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## **Articulating Principals, Agents and Institutions in the EU**

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*Principal agent problems arise frequently in situations of interdependence. Europe, with its various arrangements, is replete with principal agent problems that are mediated by institutions at various levels. While issues of water and land can provide a convenient focus, the essential problem is a deeper one.*

*Decision making in principal agent situations has traditionally been considered in only a limited way. Current agency approaches seek to orient the interests of agents to those of the principal. More generalised formulations experience difficulties in reconciling interests. This is apparent not only in two-party forms but even more so in three-part(y) ones. In n-party environments things may appear to become simpler as n increases, but the problem may remain.*

*An innovative exploration of a principal-agent situation which uses object-based concepts and simulations is presented in this paper. Different patterns of agent commitment are seen when it is applied to a European context.*

*Suitable reconceptualisation of agency theory appears to have wide implications and applications. Its further development will allow more adequate specification of agency situations with immediate implications for policy and practice not only in Europe but in nations and regions around the world.*

**Key Words:** Agency Theory, Self-Interested Rationalist, Financial Accounting, Harmonisation, Simulation

## **1. Introduction**

Europe, with its various arrangements and interdependencies, is replete with principal agent problems that are mediated by institutions at various levels. Issues of water and land can provide a convenient focus, particularly the former where streams and catchments physically embed interdependencies with no regard to borders. However the essential problem is a wide one, as can be illustrated by considerations of financial accounting harmonisation. Long standing efforts have seen limited harmonisation results. Complementary management of land and water may well be more difficult.

The essential question is a deep one: how might different agents (and agencies) resolve their principals' interests? If principals were uniform, consistent, clearly communicating and otherwise perfect there would still be a problem due to the role and position of agency. In reality, principals are none of these things. However, for convenience we will here assume that they might be for it is the agency situation that is of interest.

Agents are separate and differently positioned parties to principals. They may have their own interests, information, perspectives, institutions, access and other arrangements. Various asymmetries exist between principal and agent. Such things can be variously captured in a formulation. They can also be seen in the ways that agents react to a common stimulus, as in the ways that National Governments implement an EU Directive. Different patterns of agent commitment are seen in the case scenario, the EU financial accounting harmonisation process.

Formulating and simulating such a situation involves an innovative exploration of the principal-agent situation using object-based concepts. Some findings from a simple specification are presented in this paper. Results show differences between different EU groups and between EU9 and EU15 outcomes. Further development will allow more adequate specification of agency situations with immediate implications for policy and practice not only in Europe but in other nations and regions.

## **2. Casting agents and contexts**

A very limited form of agency, that of the self-interested rationalist, has been in common use (1.1). An alternative form is that of the socio-environmental rational agent (1.2). This alternative form when used in EU contexts allows a more comprehensive consideration of how National agents might react to EU Directives (1.3).

### **2.1 The Self Interested Rationalist, SIR**

In the simplest of agency models, the agency relationship is reduced to two characters: the principal and the agent. The agency relationship is a contract in which one or more persons (the principal(s)) engage another person (the agent) to take actions on his/her behalf which involves the delegation of some decision-making authority to the agent to achieve some pre-determined goal(s) (Jensen and Meckling 1994). The agent will then assume responsibility by expending effort and executing actions (i.e. decision making in an uncertain environment) to meet his or her commitment towards attaining the principal's goal(s). In doing so, the agent will generate and obtain valuable information required by the principal. The principal will reward the agent for attaining the goal(s) specified in the contract and hence, finalising its commitment.

The agent to the relationship, however, is assumed to be a utility maximiser, a self-interested rationalist, SIR. Thus, it is assumed to use the incidence of information asymmetry<sup>1</sup> for its own interests (Jensen and Meckling, 1976: 5). That is, the agent will select those actions that are in its interests given the compensation scheme offered by the principal. This does not align with the interests of the principal unless the principal incurs the costs of monitoring the agent's behaviour and/or aligning agent incentives with those of the principal so that information is not manipulated.

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<sup>1</sup> The information possessed by the agent is valuable but unavailable to the market and principal, without which the market cannot identify the true nature of the activities (Barnea, Haugen and Senbet, 1981: 9). This inequivalent distribution of information is termed the incidence of information asymmetry (Butterworth, 1987: 187).

While agency problems are taken to exist in all organisations and in all cooperative efforts (Jensen and Meckling, 1976: 7; Jefferies and Johnson, 2002: 2), the assumption of self-interested rationalist (SIR) behaviour has had limiting consequences. The model correctly predicts particular phenomena under investigation in only the simplest of instances, and even in the simplest of instances there are cases where the simple agency model has limited success (Temel 2005). While the hypothesis of self-interested rationalist (SIR) behaviour may be apt in some contexts it may be misleading or inadequate in others. This is especially so when the narrow interpretations of self-interested rationalism are used in agency.

## **2.2 The Socio-Environmental Rational Agent, SERA**

An extended conceptualisation of agent behaviour is introduced in Temel (2005). This addresses the context of agent behaviour, the socio-environment, within which the agent interacts. The context particularly refers to the institutional affiliations and interactions of the agent. Each individual is shaped and moulded in accordance with their socio-environment. That is, each individual's interpretation of their socio-environment and involvement in that socio-environment will influence their identity. Individuals may then use rational calculations in selecting what aspect will influence their identities (Finnemore and Sikkink, 2001: 410). Rationality can, thus, also be informed by the socio-environment and not just by self-interest. An individual (in some practical sense) can be rational and yet justify and/or undertake actions with other motivations, impulses, interests or needs in mind.

Self-interested rationality may be intended but it may not necessarily always be achieved. There are clearly wider social factors at play in the rationality of individuals (Tankersley, 2000). It is thus probable to suggest that in making decisions or performing activities individuals use their *socio-environmentally-constructed rationality*. The agent is now assumed to use their socio-environmental rationality transmitted via their institutional involvement to reason and make decisions (Temel (2005)). The potential of institutional affiliation and interaction lies in its ability to complement rational choice theories by showing how belief systems affect individual (agent) behaviour (Temel (2005)). It is through affiliating and interacting with these

institutions that an individual's beliefs about the state of the environment are influenced and hence, their behaviour accordingly. This influence will vary from individual to individual depending upon the extent or level of their affiliations and interactions, which is informed by the power and variability of the institutional influence. This agent is termed a socio-environmental rationalist agent (SERA), which can be contrasted with the self-interested rationalist (SIR) agent in the existing agency literature.

