

Reinterpreting socio-economic processes: A systems view of decentralisation in Indonesia

ABSTRACT

The complexity of social systems is characterised by the possible occurrence of simultaneous or sequential processes of structural change. This paper is particularly focused on certain types of structural change: *(i)* those produced by assembling and disassembling and *(ii)* those resulting as a consequence of decisional and/or behavioural process, including both bottom-up and top-down processes. Moreover, decentralization is used here to illustrate these processes, presenting the well-known story of Indonesia's remarkable transition to a democratic society and decentralised economy. But here the story is presented in an alternative way to identify types of structural changes in real-world events. Ultimately, this paper highlighted the instability that characterises transition periods. However, in the case of Indonesia, it is the transition that allows the country re-organise itself from its previous rather stable state (i.e., centralised Indonesia) to a democratic nation with decentralisation laws.

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1. Introduction

As suggested by the name itself, systems theory is a theoretical and empirical framework dedicated to the interdisciplinary study (and commonly control the dynamic behaviour of the system) of systems. To define a system is not an easy task since, on one hand, there is no single definition of a system, and on the other hand, 'system' is an abstract concept based on a rational procedure that allows us to distinguish a phenomenon. In general, one can argue that a system is comprised of any set or combination of real and/or imaginary elements or parts that are interconnected, thereby forming a whole. The concept of wholeness is, indeed, one of the main concepts behind system theory.

In a system, the relationships between these elements are commonly defined as cause-effect mechanisms, and therefore, the system is considered to be a closed and deterministic whole. One probable reason for this consideration is that social systems have been considered similar to any other natural phenomena, and in accordance with this tradition, any kind of social system is assumed to adhere to the laws of exact sciences. Whether or not the aforesaid assumption are justified, the fact remains that on one hand, social systems exhibit complex features, while, on the other hand, the general system approach (i.e., the one that applies to natural sciences) provides many helpful clues for understanding social systems. In particular, social systems exhibit distinct properties that are not deducible from the properties of the isolated parts; these are the so-called emergent properties.¹ Many examples of complex systems include social systems (from living individual beings themselves to human societies), economies, civilisations,

nations and so on. Usually, social systems, particularly economic ones, are subject to constant changes. Emergence is a natural phenomenon that involves an unfolding of change over time, as very often systems show so-called “emergent” features not previously observed. These new features give rise to revised or new structures within the system, known as structural change. Despite the inherent complexity of any social system, the system approach helps in developing guidelines and techniques for a better understanding of social processes and policy implications.

This paper reviews some concepts from systems theory and particularly focuses on two specific types of structural change: (i) those produced by assembly and disassembly, and (ii) those resulting from bottom-up versus top-down decisional and/or behavioural processes.² All these concepts offer a different interpretation of processes of change as well as permit a better understanding of socio-economic systems. The next section (Section 2) presents a theoretical introduction that defines these key terms.

In particular, this paper examines the dynamics of structural change arising out of a country’s political and economic decentralisation processes.³ The case of Indonesia is analysed in the last two sections (Section 3 and 4) as a concrete example of decentralisation. Indonesia presents several unique characteristics, including its complex geography, large multi-ethnic and multi-religion population, as well as its colonial heritage. Indonesia's decentralisation, which took place following the Asian crisis and the sudden collapse of Soeharto's regime in 1998, clearly illustrates the dynamic, multi-dimensional process of structural change and the intrinsic complexity of political, economic and social relations during the democratisation and economic development of a country. Indonesia decentralisation has in fact become of great contemporary

interest for academics and non-academics alike, and it has been generally examined critically, since country's decentralisation has led to inefficient and ineffective governance and inadequate growth. However, Indonesia is examined here not only because of current interest in its decentralisation, but also because it clearly illustrates the two types of processes of structural changes considered here, that is, assembling versus disassembling and top-down versus bottom-up processes. Ultimately, this paper presents an alternative version of the well-known Indonesia's decentralisation story whereby some outcomes of this process are examined under a systems view perspective.

2. The essentials of structural change processes

2.1. Systems theory: basic concepts

For the purpose of this paper, it is important to define general (and sometimes abstract) concepts that characterise structural change processes, including assembly versus disassembly and bottom-up versus top-down. While avoiding debates about specific definitions, some brief comments about these terms are necessary.

A 'system' is commonly defined as a set of parts with relations among them (Bertalanffy, 1968; Ackoff, 1971; Casti, 1979; Skyttner, 2001). In other words, a system is a set of linked and interdependent parts, elements or components.⁴ Systems, especially social ones, are constantly changing. These changes may be quantitative and/or qualitative. Qualitative changes, which typically require simultaneous quantitative changes, are defined as 'structural change.' In particular, both the parts and relationships within systems have 'properties' that are expressed in 'values'. When these values change in one or more parts and/or relationships through the parts

and their relationships remain the same, the system maintains its identity, and the change is only quantitative. In this case, parts and/or their relationships remain the same. However, structural change appears when the identity of the system changes (Domingo and Tonella, 2000: 212). In particular, structural change takes place when some parts and/or relationships disappear, change or appear anew.⁵

Two other terms that help define systems include the concept of the environment and the concept of models; Figure 1 summarises some of these definitions. All the things related to the system that do not belong to it comprise the 'environment' of the system. This notion becomes clear when the concept of models is considered. A model is a representation of a system that involves the use of a particular approach and/or method. Models (e.g., verbal descriptions, graphic representations, mathematical definitions and so on) are constructed to understand and evaluate a system. They are also tools to solve problems related to a system. In this way, the modeling process involves choosing the parts and relationships that are inside and outside the system (i.e., forming the environment). Therefore, a model will be only one of the many representations of the system; it will be an arbitrary specification of the parts, their relationship and their properties. Whenever one looks at a system, one is looking at a particular model or representation (i.e., a bounded reality). For example, this paper describes democratised and decentralised Indonesia; as a nation, Indonesia is a geographical entity in which political, economic and social processes take place.

[Figure 1 about here]

2.2. Assembly and disassembly processes

There are different processes of structural change, the most obvious being those produced by assembly or disassembly. The former refers to those processes in which various elements unite to form a whole (or a system); i.e., a process in which an assembly of parts takes place. The latter is the result of the disaggregation of a whole (or a system) into elements (parts or other subsystems); in other words, one or more parts are decomposed from the system, and as a consequence, the system itself decomposes as well. Figures 2 and 3 illustrate these two processes.

[Figure 2 and 3 about here]

In the process of assembly, which includes setting up a new system, certain new properties that were not present in the single parts appear in the whole. These new properties are called ‘emergent properties’ (see Section 2.6). These properties are the results of the interaction between parts within a system, which may lose or gain properties and relationships when they unite into the new system. Alternatively, the process of disassembly involves similar processes. Here the system is split into two or more elements or separate subsystems. The properties of the whole may disappear altogether, as they may no longer characterise the single parts, and the parts or subsystems may gain or lose properties or relations. Domingo and Tonella (2000: 213-4) presented an elucidatory example of the assembly and disassembly processes:

The bricks, assembled in a wall, lose mobility and gain reactive forces that they apply to other bricks: the wall displays a size and shape not present in the individual bricks. If the wall is dismantled by separating its bricks, the reverse process of disappearing and appearing properties will happen. [...] the loss of mobility is caused by the force-transmitting properties of the unions (by friction or sticking) and the elastic and gravitational interactions between the entity that apply the force, the brick, the wall and the earth. The explanation is based in laws of elementary mechanics, but when details are analyzed it is by no means trivial. With these laws and properties the immobility and its limits could be explained and even predicted

before any observation of them. In general, the explanation of the emergent properties is very complicated as compared with the simple test of the presence of these properties in the whole. (Domingo and Tonella, 2000: 213-4).

The outcomes of assembly and disassembly processes are not easily distinguishable. This is often the case when one deals with complex systems, particularly economic and social systems, while these processes do not occur in less complex systems such, as the wall and bricks example. In the latter, the causes that produce new properties are based on the laws of mechanics,⁶ which can explain the new properties of the wall (e.g., immobility) even prior to construction.

The drivers of these assembly and disassembly processes are usually called ‘actions’ or ‘forces,’ which in turn may be endogenous or exogenous (Domingo and Tonella, 2000: 214). The interaction among existing parts of a system may generate a process of self-assembly.

