASB plans a convergence of *(New, New)*. This is due to the combinations of the *"egoists"* (e.g., the United States) and the *"generous"* (e.g., Japan). Such combinations will in fact, create the *"unfair"* equilibrium of *(Stay, Others), (Others, Stay)*. Therefore, we return to our research question of will the movement toward the convergence of IFRS finally come to an end? Here, two types of answers can be considered. First, termination is confirmed if the IASB is central to the convergence, which is the current style of global convergence. Second, a negative answer would occur only if the United States is central to the convergence that would be the *"unfair"* equilibrium of *(Stay, Others), (Others, Stay)*.

In addition, the rate of *(Stay, Stay)* is so high 38.82%. In the set of strategies *(Stay, Stay)*, Player 1 has adopted System A and Player 2 has adopted System B, which are both the initial systems for each of the players. This means that each subject do nothing by him/herself and want the other player (his/her partner) to change their initial system. This amazing result is also "the unintended consequence," which is contrary to the prediction of the game theory.

In this case, there is also the implication for global accounting convergence. Theoretically speaking, the consequence in which both of players adopt *Stay* strategy will not be realized. However, contrary to the prediction, there is the high possibility for a realization of the combination of strategies of *(Stay, Stay)*. The situation wherein countries do nothing and maintain their initial systems will be realized. This raises the question: Why was the rate of the combination of *(Stay, Stay)* higher? This was simply due to institutional inertia. To achieve the equilibrium of *(New, New)*, all of the players must cooperate with one another. However, if a partner betrays such cooperation, the other player will bear the cost and receive no overall benefit (i.e., net loss). As a result, the losing partner will not have any incentive to cooperate. In other words, if all of the players become *"egoists,"* then coordination will be impossible.

We return to our research question of will the movement toward the convergence of IFRS finally come to an end? The answer is simply "yes." Our results imply that the global accounting convergence by IASB will not be realized.

6 Extension

6.1 Case 2 in which Each Benefit is Different but the Costs are the Same

6.1.1 Theory

In this subsection, we solve the case 2 in which each cost is the same ($c_{1O} = c_{2O} = c_{1N} = c_{2N} = \bar{c}$) but each benefit is different. This situation means that accounting standards (i.e., systems) have different benefits from one another. As seen in Table 7, the payoff matrix of this case is as follows:

Insert Table 7 about here.

In this case, the Nash equilibrium is determined by the magnitude relationship between the following four terms: $b_{SO} - \bar{c}, b_{OS} - \bar{c}, b_{NN} - \bar{c}$, and 0. Therefore, as seen in Table 8, we can divide this game into the following 24 cases:

Insert Table 8 about here.

As seen in Table 8, when the benefit of coordination is less than the cost of coordination, the sets of coordination strategies are always omitted. In addition, when the benefits of coordination are less than the costs of coordination in all of the coordination sets, the set of strategies *(Stay, Stay)* is a unique Nash equilibrium (e.g., in patterns 4, 8, 12, 16, 20, and 24). In the set of strategies *(Stay, Stay)*, Player 1 has adopted System A and Player 2 has adopted System B, which are both the initial systems for each of the players. Thus, the set of strategies *(Stay, Stay)* means that all of the players have adopted the same strategy of maintaining their initial systems.

We focus on patterns 19 and 23, in which the only term of $b_{NN} - \bar{c}$ is higher than 0. This condition means that the coordination strategy of System N is the only strategy in which the benefit of coordination is higher than the cost of coordination. On the other hand, the coordination strategies of Systems A and B are the strategies in which the benefits of coordination are less than the costs of coordination. Therefore, in these cases, System N is the only "high quality" system for each of the players because Systems A and B are not. For example, Table 9 shows the payoff matrix for the simple case in that $b_{SO} = b_{OS} = 0.5, b_{NN} = 2$ and $c_{1O} = c_{2O} = c_{1N} = c_{2N} = \bar{c} = 1$.