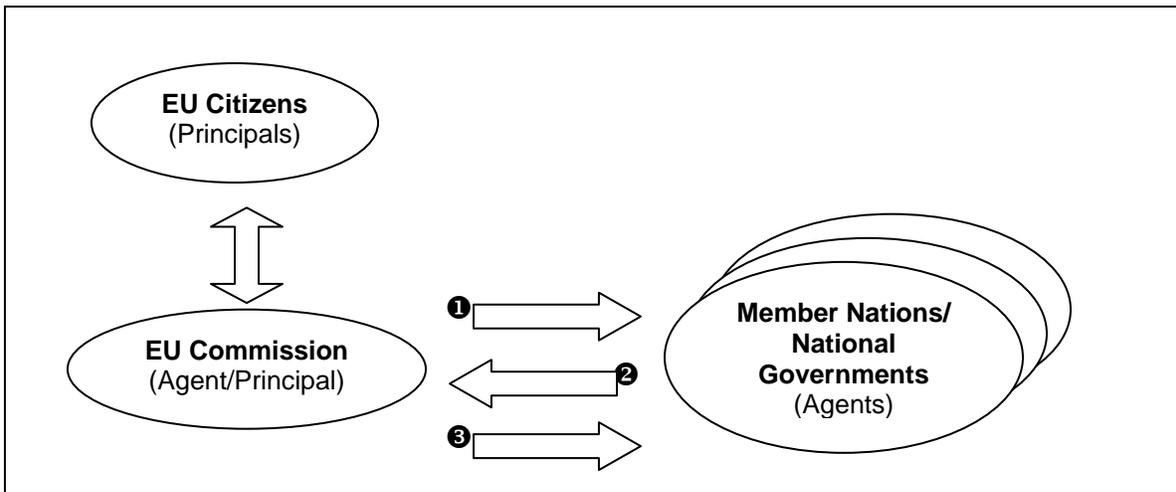
### **2.3 The European Union (EU): a Context for Agency**

In the context of the EU, the citizens of Europe can be considered the principals and each of the respective member nations' governments are the ultimate agents. The citizens engage their governments to act on their behalf towards achieving a common European market for goods, services, labour and capital via an electoral contract (an initial referendum and national election), which transfers the delegation of decision making authority to the national governments. It is, however, difficult for citizens themselves to monitor the behaviour of national governments. EU organisations (e.g., EU Commission, EU Council, and EU Parliament) are employed to do so – much like the shareholders and board of directors' scenario in the context of a corporation. The EU case is a case of multiple agents and dual parties. The European Commission is the dual party<sup>2</sup>: it is both an agent to the citizens (the principals) and a principal to the member nations (the agents). This is depicted in Figure 1 below, which presents the application of this multi-agent dual party relationship within the context of the EU.

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<sup>2</sup> A dual party is a party that can represent both a principals and agents. The EU Commission as an agent to EU citizens (the principals) it has the responsibility to administer and monitor the implementation of the EU Financial Accounting Directives on behalf of the EU citizens (Harris, 2000: 54). As a principal to national members (the agents) it provides the necessary resources (i.e., some monetary funding, a forum and legislative backing) for the national governments – who are expected to have the resources, ability, knowledge and the skills to employ them – to achieve the goal of financial accounting harmonisation.

**Figure 1 - Framing the EU as an Agency Relationship**



Source: Temel 2005: 94

The focus will be upon the relationship between the EU commission and member nations (the lower portion of Figure 1). Once the citizens of each member nation agree to join the EU they hand over their collective welfare in nominated areas to the EU Commission to act on their behalf. The transactional process between the EU Commission and member nations then commences.

In the first transactional process (labelled 1 in Figure 1), the EU Commission provides the necessary resources (the incentives, the forum and common legislative backing) to the national governments to achieve the goal of financial accounting harmonisation. Each member state has control of the resources and is delegated the responsibility of ensuring that their behaviour (i.e., employment of resources) adheres to the goals and the ethos of the EU (presented in Article 52 to 58, and especially Article 54(3)(g)) of the Treaty of Rome 1957). Therefore, in the second transactional process (labelled 2 in Figure 1), each member state contracts to adhere to the policies set up to ensure that a common European market for goods, services, labour and capital is established and equivalent safeguards are provided. Finally, in the last transactional process (labelled 3 in Figure 1), each member state is provided with a reward for adhering to such policies and committing to the goals of the EU. Rewards would be continuing membership, perhaps some incentives, and

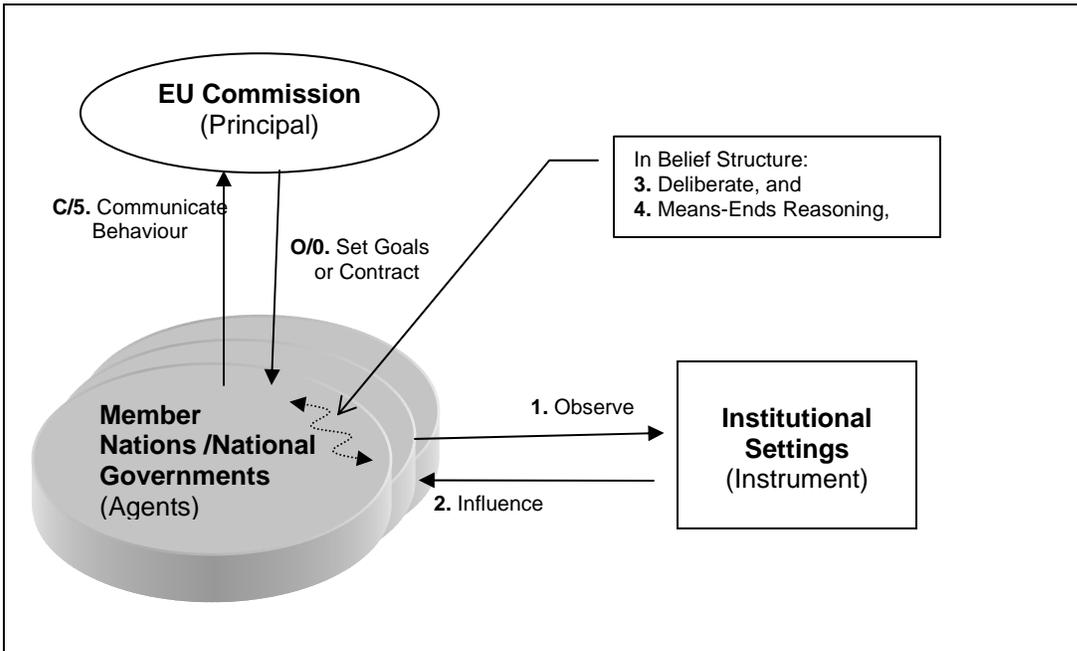
access to benefits brought about by union such as the increased flow of goods, services, labour and capital between member nations.

Once integration begins, member states would find that progress towards greater integration would facilitate the pursuit of their own goals. These states would then pressure their governments to take further steps towards integration. The additional steps would in turn stimulate further pressure for more steps, and the process would continue. Should the EU environment continue to be framed in the traditional agency sense each member state would be expected to adopt and adhere to the financial accounting policies within the Directives that maximise their own utility and to reject those that do not.