In addition, and primarily in closed systems, endogenous processes may be accelerated or slowed through self-reinforcing or self-extinguishing interactions, respectively. Although these processes produce changes in the system, they are (at least in the short-term) only quantitative variations, which eventually may trigger qualitative or structural changes. Self-reinforcing mechanisms play a key role in economics, especially in markets and firms. The most common self-reinforcing processes include the relationship between food and population growth as well as those generated by advertisements or propaganda from companies, political parties, religious organisations, military recruiters and so on.⁷

The complexity of socio-economic systems is characterised by the possible occurrence of simultaneous or sequential processes of structural change. Thus, many of the above processes,

including assembly and disassembly, may take place through either self-reinforcing or self-extinguishing actions either at the same time or sequentially. They may also occur in combination with distinct decisional and/or behavioural processes described below.

2.3. Top-down and bottom-up processes

Once the system is formed through the assembly process, its parts interact. This interaction often generates endogenous processes in which the whole system (or a subsystem) affects the parts or vice-versa. The interaction is 'bottom-up' whenever relationships between parts have consequences for the whole system. In contrast, when the whole system (or a subsystem) determines the behaviour of the parts by restricting or allowing certain properties and/or relations between them, the interaction is called 'top-down'. These two processes are represented in general terms in Figure 4.

[Figure 4 about here]

Top-down and bottom-up processes, which are observable in many social systems, can occur in existing systems or may drive structural change. The distinction becomes intuitive when one thinks of dictatorship and democracy. In a dictatorship, the government is ruled by one person or a single political party that exercises its power in a top-down manner. In a democracy, the power is vested in the people, and political sovereignty is driven largely by bottom-up decisional processes that are directed by citizens.

Top-down and bottom-up mechanisms, particularly in the social sciences, are understood to be closely related to decision-making processes, and they are commonly used to define the organisation of a system. Moreover, defined as strategies, bottom-up and top-down mechanisms

have been used to set and coordinate actions in economic systems in order to achieve certain goals and objectives. Top-down strategy can encourage an action plan based on objectives imposed from above and is a holistic strategy of centralised control. On the contrary, bottom-up strategy starts from elements at individual level and moves upwards.

The definition and execution of strategic plans of governments and companies can be viewed in terms of combinations of top-down and bottom-up strategies.⁸ The utilisation of these strategies is not mutually exclusive, and they are often used in a complementary manner. This can be observed in many governmental strategies throughout history. For instance, the centralised public budgeting process implements both top-down and bottom-up strategies. While budget allocation (e.g., among regions, provinces, cities and so on) is decided in a top-down fashion, for reasons of practicality, the actual management of public expenditures (e.g., procurements and investments) is undertaken in a bottom-up manner and carried out by each single region.

2.4 Selected processes of structural change

The basic processes of structural change, including assembly versus disassembly and top-down versus bottom-up, can take place separately or in simultaneous or sequential combination. It is common in fact that they occur in combination; this is especially true in socio-economic systems. So, bottom-up or top-down processes may result in the assembly of parts to form a system or in the disassembly into parts to form different systems and vice versa.⁹

There are particular types of assembly versus disassembly and top-down versus bottom-up combinations. The top-down processes that involve assembly and the bottom-up processes that

involve disassembly are so-called integration and diversification processes, respectively. Integration (or, in extreme cases, forced unification) occurs when top-down processes results in the assembly of one or more parts into a more homogeneous system. Diversification occurs when bottom-up processes disassemble parts to become more independent and diverse units, which then perform new activities, have new goals and so on. An extreme result of the later process is the complete disintegration of the system.

Although the processes of integration and diversification take place usually through top-down or bottom-up processes, respectively, there are examples in which different combination are possible. Both integration and diversification could be the outcome of bottom-up and top-down processes. There are bottom-up processes that may assemble parts into more homogenous systems. Examples would include the formation of cooperatives or families through marriages.¹⁰ Alternatively, there exist top-down processes that generate diversification, such as a policy to induce competition. As reviewed in Section 3, the decentralisation process is in fact one good example of top-down diversification. The central government induces (through a top-down strategy) administrative and fiscal decentralisation to increase local autonomy and potentially leverage on each region's unique resources and capabilities.

Moreover, there are types of processes that involve bottom-up responses to balance top-down actions (see Section 2.5). Responses may also take place through further assembly or disassembly. One common effect of bottom-up responses as a mechanism to balance top-down actions involves agreements between the parties as a result of an assembly process. There are

numerous examples of these patterns of structural change that can be observed across many fields and domains, some of which are presented in Table 1.

[Table 1 about here]

2.5. Adaptive and evolutionary change

As mentioned in the previous section, deliberate or enforced top-down or bottom-up actions may result in either unification or disintegration and thus produce remarkable changes in social or economic systems. For example, the forced unification of a country may be the result of top-down action by an autocrat or the military, which may paralyse the society. Alternatively, some bottom-up processes may result in the destruction of the system. However, there are systems that react to top-down actions by generating bottom-up responses and vice versa. In these cases, the top-down and bottom-up actions are not strong enough to destroy or paralyse the system, and thus, the system can progressively generate responses.¹¹ Usually, when a top-down or bottom-up process takes place, the results involve changes described in the previous sections (i.e., assembly or integration and disassembly or diversification). But when there is a continuous trade-off between top-down and bottom-up processes, the result includes adaptive and evolutionary changes (see Figure 5).

[Figure 5 about here]

Adaptation is, in biological terms, a process of change to fit into a changing environment.¹² Evolution refers to the process of gradual, progressive change or development. These two concepts can be used as metaphors to describe social processes.¹³ Adaptation, which generally

implies evolution, is a key concept in economics and is often used to interpret competitive dynamics in certain types of markets. However, according to Kiel (1994: 13-4), adaptation is an inappropriate term when applied to the generally monopolistic settings of government agencies and services, even if government must respond and adjust to citizen demands. This is the notion of public management as reliant on an incremental model of changes seems to be more suitable to explain sequential shifts or incremental change. This notion implies only quantitative changes, and it is related to equilibrium-based change.

Although adaptation and evolution allow system stability (that is, order or balance), there are systems in which processes such as self-organisation may take place. Social systems in general have the internal capacity to reconfigure themselves after episodes of drastic change. According to Kiel (1994: 15), rather than falling back to a previous state of equilibrium, these systems 'self-organise' into new form of order and ways of contending with their environments. Thus, they transform through instability, and this change is qualitative, as the system evolves into another form.

In this way, the social processes of change continuously alternate between order and disorder (or so-called chaos), since the organisation of the systems is moving towards new ways to achieve goals. This has been called the adaptation and production of new structures at the 'edge of chaos' (Kauffman 1993: 189–208). The evolution of societies is a good example, since it is based on the bottom-up balance between the diversity of individual behaviour (produced by genetic changes, the environment and roles) and the top-down unifying forces of education and socialisation (Domingo and Tonella, 2000: 218).

All these concepts (adaptation, evolution and balance) can be understood together in terms of the so-called ‘complex adaptive systems.’ Complexity theory and the overlapping but separate theories of chaos and self-organisation reflect this focus on complex adaptive systems, since these systems are related to the emergence (see Section 2.6) generated by nonlinear modes of organisation (Eve, *et al.*, 1997: 31-2). Stacey (2007: 195) defined complex adaptive systems in organisational terms as follows:

A complex adaptive system (Gell-Mann, 1994; Holland, 1998; Kauffman, 1995; Langton, 1996) consists of a large number, a population, of entities called agents, each of which behaves according to some set of rules. These rules require each individual agent to adjust its action to that of other agents. (Stacey, 2007: 195)

Based on this definition, it is possible to distinguish the top-down and bottom-up processes involved: individuals interact (bottom-up) and adapt to each other by following simple rules (top-down and/or bottom-up), and in doing so, they form new systems (assembly). This, according to Stacey (2007: 195), can be thought of as a population-wide pattern.¹⁴ This kind of dynamic is intuitive when one thinks of decentralisation processes. In the case of Indonesia, provinces, cities, and, in general, individuals organised themselves (bottom-up) to the new laws and regulations imposed by the central government (top-down). The decentralised laws represented a dramatic change that implied (and still implies) disorder as well as the reconfiguration of the nation through self-organisation and adaptation (see Section 3).

Another related concept is reproduction. This is also a biological term that is useful to understand top-down and bottom-up processes. Reproduction is the process among organisms by which new individuals are generated and the species is perpetuated. In relation to this paper, reproduction is the capacity of a system to produce a multiplicity of similar objects. This might happen as a consequence of certain top-down or bottom-up processes in which the system (*i*) produces

similar objects or (ii) disassembles into parts that keep the system's properties. The franchising model is an example of the production of similar objects, because the franchisees replicate the business model and the trademark of the franchisor. Meanwhile, decentralisation is a good example of a disassembly into parts that maintain some of the system's properties, whereby each part (that is, provinces and lower-local government levels) reproduces many of the central government's roles and activities.