Insert Table 9 about here.

To solve this case, we derive the following proposition:

Proposition 3 *The "High Quality" dilemma of IFRS*
In the case in which the only term of $b_{NN} - \bar{c}$ is higher than 0, not only the combination of strategies of (New, New) but also the combination of (Stay, Stay) are the Nash equilibrium. The Nash equilibrium (New, New) is the Pareto optimum, but the Nash equilibrium (Stay, Stay) is not.

As seen in Proposition 3, this case is also the multiple equilibrium problem wherein the equilibrium is not specifically determined. Therefore, the Nash equilibrium can be the coordination strategy toward the "high quality" system and the strategy to do nothing.

This proposition shows two implications for global accounting convergence. First, even if the IFRS is the only "high quality" accounting system for all of the existing accounting systems in the world, the convergence toward a universal accounting system is not always the natural result. The consequence in which all of the countries adopt the strategy of maintaining their initial systems (which is not the Pareto optimum) is another natural result. This consequence is interesting because both the power to coordinate a new high quality standard (the equilibrium *(New, New)* and the power to maintain their own existing standards (i.e., do nothing) will work when existing standards malfunction. Second, for global accounting convergence to occur, the IASB must not simply develop a new ”high quality” standard but also consider the relationships among the accounting standards in the world, especially since the strategy to maintain their initial systems is the best for all of the countries.

Therefore, we again return to our research question of will the movement toward the convergence of IFRS finally come to an end? According to our theoretical results, the answer is ”yes” and ”no” which implies that global accounting convergence is not always the natural result.

We propose the following hypotheses for the base model:

Hypothesis 3 *The High Quality dilemma of IFRS (Proposition 3)*

H3-1. Each player adopts both 'Stay' strategy and the 'New' strategy with the same probability (fifty percent).

H3-2. Both the (Stay, Stay) equilibrium and (New, New) equilibrium are realized with the same probability (fifty percent).

6.1.2 Experimental Design

In this subsection, we examine the results of the experiment of case 2 using the pattern in which $b_{SO} = b_{OS} = 0.5, b_{NN} = 2$ and $c_{1O} = c_{2O} = c_{1N} = c_{2N} = \bar{c} = 1$ (as seen in Table 9). The essence of experimental design is the same as the base model experiment.

We report data from the 40 subjects shown in the design table 10, collected in 2 separate sessions, with typically 20 subjects participating in each session.

Insert Table 10 about here.

Sessions were all conducted at Doshisha University and Aoyamagakuin University in Japan. Subjects were primarily undergraduate students from Doshisha University and Aoyamagakuin University and were recruited by advertisements and e-mail. Due to the abstract and relatively simple nature of the decision task, a background in accounting was not a prerequisite for participation. Over the experiments, each participant took part in 20 rounds of decision making. They took about 90 min (including instructions) to complete, and subjects earned about 2,085 Japanese yen on average.

The experiment was run on networked computers, using the z-Tree experiment software package (Fischbacher, 2007). Subjects were asked not to communicate directly with one another, so the only interactions were via the computer program. All treatments rematched pairs of subjects randomly each period to minimize the potential impact of reciprocal concerns. At the end of the round, subjects were asked to observe their result, write the information from that round down onto a record sheet. At the end of round 20, the experimental session ended. Each subject received his/her earnings from 20 rounds, at an exchange rate of 50 yen per point. Additionally, all subjects received a 1,000 yen show-up fee.

6.1.3 Results of the Case 2 Experiment

40 subjects were took part in this experiment and each subject played 20 rounds, giving us 800 observations overall. To show the results of the experiment, we again focus on the rates of the strategies that subjects adopted, as shown in Table 11 and Figure 8.

Insert Table 11 about here.

Insert Figure 8 about here.

As seen in Table 11 and Figure 8, the subjects had a tendency to maintain their initial systems or adopt System N. The anticipation of game theory is significantly supported according to the chi-square test (1%). The result didn't reject H 3-1.