## **2.4 SERA in the EU**

Should the EU case, on the other hand, be framed in the context of socio-environmental rationalism, it is expected that the behaviour of respective member nations (the agents) would reflect their institutional settings. Institutions are the instruments of the interaction influencing agent behaviour in the principal-agent relationship. Hence, the agents (member nations) rather than adopting and adhering to financial accounting policies representative of their self-interest, will adopt and adhere to those policies in accordance with their institutional setting. Figure 2 below depicts and explains the application of the socio-environmental rationalist agent (SERA) behaviour to the EU–Nation context. Each member nation after initiation of the collective transaction (labelled 0 in Figure 2) engages with their national institutional settings (demonstrated by the arrows labelled 1 and 2 in Figure 2) regarding the type of behaviour to be presented. This then influences each respective nations belief structures (labelled 3 and 4 in Figure 2), and finally their commitment towards harmonisation (labelled 5 in Figure 2). In summary, the institutional force present within the principal-agent relationships (EU Commission and member nation relationship) acts on the agents, influencing their behaviour positively or negatively towards the attainment of the principal’s goal(s) through their belief structure.

**Figure 2 - Framing EU-Nation Interaction as an Socio-Environmental Rationalist Agency Relationship**



Source: Temel 2005: 182

The following sections will now focus on the broader context of the interaction. This involves an examination of the EU financial accounting harmonisation process in light of self-interested rationalist (SIR) agent and socio-environmental rationalist agent (SERA) conceptualisations.

### **3. The European Union (EU) and Financial Accounting**

#### **3.1 Background**

The historical origin of accounting regulations in Europe, being the legal prescription or the professional governing of accounting, can be traced back to 17<sup>th</sup> Century France (Gulin, Ferdo, Vasicek and Lajos, 2002: 3). Through the Napoleonic Wars French mandatory requirements (Napoleon's Trade Law from 1807 prescribed the obligation to draft the balance sheet and the profit and loss account as per the *Code de Commerce*) were transported through to continental Europe. This was the beginning of accounting regulations harmonisation at the European level.

After the hostilities of World Wars I and II, the Treaty of Rome 1957 established the European Community (EC now named the European Union, EU) and initiated the comings of the harmonisation of the national regulations. While being the second historical phase of financial accounting harmonisation in Europe, it represented the beginnings of EU financial accounting harmonisation.

EU Member States agreed to harmonise their company laws 'to co-ordinate the safeguards' contained therein 'for the protection of the interests of members and others ... with a view to making such safeguards equivalent' (Treaty of Rome Article 52 to 58, and especially Article 54(3)(g)). This agreement stemmed from an understanding that, stakeholders and business activities could benefit from the harmonisation of corporate laws and regulations governing financial accounting rather than through confinement to their national regulations. Confinement was thought to be prejudicial to the workings of a common European capital market giving rise to not only interpretation and analytical problems, financing and compliance costs for European multinationals, but also inequivalent safeguards for European multinationals.

In the 1970s, the European Commission formally attempted to reduce national variations in corporate regulations through the harmonisation of financial accounting standards (Joy, 1996: 17). Harmonisation was to be achieved through all member states implementing a series of Company Law Directives<sup>3</sup> issued by the Commission. The framework and details of these Directives initially resting heavily upon the Germanic approach to financial accounting were later redrafted to the Anglo-Saxon approach to accommodate the arrival of the United Kingdom (UK) and Ireland as new members in the EU (Walton, Haller and Raffournier, 1998: 14; Walton 1997; Diggle and Nobes 1994; Nobes, 1993: 165). Although these Directives have been implemented in every EU member state, a harmonised European financial accounting system is yet to develop.

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<sup>3</sup> A Directive is legislation binding on all EU member states, requiring incorporation into national law (Harris, 1999: 58). The incorporation of the EU Directives into national law is a complex, lengthy process, the method of implementation being left to the discretion of national authorities (Choi, Frost and Meek: 1999: 267). The Directives provide the framework for implementation wherein member states may exercise flexibility in applying national accounting standards and may add additional requirements where appropriate (Iqbal, Melcher and Elmallah, 1997: 22).

Significant variations in accounting rules and practices still exist in European countries, in part because of national interpretations in implementation.

### **3.2 Financial Accounting Harmonisation in the EU**

The EU Commission has attempted to achieve harmonisation through the issuance of Company Law Directives<sup>4</sup>. Of the Directives, the Fourth Directive and Seventh Directive deal exclusively with financial accounting issues and standards, and are also the most controversial of the Directives. According to Walton, Haller and Raffournier (1998: 14) the EU Directives were inadequate in integrating the mixture of principles and practices drawn from different countries and different traditions towards a common basis.

One particular experience open to examination relates to the adoption of the ‘true and fair view’<sup>5</sup>. The adoption of the ‘true and fair view’ indicates a diversity of responses with inadequate attempts to integrate or standardise European practices. Given the underlying assumption of agent behaviour in the existing Agency literature (i.e., self-interested rationalism) nations should not adopt the policy given its inadequate representation of member states’ financial accounting practices. Alternatively, given the assumptions of socio-environmental rationalism member nations should adopt the ‘true and fair view’ that is in accordance with their institutional settings. Actual practices show clear national interpretations of a posited common European standard. So what informed this adoption: self-interested rationalism or socio-environmental rationalism?

The ‘true and fair view’ concept originated in the UK and represented a significant departure from the previous draft requiring the more common Germanic approach

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<sup>4</sup> Note that the EU has used ‘Directives’ (where nations interpret and legislate) rather than ‘regulations’ (where nations uniformly implement). The former are ‘European framework laws’ while the latter are ‘European laws’ under the proposed new constitution (McDonald and Deardon: 2005: 33). Clearly agency issues and problems are much more likely or feasible with Directives.

<sup>5</sup> The ‘true and fair view’ is a requirement that the financial statements be prepared in accordance with and present a ‘true and fair view’ of the financial operations and position of the enterprise. Any application of the provisions of the directives which do not represent a ‘true and fair view’ are to be overridden or departed from, and an alternative procedure which represents a ‘true and fair view’ is to be adopted (Article 2(5) of the Fourth Directive).

(Walton 1997; Diggle and Nobes 1994), which required financial statements to conform and adhere to the legal principles of proper bookkeeping (Nobes, 1993: 165). Essentially, the 'true and fair view' is a highly subjective concept requiring the exercise of professional judgment on behalf of the accountant or auditor (Walton, 1995: 217). While being officially recognised in the documents, there is no interpretation of its meaning in the statutes or the Directives, nor has it been the subject of judicial interpretation (cf., the German approach which encompasses the use of rigid and detailed rules and regulations as a basis for account preparation) (Gray and Coenenberg, 1984: 101). Consequently, the 'true and fair' concept has been interpreted in different ways in different EU member countries, both linguistically and philosophically (Alexander and Nobes, 1994: 105).