Finally, in most of the above examples (including those presented in Section 2.4), it is possible to recognise an organisational hierarchy among the parts within the system. Processes of structural change may involve different organisational levels. Various combinations of processes may take place at one level, generating changes in different organisational levels. Domingo and Tonella (2000: 219) underlined the importance of organisational hierarchy on structural change analysis:

[...] in many cases, structural changes are unexpected, because the usual observation is made at one level and the change is triggered off by processes at different levels. A socio-political revolution may surprise the authorities that observed the apparently regular social and political facts, but, at local and individual levels, changes are taking place in opinions, expectations, and perceptions of many individuals. These create a hidden structure that abruptly emerges in the whole. (Domingo and Tonella, 2000: 219).

The combination of all processes described, including assembly versus disassembly and top-down versus bottom-up, triggers a wide range of structural changes. Each of these processes, or combination thereof, involves the creation of emergent properties, and hence, the social systems dynamic is led by successive and frequently unexpected structural changes. This intuition is confirmed by many examples in political and economic history and in everyday life. One can therefore claim that the principles and ideas of systems theory permit, when applied to concrete situations, a better understanding of many dynamic social systems. The following section

examines many of these mechanisms in the context of Indonesia's political and economic decentralisation policy.

2.6 Emergent properties

All of the above processes may generate emergent properties. Emergent properties constitute new properties that a system exhibits that are different from the properties of the isolated parts or from the properties of the same parts arranged into a different system.¹⁵ Identifying and explaining the origins of emergent properties is difficult, since they are neither the result of any single event nor follow any specific rules.

According to Morin (1977, Vol. 1: 121), a system is something more than just the summation of its isolated parts. As a result of an assembly process, the resulting system acquires (i) an organisation or structure, (ii) unity or totality (the *Gestalt*) and (iii) new qualities or properties that emerge from the whole.¹⁶ In this way, these properties cannot be easily deduced or estimated *a priori* from the properties of the elements of the system. One reason is because emergent properties imply a sort of novelty and thus involve features not previously observed.

Moreover, this concept is close related to system hierarchies that were mentioned in the previous section. Emergent properties refer to global patterns (or global-level structures) that arise from local interactions. Contemporary complexity theorists focus on how global structure arises not just from local interaction but also from interactions based on relatively simple rules. Yet the rules do not, in themselves, predict global behaviour and structure (Eve, *et al.*, 1997: 31). It is possible to identify systems in which assembly (or disassembly) is the goal of a plan or a project

(or top-down resolution). In these cases, assembly (or disassembly) takes place as a result of a deliberate plan and becomes the outcome of a decisional process, which happens to be top-down. However, even with extensive planning, emergent properties can often not be entirely foreseen. A good example of these kinds of interaction is the decentralisation case presented in the following section.

3. Decentralisation and the case of democratic Indonesia

The term ‘decentralisation’ embraces several dimensions, including political, legal, administrative, fiscal and market aspects. In general, these procedural dimensions of decentralisation take place sequentially, for example, beginning with deliberate political and legal changes and followed by administrative and fiscal decentralisation. However, the detailed sequence and dynamics of the decentralisation process are often difficult to predict, since structural changes occur simultaneously across these multiple dimensions. Moreover, the dynamics and impacts of decentralisation along these different dimensions may differ across countries. Each country has its own distinct history, institutional set-up, as well as unique context and timing with respect to the implementation of reforms.

Nevertheless, since decentralisation involves qualitative institutional and organisational changes, it always implies structural change. In particular, all decentralisation cases involve top-down and bottom-up actions and decisions as well as assembly and disassembly processes (see Section 2). All these aspects can be observed when analysing the Indonesian case study in which the multiple dimensions of decentralisation jointly impact the country’s political, economic and socio-cultural institutions.¹⁷

Indonesia is the world's largest archipelago and fourth most populous country; it enjoys a high degree of economic, ethnic and cultural diversity. Indonesia's democratisation and decentralisation processes have had a wide-ranging impact on the country's political, economic and socio-cultural institutions. Therefore, Indonesia has become the focus of great contemporary academic interest. Yet, this country is examined in this paper not only because of this current interest but also because the examination of Indonesia's multi-dimensional decentralisation process (i) clearly illustrates the two types of processes of structural changes considered here (see Section 2), (ii) shows how certain patterns of change can be actually determined in complex systems even if they are erratic by nature, and (iii) provides insights that permit a better understanding of social systems. This analysis may ultimately shed more light on Indonesia's decentralisation —since it offers a different version of the story— and it also helps to explain certain processes that maintain Indonesia's *status-quo*.

3.1. The beginning: Indonesia pre-1998

After more than three decades of authoritarianism and strong centralised control, Indonesia experienced a drastic democratisation process in 1998 with Soeharto's forced resignation.¹⁸ The 1997 Asian financial crisis deeply affected Indonesia's economy. The countermeasures taken by Soeharto under pressure from multilateral agencies had eroded domestic confidence in the regime. However, in the first year following democratisation, no major changes took place in terms of decentralisation, even though one of the consequences of the ouster of President Soeharto was a rise regional dissatisfaction. When the Soeharto regime came to an end and his vice-president Jusuf Habibie came to power, a number of provinces rich in natural resources (including Riau and East Kalimantan) expressed dissatisfaction because of perceived unfair

central government revenue allocation. Together with the ongoing political separatist movements in Aceh and Papua, this pressured President Habibie and the People's Consultative Assembly to formulate the so-called 'decentralisation laws.' Social systems are constantly changing, and any change implies further successive changes ranging from radical to evolutionary shifts. In Indonesia's case, any change from autocratic oppression, including regional dissatisfaction and Soeharto's resignation, triggered further changes.

In fact, the beginning of the Indonesian decentralisation story already showed multiple structural change processes, as discussed in the previous section. The democratisation process in Indonesia began through a bottom-up process to balance the historically authoritarian and absolute top-down control. Demonstrations and riots of the so-called Indonesian 'May Revolution' of 1998 were a response to 'balance' the Soeharto's regime policies and crisis countermeasures (e.g., autocratic and centralised control, widespread and ingrained corruption, repression of student movements, IMF-imposed austerity measures that resulted in severe economic hardship and so on). This bottom-up response to top-down suppression represented the culmination of years of regional dissatisfaction and regionalist movements with Soeharto's forced resignation. All these, especially the regionalist movements, led to the country's subsequent democratisation and decentralisation, including a gradual disassembly into political and economic units.

The nature of the relationship between the central and local governments during Soeharto's regime reflected the authoritarian and centralised nature of the government.¹⁹ Soeharto's regime represented, in all its dimensions, an example of the unification of parts (i.e., islands, provinces, districts and municipalities) into a system (i.e., a country) that resulted from the prevalence of

top-down control of the geographically-administered structure of the country and the similarly centralised, top-down budgetary arrangement.²⁰ These two dimensions of centralism demonstrate integration (i.e., a unity and homogeneity of parts) by top-down assembly. In particular, Indonesia was administratively divided into provinces headed by appointed governors, which in turn were divided into districts and municipalities headed by local regents and city mayors, respectively. Even if the legislative bodies at central and regional levels were elected, their role was mainly of an advisory nature reflecting the high degree of centralised decision-making.²¹ From a budgetary and fiscal perspective, regional and local governments were dependant on central government budgeting guidelines, fund allocations and transfers.²² Clearly, the dominance of Soeharto's central apparatus (top-down) helped to administer and control the country as a unified system.

Social systems in general are capable of reacting to top-down stimuli, inducing bottom-up responses and, consequently, multiple assembly and/or disassembly processes. As observed in many episodes throughout world history, the preponderance of top-down regimes that maintain centralised control often results in failures and the ultimate disintegration of such systems (see Section 2.4). This is clearly demonstrated in the case of Indonesia. Despite a positive track record of economic growth and development, the top-down concentration of the regime's power created a deliberate and fragile state of unity that ultimately forced Soeharto's resignation and the end of his thirty-two years regime when confronted with severe economic crises and political pressures.