Next, we focus on these rates in time series.

Insert Figure 9 about here.

As seen in Figure 9, the results clearly indicate as follows: from Rounds 1 to 10, subjects tend to maintain their initial system and to adopt their partner's system, from Rounds 11 to 20, however, subjects tend to adopt their partner's system. The result didn't reject H 3-1.

Table 12 shows the rates of the combination of strategies.

Insert Table 12 about here.

As seen in Table 12, the rate of *(Stay, New)* (or *(New, Stay)*) was the highest 44%. This result was amazing because *(Stay, New)* (or *(New, Stay)*) is not the Nash equilibrium. This combination means that a player change his/her initial system to system *New* but the partner betray him/her and does nothing (textit"egoist" player). This result rejected H 3-2.

There is an implication for global accounting convergence. Even when IFRS is the only "high quality" accounting system for all of the countries in the world, the existence of spiteful nations ("egoist" player) that do not adopt IFRS makes the convergence unstable.

Insert Figure 10 about here.

Next, we focus on these rates in time series. As seen in Figure 10, the rate of *(Stay, New)* and that of *(Stay, Stay)* was higher in the first half. However, in the latter half, the rates of *(New, New)* increased.

This result shows, on the contrary, that the only "high quality" accounting system is accepted by many countries in the long run. If IFRS is the only "high quality" accounting system for all of the countries in the world, global convergence will be facilitated in the long run.

Again, we return to our research question of will the movement toward the convergence of IFRS finally come to an end? The answer is mixed: "yes" (Table 12) and "No" (Figure 10). The convergence toward the only "high quality" accounting system is not always the natural result.

6.2 Other Cases

Two other cases exist in regard to this study. The third case is where each benefit is the same ($b_{SO} = b_{OS} = b_{NN} = \bar{b}$) but each cost is different, whereas the fourth case is where both the benefits and the costs are different. In these two cases, as seen in subsection 6-1, the Nash equilibrium is determined by the magnitude relationship between the following terms:

$\overline{b} - c_{1O}(= \overline{b} - c_{2O}), \overline{b} - c_{1N}, \overline{b} - c_{2N}$, and 0,

$b_{SO} - c_{2O}, b_{OS} - c_{1O}, b_{NN} - c_{1N}, b_{NN} - c_{2N}$, and 0.

Therefore, we can divide this game into 24 cases (as in the third case) and 120 cases (as in the fourth case). The essence of the games remains the same as in the case seen in subsection 6-1.

7 Conclusion

In this study, we examined whether the movement toward the global accounting convergence of IFRS has finally come to an end. According to our research, there are two overall implications.

First, although game theory anticipates global accounting convergence by the IASB, our experiments indicate two possibilities: 1) The possibility of the convergence to another current system (e.g. the US GAAP or FSAS); and 2) The countries of the world will adopt the strategy of maintaining their own initial systems (i.g., do nothing) and not cooperate by becoming textit"egoists".

Second, the theory shows that even if system *New* is the only "high quality" system for all of the players, not only the combination of strategies of *(New, New)* but also the set of strategies of *(Stay, Stay)* are the Nash equilibrium. Our experiments indicate that the only "high quality" accounting system in the world is not always accepted by all the countries (some countries maintain their initial systems (i.g., do nothing)). The convergence toward the only "high quality" accounting system is not always the natural result.