This implies that a number of different financial statements could give a 'true and fair view' of any particular state of affairs or profit or loss, frustrating harmonisation efforts in the EU. This is neither in the self-interests of the nations (agents) nor the EU Commission (principal), as it creates disharmony and may impede investment and capital flow between nations. The question here is why are nations opting not to adopt the 'true and fair view' in its entirety, even though it is a lax requirement (allowing a substantial degree of flexibility) through which its implementation would improve harmonisation efforts. An application of the existing assumptions of Agency theory would suggest that it would be in the best self-interest of agents (member nations or national governments) to do so. Applying standards with regards to their institutional settings may be a possible explanation?

The 'true and fair view' is not the only aspect of the Directives that has been applied in diversity. Standards that are stipulated by the EU Commission for implementation have been circumvented and the alternatives to the stipulated policy have been adopted. Under the Fourth Directive alone, there are more than 30 optional areas that provide alternative ways of implementation (Joy, 1996: 19). Similarly, options exist in the Seventh Directive on Group Accounts in areas such as: the definition of a subsidiary/concept of a group; exemptions from consolidation; valuation methods across group accounts; research and

development (R&D) and the recognition of goodwill<sup>6</sup>. This is only a limited sample, as according to Gray, Coenenberg and Gordon (1993: 35) there are fifty-one obvious options. If they are all assumed to be yes/no options, Gray, Coenenberg and Gordon (1993: 35) extrapolate that this means there are  $2^{51}$ , that is, ‘two zillion’, ways of implementing the Seventh Directive.

The most controversial topic of the Seventh Directive is the concept/definition of a group. The concept/definition of a group for consolidation purposes was not formalised in the text of the Directive (Flower and Lefebvre, 1997: 343). The term ‘group’ is not mentioned and instead a number of conditions for the preparation of consolidated accounts are specified. These conditions relate to the legal concept of control<sup>7</sup>. Member states, however, may choose to go beyond this mandatory provision, and consolidate accounts in accordance with the optional concept of economic control<sup>8</sup>. Each member state may tailor its requirements by choosing certain options and rejecting others, incorporating certain aspects of the legal concept of control and some or all aspects of the economic concept of control.

For example, with the early development of the stock exchange in the UK, the requirements emphasise the existence of a *de jure* (legal power) to control through share ownership. In Germany, with a greater portion of corporations subject to family ownership and extensive banking facilities, the requirements emphasise the existence of *de facto* (economic) management control (Radebaugh and Gray, 1997: 257). Some

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<sup>6</sup> Goodwill is the difference between the cost of the investment to the parent and the value of the subsidiary’s net assets at the time the investment is purchased. Goodwill arises when the parent pays a premium for acquiring the shares of the subsidiary (Newham, 1984: 65). That is, the parent company anticipates greater benefits than fair market value of net assets acquired for example, an added team of executives will bring about a major synergy or certain patents lend themselves to higher profit potential (Mueller, Gernon and Meek, 1997: 25).

<sup>7</sup> Article 1.1 of the Seventh Directive requires consolidation where the parent undertaking has the ‘legal power to control’ the subsidiary, which is presumed to exist in four cases: (1) the holding of the majority of the voting rights; (2) the right to appoint or remove a majority of the board of members; (3) the right to exercise dominant influence pursuant to a contract or provision in the articles of association; and (4) the holding of a majority of the voting rights pursuant to an agreement with the shareholders (Flower and Lefebvre, 1997: 348).

<sup>8</sup> Article 1.2 of the Seventh Directive stipulates economic control exists if a parent undertaking has a participating interest in the subsidiary and either: (a) the parent actually exercises a dominant influence on the subsidiary company; or (b) the subsidiary and parent undertaking are managed on a unified basis (Flower and Lefebvre, 1997: 349).

countries have been more imaginative than others in their interpretation of the Directive in that their interpretation have given rise to various ways in which the boundaries of a group may be demarcated (Radebaugh and Gray, 1997: 343). At this present time, no two countries apart from the UK and Ireland have an identical accounting group concept (Radebaugh and Gray, 1997: 343). This provides a clear demonstration of the key role that institutions can play in influencing the behaviour of member nations, as agents in EU principal-agent relationships.

According to the principles of the existing theory of Agency, each EU member nation being an agent is a self-interested rationalist (SIR) seeking to adopt those policies that maximise national utility. Given this, nations should then undertake those actions that would increase their share of the rewards of economic union such as, increased capital mobility and efficiency, and increased investment and comparability. These rewards could only eventuate through the implementation of a harmonised financial accounting system. The degree of diversity continuing to persist in EU financial accounting (demonstrated in the discussions above) does not reinforce or support the notion that member nations are acting in accordance with such a simple mode of self-interested rationalism. Diversity is not in the best interests of member nations (the agents) or the EU citizens (the nominal principals). Why would some nations depart from the stipulated standards to adopt alternatives that increase diversity in EU financial accounting, which are contrary to the apparent interests and utility of both agents and principals? An examination of the 'true and fair view' and the definition of a 'group' demonstrate that institutional<sup>9</sup> influence may be instrumental in member nation behaviour. This is examined further in the context of agency.

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<sup>9</sup> The relevance of institutions in understanding accounting policy choices and adoption is supported in an earlier study by Temel (2000) which demonstrates that societal institutions were the social channels through which cultural values were transmitted to the accounting system and hence, the driving force for the diverse adoption of EU Directives (Temel 2000).

## **4. Implementing SERA using an Object Orientated Approach**

The research presented is conceptual and theoretical in nature with an extended case application. It applies the existing and extended conceptualisation of agent behaviour in the theory of Agency to the case of EU financial accounting harmonisation.

### **4.1 Methodology**

Such a focus will, however, require the adoption of a non-traditional research methodology<sup>10</sup>. This methodology focuses on examining the object and its context (i.e., the agent and its environment), and not just on the defined predictive capability of the object's (agent's) behaviour. A methodology that adopts this approach is the object-orientated (OO) methodology. In light of this research an OO approach aids:

1. Conceptualisation of the object's concepts,
2. Development of a model of the constructs of the conceptualisation, i.e., a frame of application, and
3. Implementation and evaluation of the conceptualisation of the object.

An OO method that implements this approach is simulation. Simulation involves constructing a dynamic model of a real system for the purpose of experimentation (Edwards, 1992: 45). The EU as an agency relationship is a state of the real world that will be portrayed through the process of simulation. The context of the relationship will be manipulated to explore and infer about agent (member nation) behaviour in the relationship and the contextual influence itself.

The EU financial accounting harmonisation process represents a simulation of multiple-cases. The multiple cases are of member nations (multiple-agents) in their differing accounting contexts. The simulation of this multiple-case will allow for cross-case

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<sup>10</sup> The principal agent problem has been extensively developed in a particular paradigm, one influenced by positivism. The positive-agency literature has generally been empirically orientated, focusing essentially on predictability. This approach has dominated research in the theory of Agency (Jensen and Smith, 1985: 2). For example, a substantial portion of the literature in agency has focused on the predictive capability and objectivity as criteria for judging the usefulness of the theory.

analysis from multiple perspectives, approaches and data. The data utilised in this application process consists of secondary data which may exhibit both quantitative and qualitative characteristics. Examples of data that utilised include: legal standards and requirements, parliamentary debates, speeches written agreements. Simulation outcome data, the results generated from the simulation, also constitute research data. Presentation of simulation results is both visual and quantitative.