The disassembly process continued along regional dimensions during Soeharto's successor government. During Habibie's government, increasingly vocal separatist movements, pressures from resource-rich and ethnically diverse regions, conflicts among political parties and severe economic crises weakened his capacity to govern the country. These factors induced centrifugal and disintegrative forces (bottom-up disassembly), which led Habibie government to focus on political and economic decentralisation as a high-priority national issue.

As pointed out by Asanuma and Brodjonegoro (2003: 111-2), a number of provinces expressed dissatisfaction with the way in which the central government had been treating them. They demanded broader regional autonomy than envisaged, including the devolution of power and fiscal decentralisation. Some demanded that the unitary state be changed into a federal state, while others demanded independence from Indonesia. The increasing demand for broader regional autonomy was the response to the strong centralisation of power and fiscal resources by the central government during the previous three decades.

Furthermore, considering the geographical, economic and socio-cultural organization and history of the country, decentralisation became an almost natural bottom-up reaction to the centralised power concentration. Several factors helped trigger and accelerate this bottom-up (and ultimately disintegrative as well) process. In particular, the pressure from resource-rich provinces²³ to control larger portions of the revenues generated by their own oil, gas, agricultural and mineral resources was one of the more important mechanisms that affected and initiated political, administrative, fiscal, economic and industrial decentralisation. Reforms aimed at decentralisation were the Habibie government's response, which was subsequently endorsed by a

number of foreign governments and multi-lateral agencies, to accommodate the demands and pressures from resource-rich provinces and regional separatist movements.

3.2. The “big bang” of decentralisation

Laws 22/1999 and 25/1999 were the starting points of the extensive and drastic decentralisation process in Indonesia. The reason behind the issuance of these two laws was the attempt to counter the potential breakdown of the unity of Indonesia (i.e., the potential disassembly of the system accelerated by self-reinforcing mechanisms). Law 22/1999 provided the basis for political and administrative decentralisation, while Law 25/1999 was the basis for fiscal decentralisation. In particular, according to Law 22/1999, financial resources must be aligned with decentralised government functions, while Law 25/1999 should provide the financial resources for the implementation of 22/1999. So, Laws 22/1999 and 25/1999 provided the basis for a phase-based decentralisation, and they triggered an unstable period (which still exists at present) of implementation and reforms, which in turn has triggered further changes in programs.

The initial challenges faced by the government when it started implementing the decentralisation program demanded further legislative steps.²⁴ The revision of Laws 22/1999 and 25/1999 took place through Laws 32/2004 and 33/2004, respectively. Law 32/2004 on local government introduced direct elections at the district and municipality levels. Appendix 1 outlines the shift to direct elections and the progressive change in the nature of relationships of the central and local executive and legislative bodies.²⁵ The revision of Law 25/1999, namely, Law 33/2004, did not introduce any drastic changes except for providing more details on intergovernmental transfers and placing more emphasis on local financial management.

As stated in Law 22/1999 (Article I, Letter 3), decentralisation refers to the transfer of authority to regulate and govern the interests of local people to the government of autonomous regions.²⁶ One notable characteristic of Indonesian decentralisation is the devolution of power and authority from central government to the second-tier levels of local governments, that is, the district (*kabupaten*) and municipal (*kota*) levels. This is quite drastic in light of the fact that Indonesia previously had a very centralised and strong top-down government.²⁷ In principle, the devolution of power and administrative roles fits the main purpose of any democratisation and decentralisation process, which is to bring government closer to the people. Nevertheless, it is notable that Indonesia's political and administrative framework has remained the same compared to the pre-decentralisation period. The changes instead took place with respect to the delegation of power and authority. In particular, the organisation of local government and policy decision-making shifted from a top-down exercise of power by the central government to a bottom-up exercise of it by the local governments. As a consequence, even if the basic profile and designations were and are still valid, an extensive structural change process was initiated, which is still ongoing today.

Law 25/1999 on the fiscal balance between central government and the regions focuses on fiscal decentralisation or, more explicitly, on the intergovernmental fiscal system. Four categories of regional government revenues were defined, namely, natural resource revenue sharing, tax sharing (especially property tax), general funds, and special allocation funds (DAU and DAK, Indonesia acronym). The most significant changes are associated with the establishment of the latter ones —the balanced allocation funds. These changes arose as a consequence of the introduction of a revenue-sharing system related to the exploitation of natural resources and the

reorganisation of the transfer system. The new transfer system is based on a general grant called the general purpose allocation fund (DAU), which replaced the previous grants and now makes up 25% of net domestic revenue in the central government budget. DAU replaced the historical central government grants to the regions and lower governmental levels, including the *Subsidi Daerah Otonom* (SDO) and the *Instruksi Presiden* (INPRES) grants. DAU is therefore gathered together old grants giving full discretion to local governments to spend these funds according to their own priorities through bottom-up decision-making.²⁸

However, this new central-local budgetary and fiscal arrangement works in a peculiar way. On the one hand, for efficiency reasons, the transfer of power from central to local government seems to require that political and administrative decentralisation be accompanied by fiscal decentralisation and, hence, bottom-up budgetary arrangements (i.e., both funding with respect to both revenues and expenses). On the other hand, fiscal revenue sharing was (and still is) limited to the sharing of property taxes, higher resource sector revenue allocation as well as relatively minor local taxes and retributions, including, for example, taxes on advertising boards and garbage dumps. This revenue sharing has not involved the sharing of more lucrative income and corporate taxes, and therefore, the most important tax revenues are still monopolised by the central government (Kuncoro, 2006: 27).²⁹

As mentioned in previous sections, in every system (i) top-down processes may result in assembly or disassembly processes, and (ii) a change in the rules (and/or goals) affects the dynamic of each of the parts of the systems, which then affects the performance of the whole

system. In Indonesia, the decentralisation laws have generated a disassembling and diversification process in which the parts of the system became more independent and distinct.

In summary and from a systems view, Indonesia (i.e., the system) has implemented in a top-down manner a set of new rules to reorganise the structure of the government, namely, decentralisation laws and democratisation. Change in the rules has affected the dynamic of each of the parts of the systems (i.e., provinces, districts and municipalities), which in turn affected the performance of the whole country. Moreover, the systems developed new rules and thus new ways to redistribute revenues and wealth. However, previous centralised processes in terms of actions and behaviour still prevail in driving the system. As a result, this has created a multiplicity of possible outcomes that does not always result in the system's goals of decentralisation; rather, there is an ongoing sequence of successive top-down processes with bottom-up responses.

3.3. Ongoing democratisation and decentralisation: Indonesia post 1998

From the perspective of basic structural change processes (assembly versus disassembly and top-down versus bottom-up), one may summarise some of those 'surprising' outcomes (that is, emergent properties) of Indonesia's democratisation and decentralisation. In the following paragraphs, some examples are discussed with particular focus on political, administrative and fiscal decentralisation.

The most visible but surprising outcome of Law 22/199 is a good example of emergent property. The introduction of this law has produced a change in the political and administrative division of

the country.³⁰ The devolution of power and authority from the central to local governments, including districts and municipalities, was exacerbated by the desire of the regional and local governments to gain more autonomy; this process in turn triggered the proliferation of new provinces, districts and municipalities. Since then, the number of units for each tier has been subject to change almost every year. Prior to the decentralisation laws, Indonesia had 26 provinces and around 310 districts and municipals. Within a period of four years from 1999 to 2004 as shown in Table 2, these numbers increased to 33 provinces plus 440 districts and municipals. This administrative disassembly process has continued as an increasing number of local ethnic groups are now demanding their own jurisdictions. The recent riots for an independent Tapanuli province, which is currently part of the North Sumatra province, provide one example. In fact, by the end of 2008, the number of districts and municipalities had increased to more than 490.

[Table 2 about here]

The formation of new local governments, including districts and municipalities, not only implied disassembly but also involved reproduction, as disassembled parts (i.e., new districts and municipalities) reproduced the function of other existing parts within the system.³¹ A further important example of the disintegration process in Indonesia is the 2002 separation and independence of the former Portuguese colony, East Timor. Thus, the separation of East Timor can be seen as part of the country's overall disassembly process into independent and dissimilar parts. In this particular case, disassembly was a result of bottom-up ethnic separatist responses to many years of military suppression, further aided by the interests of the international community.