Finally, the overall message is that although game theory anticipates global accounting convergence, our experiments also show that countries that adopted the strategy to maintain their individual systems do not provide long-term cooperation since they ultimately become *"egoists."*

Figure 1: Setting (1)

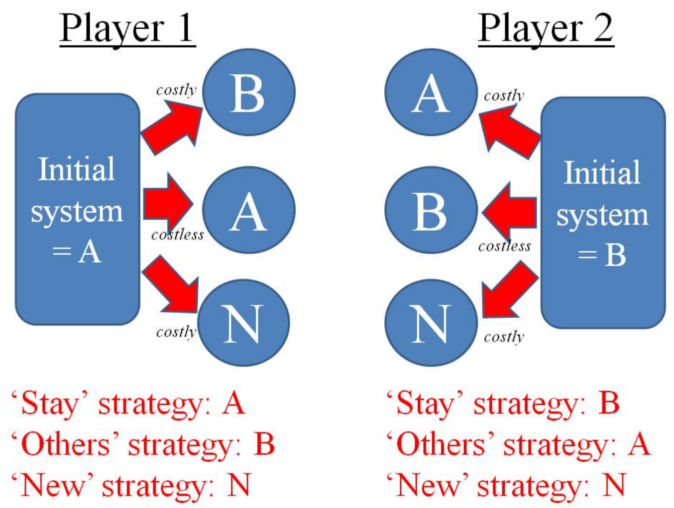

Figure 2: Setting (2)