## **4.2 Simulation Procedure**

Simulation through the use of computational software is conducted. The chosen software package for this research is NetLogo.<sup>11</sup> In the simulation, agents are presented with variations in their institutional environment:

- *InstnPow*, institutional power possessed by institutions, and
- *InstnUncern*, uncertainty/variability in institutional influence.

These affect their level of commitment towards achieving the principal's goal.

There are four agent groups in this simulation, each one representing the accounting systems operating within the EU. These agent groups are the:

1. Anglo Saxon Agent Group
2. Germanic Agent Group
3. Latin Agent Group, and
4. Nordic Agent Group.

The simulation consists of a minimum of nine agents representing the initial nine EU members and is labelled the pre-expansion phase in EU membership. The maximum number is 15 agents representing the later six adjoining members and is labelled the first

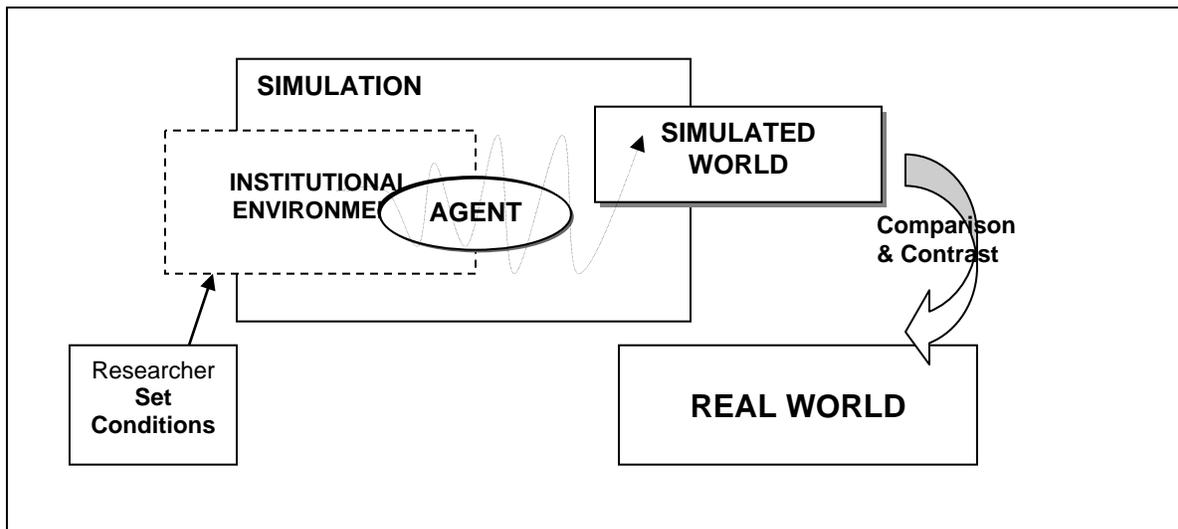
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<sup>11</sup> NetLogo is an agent-based parallel modelling and simulation environment produced by the Centre for Connected Learning and Computer-based modelling at Northwestern University (Evans, Heuvelink and Nettle, 2003: 1). It is a programmable modelling environment for simulating complex natural and social phenomena developing or emerging over time (Johnson, 2001: 165).

post-expansion phase in EU membership. The simulation is therefore run twice: part 1 represents the pre-expansion phase in EU membership (or EU9), and part 2 represents the first post-expansion phase in EU membership (EU15).

The simulation involves a replication of the world with conditions set by the researcher using sliders. The sliders set much of the environment in which the agent interacts and deliberates about its behaviour. Given the set conditions the simulation is programmed to generate a possible reflection of agent behaviour that may result if the set conditions occurred in the world. The results obtained therein are compared and contrasted to the agent's actual behaviour in the real world (demonstrated by the directional arrow feeding forward to the real world in Figure 3). This is their existing commitment towards achieving the principal's goal given the state of their real world.

**Figure 3 – Operation of Simulation**



Source: Temel (2005: 220)

The workings of the simulation can therefore be summarised by a relationship:

$$C \sim R(P) \text{ given } D\#$$

That is, the communication of final commitment is dependent upon an agent's reactions to perceptions (informed by their institutional environment) given their deliberations.