Another clear example of an emergent property involves one consequence of Law 25/1999 on fiscal decentralisation. This is specifically related to changes in the natural resource revenue-sharing schemes. According to Law 25/1999, there are four types of natural resource revenues to be shared among central, provincial, district and municipal governments: oil and gas, mining products, forestry products, and fishery products. As can be seen in Appendices 2a and 2b, the country's natural resource revenues make up a very large component of the country's GDP (25%) and its exports (46%). Within the natural resources sector, oil, gas and mining contribute three quarters of the overall resource sector's GDP and two thirds of resource sector exports.³² Since Law 25/1999 significantly increased the percentage of revenues from the mining, forestry and fishery sectors to be transferred to the local district and municipal governments (see Table 2), the main beneficiaries of the fiscal decentralisation law are districts and municipalities richer in oil, gas and mining resources, such as East Kalimantan, Riau, Papua, South Sumatra and Aceh (see Appendix 3).³³ As a consequence of the concentration and uneven distribution of non-food natural resources across the country, this results in worsening regional differentiation and income disparities. Furthermore, since resource-rich provinces typically have more opportunities to increase the variety and levels of local taxes and levies, this regional disparity is further amplified (Bhasin and Venkataramany, 2008: 7 and 9). It should be noted, however, that such regional differentiation is a common outcome of bottom-up processes.

A further observed consequence, which is likely unexpected considering the goals of fiscal decentralisation, is the increase in moral hazard and opportunistic behaviour. The increased revenue assignments and the transfer of expenditure responsibilities to the local governments, coupled with the introduction of the special and general allocation funds (DAK, DAU), has

resulted in weaker spending discipline and increased moral hazard, especially in natural resource-rich regions.³⁴

Finally, the goals and impacts of decentralisation are usually related to improvements in economic and cost efficiency. These goals and impacts seem to be almost immediate when considering that local governments know more about citizen needs (i.e., preferences and priorities as well as their willingness to pay certain types of taxes) and are more accountable than central governments. However, these kinds of improvements are not in most cases the outputs of representative local government. An explanation for the inadequate level of decentralisation in developing countries appears related to the concepts reviewed in the previous sections, including structural changes, complex adaptive systems emergent properties and so on. Emergent properties in particular cannot be deduced from properties of parts at lower levels (and/or based on the interaction rules or laws), and so their eventual identification is *a posteriori* exercise. Yet, in the ongoing process of Indonesia's decentralisation, some surprising outcome can be recognised. For example, there are cases of diversification, reproduction as well as ambiguous results such as HDI misperception, de-industrialisation, rampant corruption and so on. These examples and a few others are depicted below.³⁵

- Misperception of public service quality: among the impacts of decentralisation in Indonesia, there has been an improvement in public service delivery. However, the general social perception of public service quality is negative. HDI indicators have improved over the post-decentralisation years, as showed in Appendix 4. On the one hand, there is in fact an expansion of the country-wide network of infrastructure, including roads and health and education facilities, as well as positive 2003 and 2005 World Bank reports, including various surveys. But on the other hand, a number of national newspapers continue to report on the

deterioration in the country's infrastructure and on the fact that local governments appear to be paying too little attention to improving the quality and efficiency of public service delivery.³⁶

- Rivalry among governmental bodies: the amendment process of both Law 22/1999 and Law 25/1999 revealed old, continuing problems at the central level, a lack of coordination among ministries and, in particular, rivalry between the Ministry of Home Affairs (MOHA) and Ministry of Finance (MOF) (Brodjonegoro, 2005a: 5).

- De-industrialisation: along with decentralisation, there has a declining importance of the manufacturing sector (Brodjonegoro, 2005a: 8 and 20). Decentralisation may play a role in the development of locally-oriented economic policies and projects; however, all over Indonesia, it is possible to observe significant rates of de-industrialisation (see Appendix 5). In some regions, the negative or near-zero growth rates of the manufacturing sector between 1999 and 2002 were primarily due to the Asian economic crisis. But when looking at the more recent years between 2004 and 2007, it is possible to observe growth rates on average lower than during the pre-crisis period.

- Regional underperformance: it is rather difficult to separate the effects of the overall economic crisis from those induced by decentralisation on regional economic growth in Indonesia. Comparing the period of economic crisis with the post-2001 to 2002 recovery phase, there is clear evidence of improved growth in GRDP levels both at regional levels and nation-wide (Appendix 6). However, since then, economic growth rates throughout the

decentralisation phase have been lower than during the Soeharto era of centrally-controlled growth.

- Rampant corruption and flourishing of religiously-oriented parties: in Indonesia, the less corrupt districts have been generally more sympathetic to vote for more secular parties, as they do not perceive corruption as an issue. Since the introduction of decentralisation and local elections, however, voters in originally less corrupt districts were surprised by an increase in corruption relative to other areas and have thus changed their political views and started voting in Islamic parties (Kuncoro 2006: 36-7). Indeed, according to a survey in 2005, the devout Muslims are less willing to pay bribes, and the two major Indonesian sects of Muslims are more inclined to vote for Islamic parties (Henderson and Kuncoro, 2006).
- Negative investment climate: while the economic and political crises have contributed to the deterioration of the regional and local business climate, one would expect democratisation and decentralisation to help alleviate some of the tensions among central, regional and local governments. Yet interviews with international and national companies and investors have indicated that decentralisation increases the uncertainty, complexity and costs of doing business at regional and local levels. This is due to the increasing investment and production costs created through the proliferation of additional local charges and levies that have distorting effects on the investment and business decisions of companies (Brodjonegoro 2004: 130-6). For example, mining companies are extremely concerned about the unclear division of responsibility between central and local governments as well as the lack of

experience, professionalism and thus increased investments risks in the mining sector (Bhasin and Venkataramany, 2008: 7 and 9).

Each of these emergent properties is the result of a basic structural change process (i.e., assembly versus disassembly and top-down versus bottom-up). Moreover, the abovementioned emergent properties involve self-organisation and natural adaptation processes, as represented by Indonesia's ability to change and learn. It is also important to highlight that emergent structures are not only an outcome but may also influence future events, making possible the evolution of qualitatively different kind of systems (Eve, *et al.*, 1997: 33). Accordingly, the structural changes described (and hence their associated emergent properties) that have resulted from Indonesia's reforms are, while often not deducible in advance, merely part of the complex adaptive nature of the system itself. Indonesia is still in a transition period from a rather stable period (i.e., Soeharto's administration) to a new and still unknown period (i.e., the expected democratised and decentralised Indonesia).

4. Reinterpreting Indonesia's decentralisation process

This section summarises some of the dimensions along which structural change processes have taken place in the decentralisation and democratisation of Indonesia, including some of the initial conditions of these processes. Complex systems can be characterised in several different ways, and at superficial level, they are evidently hard to design and understand. These conceptual and practical problems often stem from the multiple interactions that occur among many different components. As such, this section (and particularly Figure 6) does not aim to represent or model

Indonesia's decentralisation; it merely tries to show some of the main dimensions along which structural change processes took and are taking place.

As initiated by the top-down introduction of new laws (namely, Laws 22/1999 and 25/1999), the decentralisation process has involved the stipulation of changes in the country's administrative and fiscal structure. This resulted in bottom-up responses as well as multiple subsequent changes (i.e., top-down and bottom-up stimuli and responses), which have taken place through adaptive processes across the country's institutions (see Sections 3 and 4). The most relevant set of initial political and economic factors that facilitated Indonesia's decentralisation reform were the Asian financial crisis, regional separatist movements (especially from resource-rich and ethnically distinct regions) and reforms prescribed by international organisations. These main factors make up the environment of the system;³⁷ see Figure 6.

[Figure 6 about here]

5. Conclusions

As stated by Aswicahyono, *et al.* (2008: 366), crises in developing world are frequent but have unpredictable consequences. But this is not only true in crisis times and in developing countries. It is valid for any kind of change and in all social systems. These systems are continually changing, and since they are complex by nature, most of the changes have unpredictable outcomes. It is therefore difficult to develop an analytical framework that can foresee outcomes and recovery trajectories. For this reason, this paper uses systems theory to examine a case study, namely, Indonesia's decentralisation experience.

Indonesia is the fourth largest country in the world, and it has been called the largest unknown country (Pramodhawardani and Rieffel, 2007: 1). Its decentralisation process, which started after Soeharto's downfall in 1998, has been analysed by many scholars, and it is still a topic of great interest. This paper presents the well-known story of the Indonesia's remarkable transition to a democratic society and decentralised country. But using systems theory, the story is presented in a new way, and this version of the story allows us to identify types of structural changes with respect to socio-economic processes and real-world events.

The two states of the system (centralised Indonesia and decentralised Indonesia) imply a transition period. The initial and current instability of the system as is observed in the case of Indonesia is an inherent part of the process of change in any social system. This instability allows the country to re-organise itself from its previous state (centralised structure) and respond to the changes imposed by decentralisation laws. Transformations are part of system adaptation and evolution; moreover, transformation may range from gradual to revolutionary.