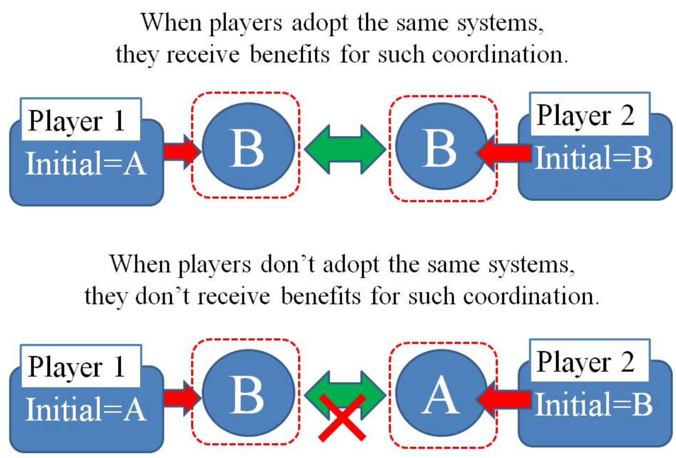

Figure 3: z-tree

Figure 4: Information after action choices were entered

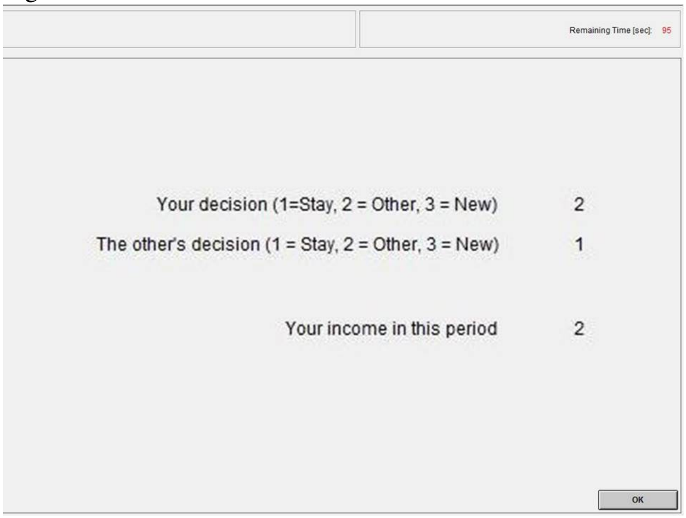

Figure 5: Rates of the Strategies that Subjects Adopted

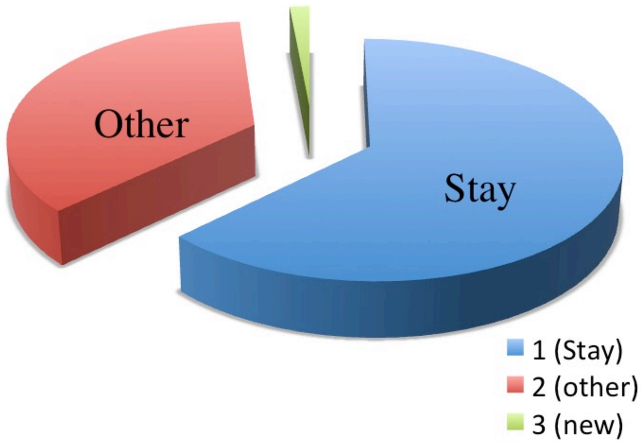

Figure 6: Rates of the Strategies that Subjects Adopted in Time Series

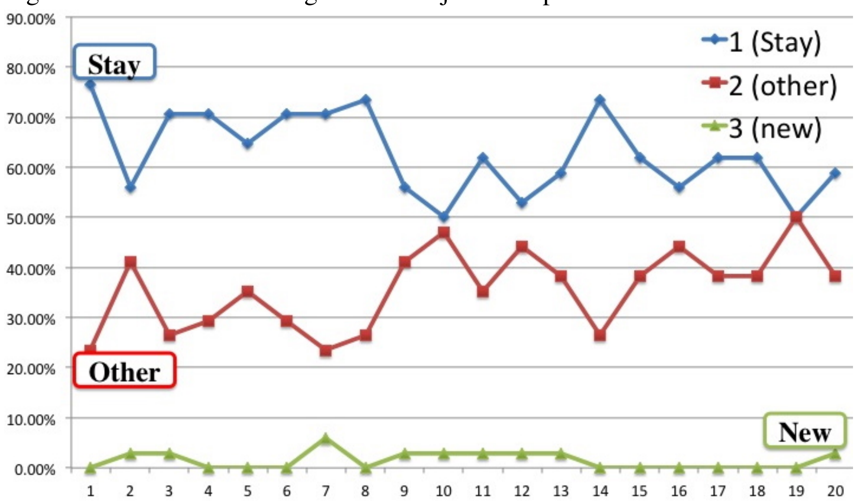

Figure 7: Rates of the Combinations of Strategies in Time Series

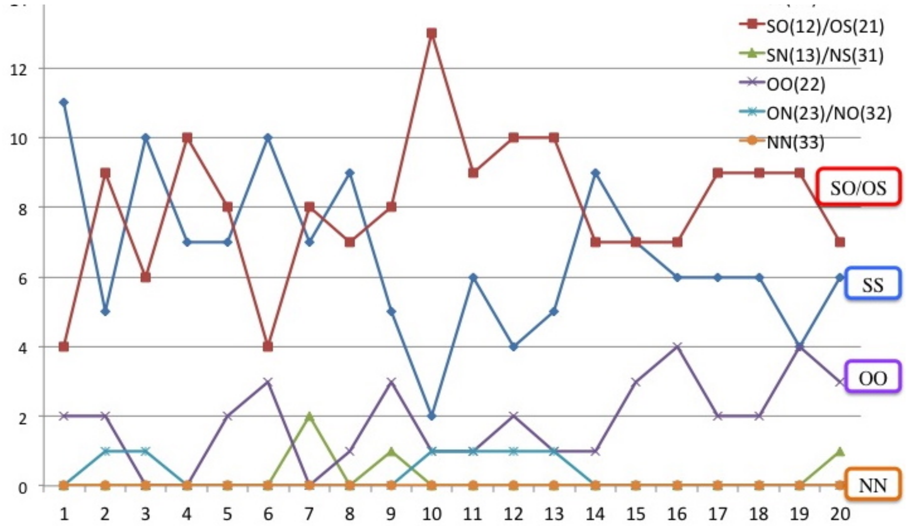

Figure 8: Rates of the Strategies that Subjects Adopted (Case 2)