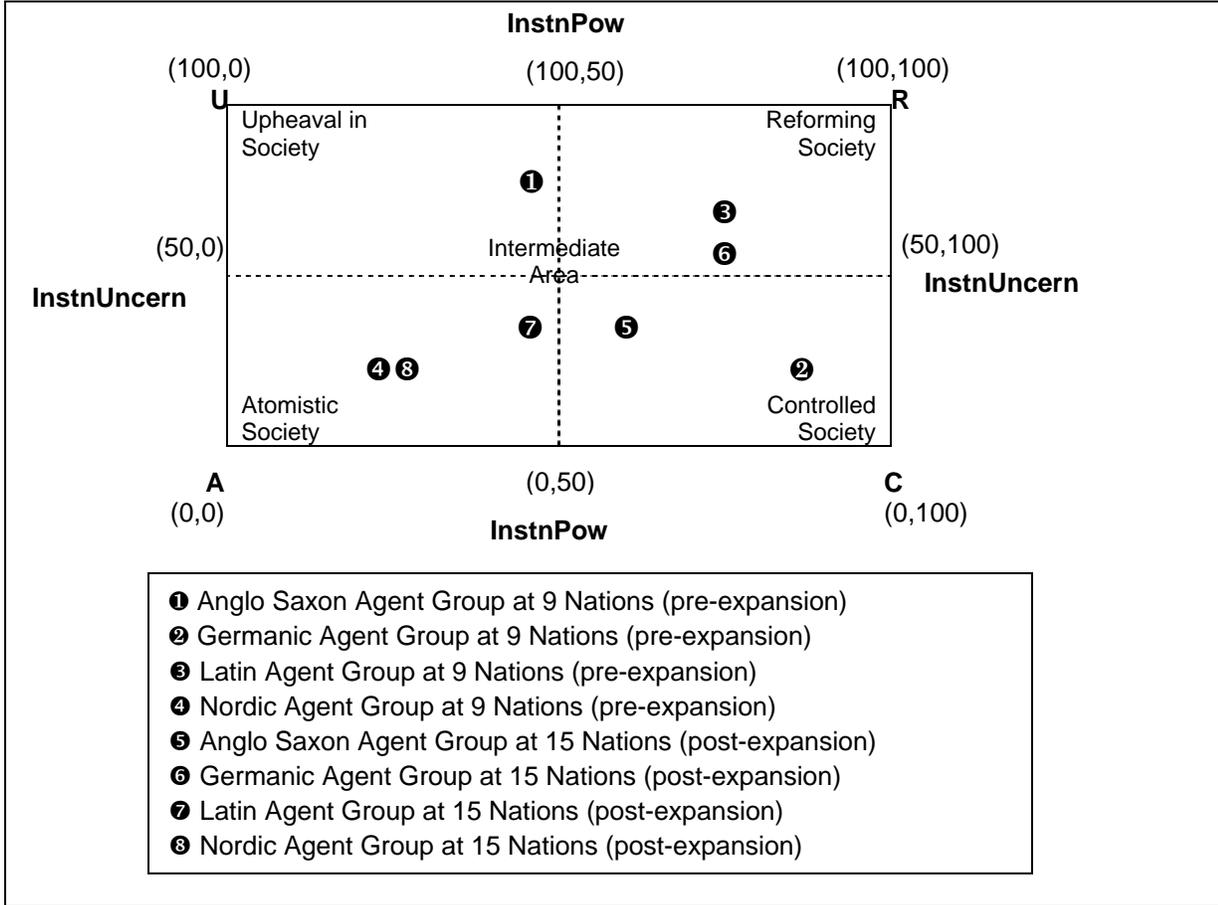
### **4.3 Specification**

A matrix of institutional dimensions, presented in Figure 4, is used to analyse the contours developed from the results. This matrix presents a measure of institutionally influential societies based upon the extent of influential power exerted by institutions (*InstnPow*), and the extent of uncertainty or variability in institutional influence (*InstnUncern*). These institutional variables were used in the simulation to vary the environmental conditions (over a range, nominally 0 to 100) of the agent.

The type of society pertaining to the coordinates of the intersecting variables is written into the corners of the quadrants square where the coordinates are located. The points towards the corners exhibit a stronger association to the assigned society type. The area towards the centre exhibits a weaker association to the assigned society types, and is labelled the intermediate area. A matrix quadrant is assigned to each agent group given their institutional setting at the pre-expansion and post-expansion phase of EU membership (refer to Figure 4). This matrix represents the box plot floor of the 3D contour graph at  $y = 0$ . Therefore, only the portion of the contour contained within the assigned quadrant of the box plot will be analysed.

Having identified the areas of the contours to be analysed for each agent group it is now necessary to examine the contours themselves. Two particular agent groups have been selected for analysis: the Anglo-Saxon Agent Group and the Latin Agent Group.

Figure 4 - Agent Positioning within the Matrix of Institutional Dimensions



Source: Temel (2005: 265)

## 5. Simulation results

The commitment of EU groups for varying levels of insitutional influence was simulated. Distinctive results for Anglo-Saxon and Latin Groups in the EU9 and EU 15 are reported visually and statistically.

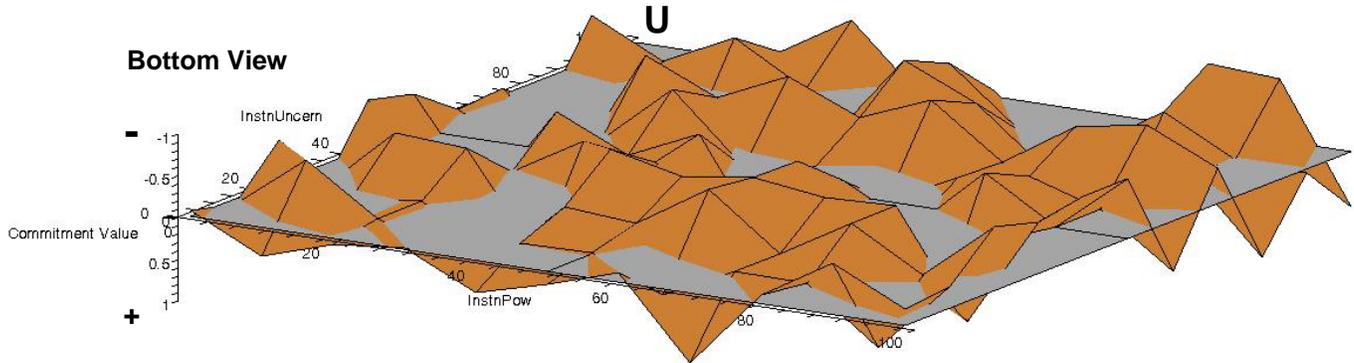
## **5.1 Visualisation and Analysis of the Anglo-Saxon Agent Group**

Final commitment values given the *InstnPow* and *InstnUncern* coordinates for the EU9 and EU15 simulation are shown for the Anglo-Saxon agent group in Figure 5. The analysis begins with the examination of the coordinates of the ‘upheaval in society’ (U) and the areas surrounding these coordinates. The peaks protruding from the bottom view of this division appear numerous in number (Figure 5a). The overall behaviour of the agent within this division therefore has an inclination towards negative commitment. These results are synonymous with the agent’s stance towards harmonisation upon initiating membership with the EU. While the Anglo-Saxon agent group at the time could see the benefits of harmonisation, they were unable to entrust their system to foreign standards and hence, enforced the introduction of standards suitable to their system. Hence, there is the overall portrayal of negative commitment in the examined quadrant.

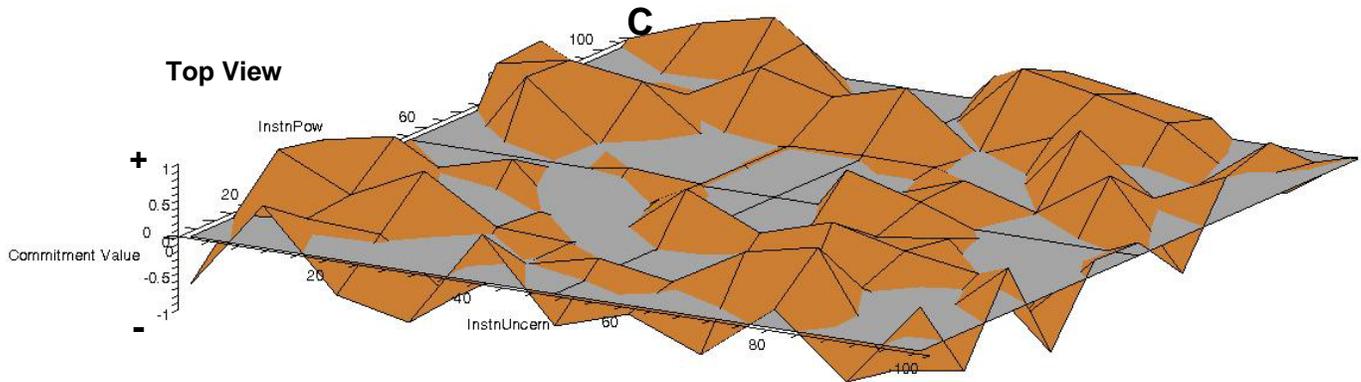
The coordinates that require closer examination for the Anglo-Saxon agent group after the first post-expansion phase relates to the coordinates of a ‘controlled society’ (C) and the areas surrounding these coordinates. The peaks protruding from the top view of the division are clearly more numerous in number (Figure 5b). The overall behaviour of the agent within this division therefore has an inclination towards positive commitment, which is the exact opposite of the overall behaviour presented in the pre-expansion phase of EU membership (see Figure 5, and above). These results are synonymous with the agent’s current stance towards harmonisation within the EU. The improved strength and stability of the UK and the ongoing success of the EU (demonstrated by the expansion in EU membership) fostered the development of a positive attitude towards harmonisation and hence, the maintenance of a positive level of commitment.