This paper is a useful intellectual exercise to understand the various types of structural change. It is also a practical exercise in which general ideas are applied to the Indonesian case. This case study clearly reveals the intrinsic complexity of any social, political or economic change — including the unfolding of regional autonomy and fiscal decentralisation, and the role of emergent properties. It reveals that a social system's new properties cannot be anticipated and that the goals of stability and order are increasingly difficult to maintain. By applying these concepts to the Indonesian case, it is also possible to understand some of the processes that maintain Indonesia's the *status-quo*.

The title of this paper, namely, “Reinterpreting socio-economic processes: a systems view of decentralisation in Indonesia” aims to call the attention of the reader to the fact that the characteristic disorder of transition periods are often overlooked and interpreted as programs failures or ineffective policies. It is true that many developing countries are trapped by inefficient governance (and Indonesia is not the exception), but looking at the problems in the traditional ways without understand their essence cannot lead to effective solutions. A systems view offers an awareness of the nature of a given social system. This view also provides insights that permit a better understanding of the situation and can promote organisation renewal through better policy design.

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Figures and Tables

Figure 1
Environment, System, Subsystem and Components
(Source: Dallenbach 2003, p. 29)

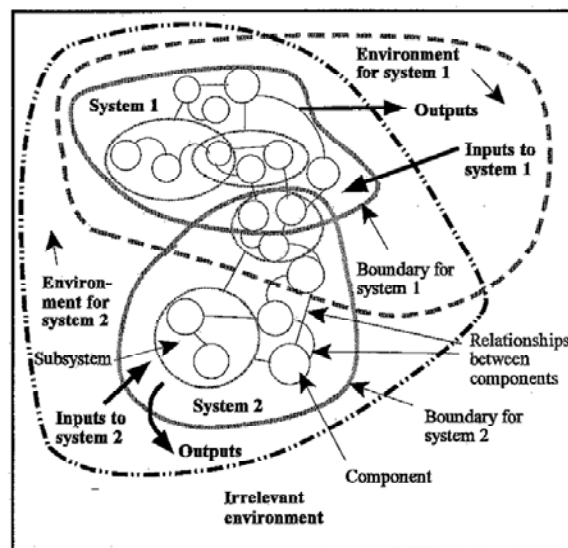


Figure 2
Assembly Process

(Source: own representation based on Dallenbach 2003)

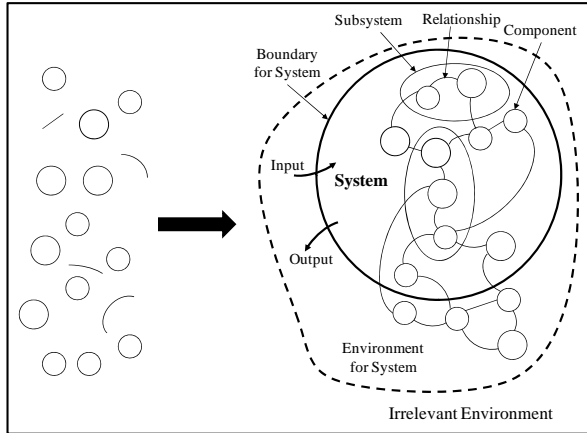


Figure 3
Disassembly Process

(Source: own representation based on Dallenbach 2003)

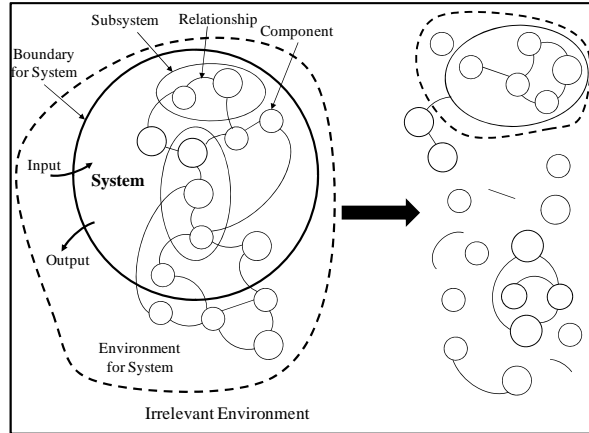


Figure 4
Top-Down and Bottom-Up Processes
 (Source: own representation)

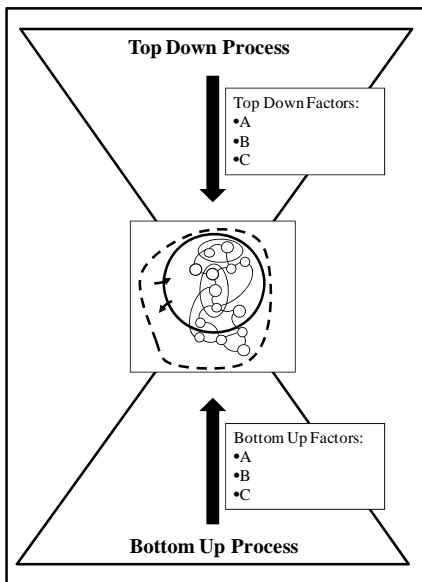


Figure 5
Possible responses to balance the stimuli
 (source: Own representation)

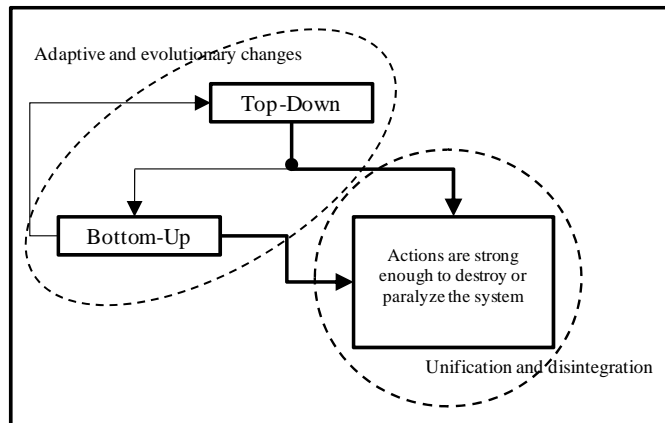
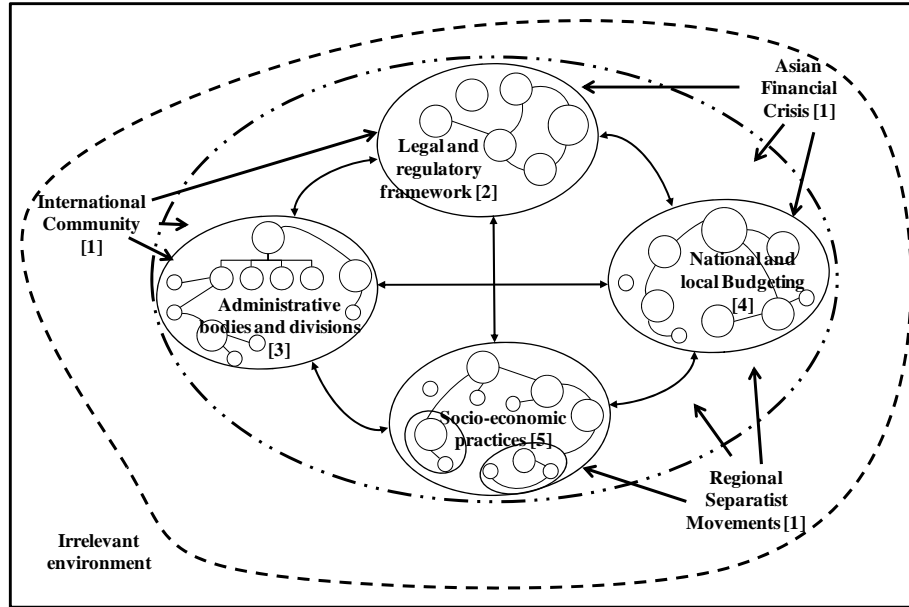


Figure 6
Indonesia's decentralisation system and subsystems
 (Source: own representation)



[1] The system environment is comprised of the drastic decentralisation process that started during the Asian financial crisis period through (i) grassroots pressure from the domestic citizenry in several resource-rich and ethnically distinct regions following Soeharto's downfall and coupled with (ii) political and economic reforms prescribed by multilateral institutions. Both the Asian financial crisis and international community prescriptions were exogenous drivers of decentralisation and democratisation processes. Alternatively, regional separatist movements were endogenous.