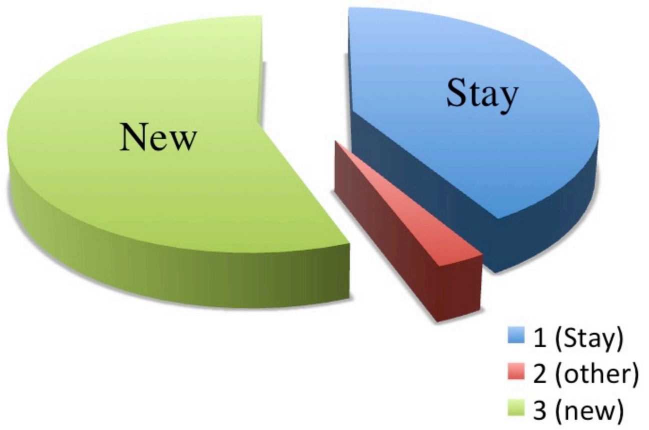

Figure 9: Rates of the Strategies that Subjects Adopted in Time Series (Case 2)

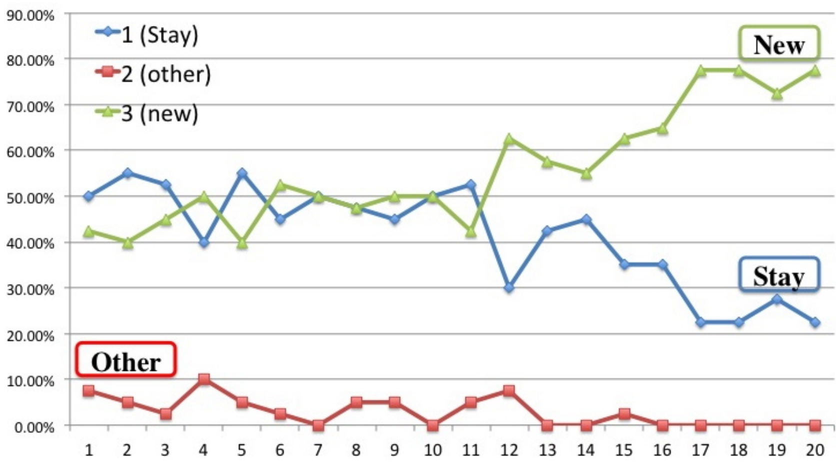

Figure 10: Rates of the Combinations of Strategies in Time Series (Case 2)

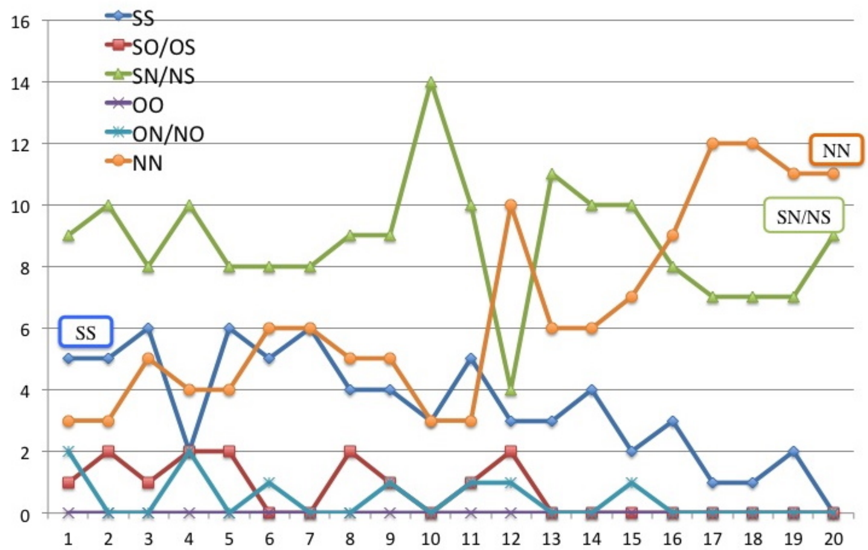

Table 1: Payoff matrix

		Player 2		
		Stay	Other	New
Player 1	S	T,T	$b_{SO}+T,b_{SO}-c_{2O}+T$	$T,-c_{1N}+T$
	O	$b_{OS}-c_{1O}+T,b_{OS}+T$	$-c_{1O}+T,-c_{2O}+T$	$-c_{1O}+T,-c_{2N}+T$
	N	$-c_{1N}+T,T$	$-c_{1N}+T,-c_{2O}+T$	$b_{NN}-c_{1N}+T,b_{NN}-c_{2N}+T$