**Figure 5 3D Contour Graph of the Anglo Saxon Agent Group Commitment Values at its Intersecting InstnPow and InstnUncern Values**

**A Part 1 EU9 Inverted**



**B Part 2 EU15**



Source: Temel 2005: 268, 270

What the above analysis has demonstrated is that an agent group's commitment levels can be altered by variations in the *InstnPow* and *InstnUncern* variables. In the first post-expansion phase of EU membership the increased stability and strength of institutional settings enable the exhibition of a positive default commitment. The presence of a number of positive and negative peaks, and the variability of the peaks demonstrate that changes and variations in the *InstnPow* and *InstnUncern* variables affect the commitment of the Anglo-Saxon agent group.

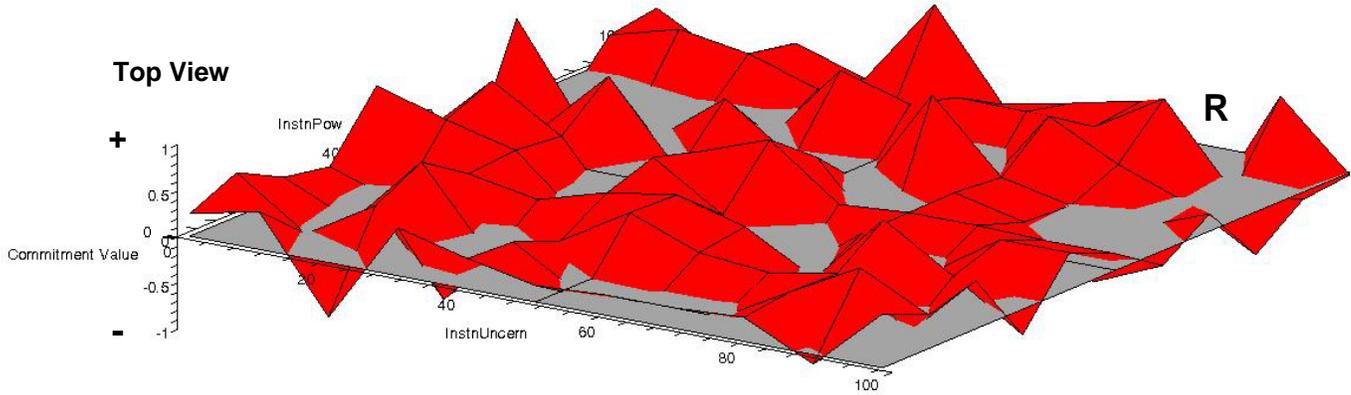
## **5.2 Visualisation and Analysis of the Latin Agent Group**

The contour graphs in Figure 6 represent the Latin agent group's final commitment values given the *InstnPow* and *InstnUncern* coordinates. The analysis will begin with the examination of the coordinates of the 'reforming society' (R) and the areas surrounding these coordinates. The peaks protruding from the top view of this division are clearly more numerous in number (Figure 6a). There is in fact a positive trend with limited negative escapes. The overall behaviour of the agent within this division therefore is of positive commitment. This parallels the agent group's stance towards harmonisation upon initiating membership with the EU. This particular agent group consists of France the initiator of and solicitor for unification across Europe. Hence, it is expected that there should be the exposition of a strong positive commitment.

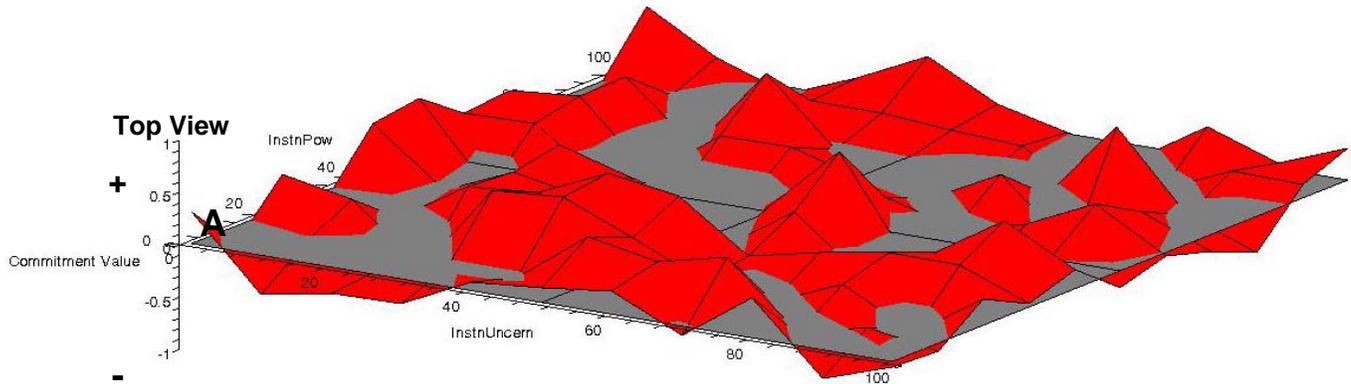
The coordinates that now require closer examination for the Latin agent group after the first post-expansion phase relate to the coordinates of an 'atomistic society' (A) and the areas surrounding these coordinates. The peaks protruding from the top view of the division are also clearly more numerous in number (Figure 6b). The overall behaviour of the agent within this division therefore also has an inclination towards positive commitment, which supports the behaviour presented in the pre-expansion phase of EU membership (Figure 6a, and as discussed above). This is synonymous with the agent's ongoing stance towards harmonisation within the EU.

Figure 1 - 3D Contour Graph of the Latin Agent Group Commitment Values at its Intersecting *InstnPow* and *InstnUncern* Values

A Part 1 EU9



B Part 2 EU15



Source: Temel 2005, 272 and 274

This and other analyses demonstrate that an agent group's commitment levels can be altered by variations in the *InstnPow* and *InstnUncern* variables. In the post-expansion phase of EU membership the easing of speculation and the introduction of supporting members into the group further supported the maintenance of positive commitment. The presence of a number of lesser negative peaks, and smoother peaks has demonstrated that changes and variations in the *InstnPow* and *InstnUncern* variables affect the commitment of the Latin agent.

The varied responses of the agent groups are a result of their varied institutional settings, that is, the stages that they were and are at in the matrix of institutional dimensions, and the relative importance their institutional influence plays within their environment. Given that each agent group is positioned in dissimilar dimensions of the matrix (i.e., in the pre and post expansion phases in EU membership) and have distinct levels of influential institutional importance, it is not unexpected that disharmony in EU financial accounting eventuated and persists today.