[2] Top-down legal and regulatory reforms comprise these decentralisation and democratisation processes. These were set off by a series of constitutional and legislative initiatives.

[3] The central bureaucracy is disassembled into regional administrative units. The top-down stimuli of changes in the legal and regulatory framework induced bottom-up responses, resulting in the disassembly and diversification of the system into numerous autonomous and differentiated local governments. The proliferation of local governments still continues today. Moreover, central administrative bodies, ministries, organisations and functions were partially dismantled, rearranged, moved and functionally delegated to local governments.

[4] Disassembly and diversification of local government budgets and successive adaptive changes increased local budgeting autonomy. The devolution of power has increased local autonomy, especially in resource-rich districts and municipalities. While this offered a higher degree of responsibility and flexibility to the local governments, it also induced unanticipated phenomena such as inefficiencies, moral hazard and opportunism.

[5] Adaptive changes in social practices due to disassembly and assembly were induced by top-down and bottom-up processes. In line with administrative and fiscal decentralisation, the historically centralised business relationships shifted towards local district and municipal governments. In particular, local governments reproduced central government practices, thereby changing the hierarchy of the system. Business and industry-related incentives, risks and practices have shifted the focus of interest to lower government hierarchies, that is, local governments. A well-known example of changes within the socio-economic dimension is the adoption of the previously centralised informal rules and networks in the context of local socio-economic practices, which have resulted in unpredicted consequences at the macro-level, such as de-industrialization, rise of poverty, pollution, etc.

Table 1
Examples of Combinations of Structural Change Processes

Processes		Examples
STIMULI	RESPONSES*	
Top-Down	Assembly	<ul style="list-style-type: none"> • Changes in laws, regulations, norms to support international economic or political agreements (e.g., trade blocs and international organisations) • Advertised international fashion collections that homogenise consumer tastes [INTEGRATION] • Socialist and dictator governments, including their redistributive actions, to homogenise parts in terms of economic wealth (e.g., the social and economic system that occurred in the Soviet Union and Cuba) [UNIFICATION]
	Disassembly	<ul style="list-style-type: none"> • Counterrevolutions such as the insurgency of the peasants in Vendée (1793) during the French Revolution and attempts of the White Army during the Russian Revolution (1917-1921) • Policy-induced market competition [DIVERSIFICATION] • Central government policy that induces administrative and fiscal decentralisation [DIVERSIFICATION]
Bottom-Up	Assembly	<ul style="list-style-type: none"> • Nations that agree to form an economic bloc • Social, religious or legal union of individuals in which parts become more united and similar [INTEGRATION] • Political parties that join their actions to reach a common goal [INTEGRATION]
	Disassembly	<ul style="list-style-type: none"> • Dissolution of marriage or any other kind of union [DIVERSIFICATION] • The dissolution of a commercial company by shareholder agreements [DISINTEGRATION] • Bottom-up responses to fundamentally changed political power (e.g., independence wars to colonial power, civil wars and so on) [DISINTEGRATION] • Revolutions against autocratic governments such as monarchies (e.g., Russia's Tsar) and dictatorships (e.g., Indonesia's Soeharto, Cuba's Batista) [DISINTEGRATION] • Differentiated individualisation by following fashion or styles [DIVERSIFICATION]

(*) The cases that imply particular types of assembly versus disassembly and top-down versus bottom-up combinations are explicitly indicated by brackets.

Table 2
Profile of Three Tiers of Local Government
 (Source: Central Statistics Agency, Trends of Socio-economic Indicators, 2008)

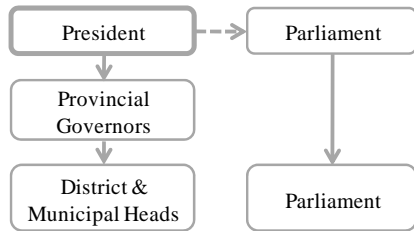
Year	Provinces	Districts (Regencies)	Municipalities	Districts & Municipalities
1998	26	249	65	314
1999	27	268	73	341
2000	30	268	73	341
2001	31	268	85	353
2002	32	302	89	391
2003	32	349	91	440
2004	33	349	91	440
2005	33	349	91	440
2006	33	349	91	440
2007	33	370	95	465

Appendices

Appendix 1:

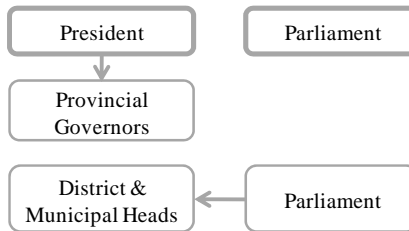
Overview of Indonesia's decentralization timeline

I. Pre-1998 Soeharto's era



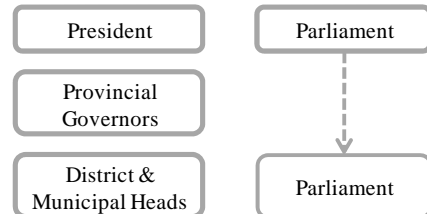
- Autocratic president, passive legislative, appointed local executives
- Approx. 310 districts & municipalities (D&M)

II. Post-1999 Decentralization laws



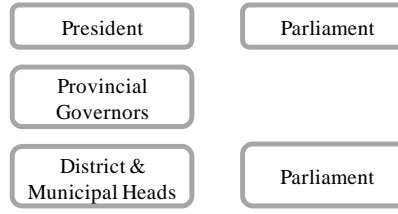
- Party election for central & local legislates
- Winning party appoints (its leader) as President
- Local legislates appoint local execs (440 D&M by 2003)

III. Post-2004 Direct local elections



- Directly elected president and governors
- Party election for central & local legislates
- Directly elected local execs (465 D&M by 2007)

IV. Post-2009 Direct parliamentary elections



- Directly elected president and governors
- Directly elected central & local legislates
- Directly elected local execs (498 D&M by 2008)

Appendix 2a:
GDP by relevant sectors (figures in Rupiah Million)
(Source: Central Statistics Agency)

Industrial Origin	2004	2005	2006	2007	% GDP
1. Agriculture, Livestock, Forestry and Fishery	329,125	364,169	433,223	547,236	14%
a. Forestry	20,290	22,562	30,066	35,734	*)
b. Fishery	53,011	59,639	74,335	96,822	*)
2. Mining and Quarrying	205,252	309,014	366,505	440,826	11%
a. Oil & Gas Mining	118,485	177,606	200,082	234,158	*)
b. Non-Oil and Gas Mining	65,122	104,599	130,701	160,459	*)
c. Quarrying	21,645	26,809	35,723	46,210	
3. Manufacturing Industry	644,343	760,361	919,533	1,068,806	27%
a. Oil and Gas Manufacturing Industry	94,263	138,441	172,095	182,296	5%
1). Petroleum Refinery	59,062	89,630	117,952	122,097	
2). Liquefied Natural Gas (LNG)	35,201	48,811	54,143	60,200	
b. Non-Oil & Gas Manufacturing Industry	550,079	621,920	747,438	886,510	
Gross Domestic Product	2,295,826	2,774,281	3,339,480	3,957,404	

*) included in the natural resource revenue sharing scheme)

Appendix 2b:
Exports by relevant sectors
(Source: Central Statistics Agency)

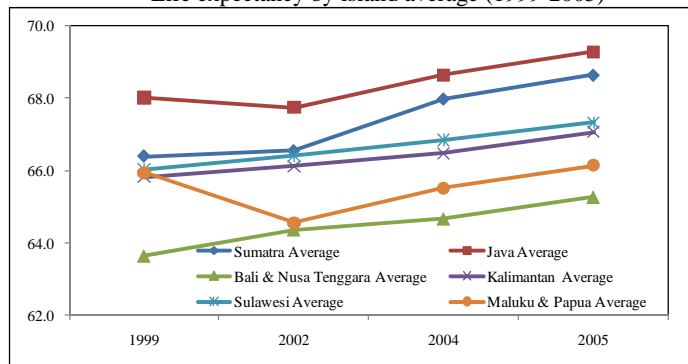
Industrial Origin	2003	2004	2005	2006	% of total (2006)
Crude oil	5,621	6,241	8,146	8,169	
Fuel products	1,554	1,654	1,932	2,844	
Gas	6,477	7,750	9,154	10,197	
Oil & Gas	13,652	15,645	19,232	21,210	21%
Coal	1,980	2,749	4,354	6,086	
Copper	1,855	1,802	3,311	4,646	
Palm Oil	2,455	3,442	3,756	4,818	
Plywood	1,663	1,577	1,375	1,507	
Other Agro	5,799	6,064	7,008	8,020	
Mining & Agro	13,752	15,634	19,804	25,077	25%
Manufacturing & Other	33,654	40,306	46,624	54,512	
Total	61,058	71,585	85,660	100,799	