Table 2: Payoff matrix of the base model

		Player 2		
		Stay	Other	New
Player 1	S	T,T	$\bar{b}+T,\bar{b}-\bar{c}+T$	$T,-\bar{c}+T$
	O	$\bar{b}-\bar{c}+T,\bar{b}+T$	$-\bar{c}+T,-\bar{c}+T$	$-\bar{c}+T,-\bar{c}+T$
	N	$-\bar{c}+T,T$	$-\bar{c}+T,-\bar{c}+T$	$\bar{b}-\bar{c}+T,\bar{b}-\bar{c}+T$

Table 3: Payoff Matrix of the Base Model in which $T = 1, \bar{b} = 2, \bar{c} = 1$

(the Endowment = 1, $b_{SO} = b_{OS} = b_{NN} = \bar{b} = 2$, $c_{1O} = c_{1N} = c_{2O} = c_{2N} = \bar{c} = 1$)

		Player 2		
		Stay	Other	New
Player 1	S	1, 1	3, 2	1, 0
	O	2, 3	0, 0	0, 0
	N	0, 1	0, 0	2, 2

Table 4: Characteristics of Subjects (Base Model)

Session	Time	Place	Subjects	Male	Female	Average age
1	Nov 25, 2011	Doshisha University	14	7	7	21.7
2	June 18, 2012	Doshisha University	20	13	7	20.9
			34	20	14	21.2

Table 5: Rates of the Strategies that Subjects Adopted

	S (Stay)	O (Others)	N (New)	Total
Sample Number	427	243	10	680
Rate (%)	62.79	35.74	1.47	100

Table 6: Rates of the Combinations of Strategies

	SS	SO/OS	SN/NS	OO	ON/NO	NN	Total
Sample Number	132	161	4	37	6	0	340
Rate (%)	38.82	47.35	1.18	10.88	1.76	0.00	100

Table 7: Payoff Matrix of this Case

		Player 2		
		Stay	Other	New
Player 1	S	T, T	$b_{SO}+T, b_{SO}-\bar{c}+T$	$T, -\bar{c}+T$
	O	$b_{OS}-\bar{c}+T, b_{OS}+T$	$-\bar{c}+T, -\bar{c}+T$	$-\bar{c}+T, -\bar{c}+T$
	N	$-\bar{c}+T, T$	$-\bar{c}+T, -\bar{c}+T$	$b_{NN}-\bar{c}+T, b_{NN}-\bar{c}+T$