### 5.3 Statistical Analysis

A statistical analysis of the overall commitment values for all agent groups is now necessary to complement the visual analysis performed and to provide the numerical grounding for the visual results. Results from the simulation (Table 1) appear broadly in line with the current condition of harmonisation in the EU. Mean EU commitment falls slightly from 0.061 to 0.52. Individual commitment values are widely dispersed but narrow with expansion (except for the Anglo Saxon group), with overall variance of 0.204 for part one and 0.130 for part two.

**Table 1 - Descriptives of Final Commitment (*finalcomm* (Ca)) Values from Simulation One and Two**

Simulation Part and Agent Types	Minimum	Maximum	Mean	Std. Deviation	Variance
Part One	-.86283	.97267	.06061	.45176	.204
Part Two	-.86124	.95350	.05182	.36037	.130
Anglo Saxon Part 1	-.86069	.90969	.02686	.44036	.194
Anglo Saxon Part 2	-.86124	.90343	.02244	.45197	.204
Germanic Part 1	-.86283	.95344	.03671	.60957	.372
Germanic Part 2	-.84046	.95350	.06479	.42408	.180
Latin Part 1	-.80091	.97267	.10086	.35109	.123
Latin Part 2	-.65233	.72460	.05977	.24954	.062
Nordic Part 1	-.75000	.89374	.07802	.35279	.124
Nordic Part 2	-.75535	.79321	.06027	.26874	.072

Source: Temel 2005: 290

Table 1 also provides dispersion details for each nation or agent group. It is at their means and variances that the agent groups vary significantly. The Anglo Saxon agent group and Germanic group varying significantly in comparison to that of the Latin and

Nordic groups (refer to Table 1; the variance column). Given that the Anglo Saxon and Germanic agent groups were of those in strong opposition to the method and system to be used in harmonisation, the variability in commitment is expected. The Latin and Nordic groups, on the other hand, being more relaxed sought to achieve commitment with little reluctance and hence, have varied less in their efforts.

A one-way analysis of variance (ANOVA)<sup>12</sup> presented in Table 2 below confirms that there is significant difference among the mean final commitment values of the agent groups in part one and part two of the simulation – that is, the final commitment values exhibited is related to agent group types. This analysis has thus demonstrated that each agent group has a varied level of final commitment even with all group agents facing similar circumstances/conditions and with the addition of new members. This is synonymous with the current status of EU attempts towards financial accounting harmonisation. Each nation in the EU has assigned themselves a different level of commitment towards harmonisation through the Directive procedures they have chosen to implement informed by their institutions. There is no uniformity in commitment towards harmonisation. This is likely to continue to be the case even with the planned and further addition of new members into the EU. The relativity of the nations’ circumstances proves to be driving force not the numbers.

**Table 2 - ANOVA of Two Analyses of Variances for Each Simulation Part**

<b>Simulation Parts</b>	<b>Sum of Squares</b>	<b>Df</b>	<b>Mean Square</b>	<b>F</b>	<b>Sig.</b>
<b>Part One</b>					
Between Groups	4.396	3	1.465	7.207	.000
Within Groups	983.181	4836	.203		
Total	987.577	4839			
<b>Part Two</b>					
Between Groups	1.411	3	.470	3.628	.012
Within Groups	627.002	4836	.130		
Total	628.413	4839			

Source: Temel (2005: 291)

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<sup>12</sup> In performing the Analysis of variance (ANOVA) tests, a p-value less than the 5 per cent level of significance would indicate that the value for the F statistic is significantly large and thus, the null hypothesis would need to be rejected and the alternate hypothesis accepted. The null hypothesis here is that there are no significant differences between the agent group variances in commitment values.

## **6. Implications for Harmonisation**

### **6.1 EU Financial Accounting**

The results presented above demonstrate that the EU case for financial accounting harmonisation is synonymous with the socio-environmental rationalist agent (SERA) conceptualisation of agent behaviour. A number of implications follow.

The first of the implications to be examined pertains to the articulation of the EU case using the extended conceptualisation of agent behaviour. The articulation has demonstrated that the institutions within EU member states have been effective in influencing the direction of European integration. These developments have serious implications for the future of the EU and for European integration in general. This is especially the case with the ongoing widening and deepening of the EU. Unless efforts are directed towards appreciating the varying differences in institutional influence efforts towards harmonisation within the EU will be in constant disarray.

European financial reporting will remain fragmented, thereby hampering the development of a deep liquid single EU capital market. Diversity in financial accounting practices affects the capital market decisions of investors and issuers acting as a restraint on cross-boarder investment much like a non-tariff barrier and thus, handicapping the development of the single capital market. As a method of corporate communication, an investor may be reluctant to buy shares if he or she finds the accounts strange and mystifying in comparison to their home country accounts. Alternatively, a European company may be reluctant to raise capital else where in Europe if it has to spend resources adapting its accounts for French investors. With the widening and deepening of economic integration in the EU, the inconsistency in EU financial accounting practices could be substantially harmful. Regions of disparity with regards to finance are established.

## **6.2 Wider implications**

This brings to questions the issues outside financial accounting harmonisation, those pertaining to trade laws, environmental laws and land and water usage. Financial accounting harmonisation in the EU can serve as an example from which to extrapolate. The variability present in efforts towards attaining a uniform system of financial accounting, due to institutional differences, serve as an indicative measurement of harmonisation on alternative fronts. For example, the development of the single monetary union (SMU) represents an interesting case, or even the implementation of food standards across the EU, and allocation of community aid both represent troubling areas across the EU. Disparate regions have been established in the EU that are more conducive and lucrative to growth, investment and trade based on their stance towards uniformly implemented rules (converse is true). For example, a member nation with a strong presence of the environmental preservation is more likely to strictly adhere to the regulations preserving land and water than a member nation with a weaker presence. This strict adherence imposes higher costs for industrial growth.

With the accelerating pace of business, the need for a more dynamic and responsive legislative framework for unification of European regions is ever increasing. It is important, particularly for reasons of ongoing performance and cohesion, that each Member State move towards harmonisation at a pace appropriate to that individual country. Change through the implication of uniform standards can not be enforced but rather facilitated through understanding the influential factors responsible for instigating and responding to change. This could be an effective means through which a joint goal can be ascertained in the diverse regions within the EU.

## **7. Conclusion**

An innovative exploration of a principal-agent situation which uses object-based concepts and simulations was presented in this paper. Different patterns of agent commitment are seen when it is applied to a European context. The extent of this is dependent upon the institutionally specific variables of institutional power and institutional variability. Both variables presented varied effects upon agent groups.

The SERA conceptualisation of agent behaviour appears to have wide implications and applications. Its further development will allow more adequate specification of agency situations with immediate implications for policy and practice not only in Europe but in nations and regions around the world.

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