Table 8: Relationship Magnitude between the Four Terms and the Nash Equilibrium

Pattern	Small			Large	Nash Equilibrium
1	0	$b_{NN}-\bar{c}$	$b_{OS}-\bar{c}$	$b_{SO}-\bar{c}$	$(S,O),(O,S)$ and (N,N)
2	$b_{NN}-\bar{c}$	0	$b_{OS}-\bar{c}$	$b_{SO}-\bar{c}$	(S,O) and (O,S)
3	$b_{NN}-\bar{c}$	$b_{OS}-\bar{c}$	0	$b_{SO}-\bar{c}$	(S,O)
4	$b_{NN}-\bar{c}$	$b_{OS}-\bar{c}$	$b_{SO}-\bar{c}$	0	(S,S)
5	0	$b_{OS}-\bar{c}$	$b_{NN}-\bar{c}$	$b_{SO}-\bar{c}$	$(S,O),(O,S)$ and (N,N)
6	$b_{OS}-\bar{c}$	0	$b_{NN}-\bar{c}$	$b_{SO}-\bar{c}$	(S,O) and (N,N)
7	$b_{OS}-\bar{c}$	$b_{NN}-\bar{c}$	0	$b_{SO}-\bar{c}$	(S,O)
8	$b_{OS}-\bar{c}$	$b_{NN}-\bar{c}$	$b_{SO}-\bar{c}$	0	(S,S)
9	0	$b_{NN}-\bar{c}$	$b_{SO}-\bar{c}$	$b_{OS}-\bar{c}$	$(S,O),(O,S)$ and (N,N)
10	$b_{NN}-\bar{c}$	0	$b_{SO}-\bar{c}$	$b_{OS}-\bar{c}$	(S,O) and (O,S)
11	$b_{NN}-\bar{c}$	$b_{SO}-\bar{c}$	0	$b_{OS}-\bar{c}$	(O,S)
12	$b_{NN}-\bar{c}$	$b_{SO}-\bar{c}$	$b_{OS}-\bar{c}$	0	(S,S)
13	0	$b_{SO}-\bar{c}$	$b_{NN}-\bar{c}$	$b_{OS}-\bar{c}$	$(S,O),(O,S)$ and (N,N)
14	$b_{SO}-\bar{c}$	0	$b_{NN}-\bar{c}$	$b_{OS}-\bar{c}$	(O,S) and (N,N)
15	$b_{SO}-\bar{c}$	$b_{NN}-\bar{c}$	0	$b_{OS}-\bar{c}$	(O,S)
16	$b_{SO}-\bar{c}$	$b_{NN}-\bar{c}$	$b_{OS}-\bar{c}$	0	(S,S)
17	0	$b_{OS}-\bar{c}$	$b_{SO}-\bar{c}$	$b_{NN}-\bar{c}$	$(S,O),(O,S)$ and (N,N)
18	$b_{OS}-\bar{c}$	0	$b_{SO}-\bar{c}$	$b_{NN}-\bar{c}$	(S,O) and (N,N)
$\underline{19}$	$b_{OS}-\bar{c}$	$b_{SO}-\bar{c}$	0	$b_{NN}-\bar{c}$	(N,N) and $\underline{(S,S)}$
20	$b_{OS}-\bar{c}$	$b_{SO}-\bar{c}$	$b_{NN}-\bar{c}$	0	(S,S)
21	0	$b_{SO}-\bar{c}$	$b_{OS}-\bar{c}$	$b_{NN}-\bar{c}$	$(S,O),(O,S)$ and (N,N)
22	$b_{SO}-\bar{c}$	0	$b_{OS}-\bar{c}$	$b_{NN}-\bar{c}$	(O,S) and (N,N)
$\underline{23}$	$b_{SO}-\bar{c}$	$b_{OS}-\bar{c}$	0	$b_{NN}-\bar{c}$	(N,N) and $\underline{(S,S)}$
24	$b_{SO}-\bar{c}$	$b_{OS}-\bar{c}$	$b_{NN}-\bar{c}$	0	(S,S)

Table 9: Payoff Matrix of the Case 2 (especially patterns 19 and 23)

		Player 2		
		S	O	N
Player 1	S	$\boxed{1, 1}$	1.5, 0.5	1, 0
	O	0.5, 1.5	0, 0	0, 0
	N	0,1	0, 0	$\boxed{2, 2}$

Table 10: Characteristics of Subjects (Case 2)

Session	Time	Place	Subjects	Male	Female	Average age
1	June 21, 2012	Aoyamagakuin University	20	15	5	21.1
2	June 28, 2012	Doshisha University	20	11	9	20.4
			40	26	14	20.7

Table 11: Rates of the Strategies that Subjects Adopted (Case 2)

	S (Stay)	O (Others)	N (New)	Total
Sample Number	330	23	447	800
Rate (%)	41.25	2.88	55.88	100

Table 12: Rates of the Combinations of Strategies (Case 2)

	SS	SO/OS	SN/NS	OO	ON/NO	NN	Total
Sample Number	70	14	174	0	9	131	340
Rate (%)	17.50	3.50	44.00	0.00	2.25	32.75	100

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