Appendix 3:
Key provinces' share of oil, gas, mining sectors (figures in Rupiah Million)
(Source: Central Statistics Agency)

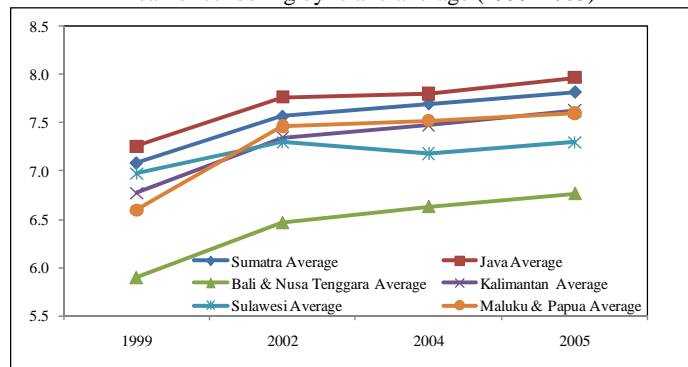
Key Provinces' Mining GRDP	2000	% total	2006	% total
East Kalimantan	28,678,136.0	19%	82,700,980.6	27%
Riau	44,739,939.0	30%	70,427,525.4	23%
Papua	12,549,969.2	8%	32,245,723.3	11%
South Sumatera	13,011,087.0	9%	25,060,662.0	8%
Nanggroe Aceh Darussalam	12,225,498.9	8%	19,292,949.0	6%
West Java	9,077,666.9	6%	12,875,010.4	4%
Central Java	1,100,330.8	1%	2,869,482.0	1%
East Java	4,184,214.4	3%	9,711,418.6	3%
Total Indonesia	149,140,583.8	100%	306,373,629.0	100%

Appendix 5:
Indonesia' HDI indicators *

Life expectancy by island average (1999-2005)

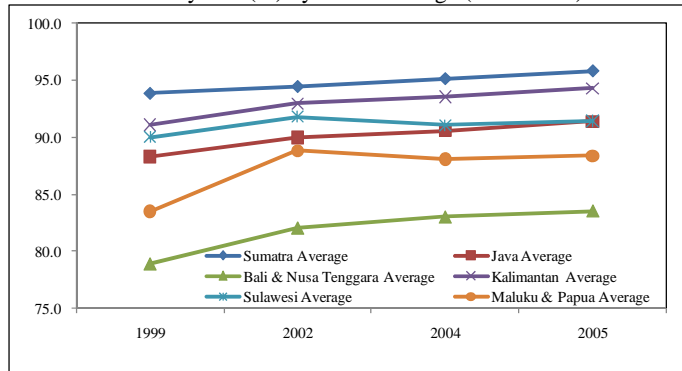


Mean of schooling by island average (1999-2005)

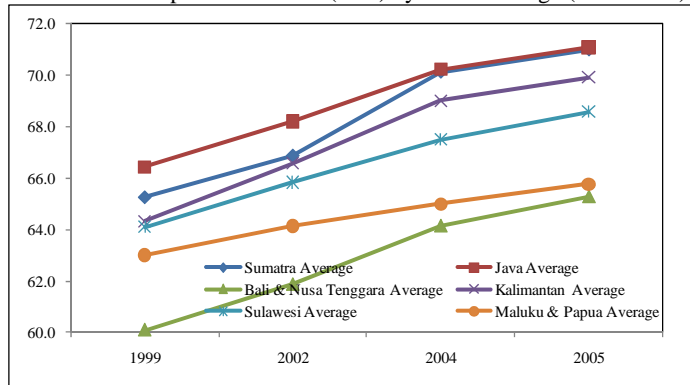


* The averages per island considered is not population weighted.

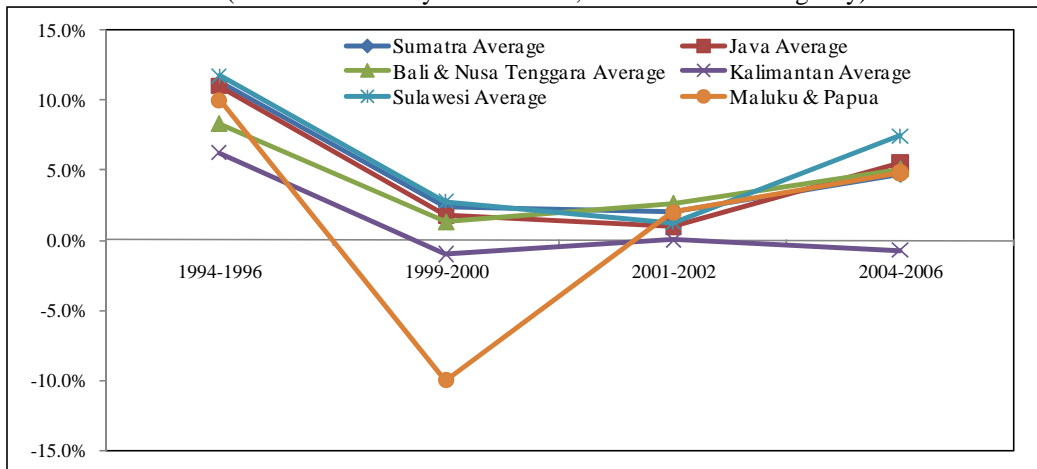
Literacy rate (%) by island average (1999-2005)



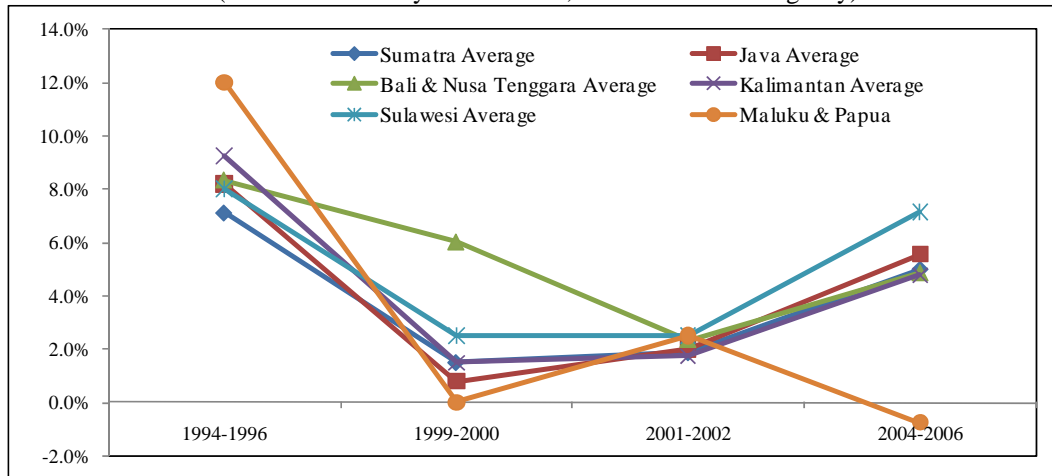
Human Development Indicator (HDI) by island average (1999-2005)



Appendix 6:
Regional manufacturing growth
(Source: University of Indonesia, Central Statistics Agency)



Appendix 7:
Regional GRDP growth
(Source: University of Indonesia, Central Statistics Agency)



End Notes

¹ Complex systems exhibit other features, such as openness, non-linear relationships and non-distinguishable boundaries. Besides, there are different types of complex systems, such as chaotic systems, adaptive systems, and organised and disorganised complex systems.

² These processes may involve interactions that are endogenous and/or exogenous, self-reinforcing and/or self-extinguishing, and adaptive and/or evolutionary as well as nonlinear dynamics and a number of other types of processes. This paper is limited to a few of these characteristics.

³ Decentralisation is defined as the process of distributing, dispersing and/or delegating a country's governmental roles, responsibilities and decision-making from its central government to individual provincial and regional governments. This process captures all of the aforesaid processes and illustrates the inherent complexity of social systems.

⁴ Examples of systems include a cell, the brain, a company, a wheel, an engine, the economy, a family, a computer, an atom, the human body, an industry, a football team, a government and a nation. In many cases, a part of a system can be a system itself (i.e. subsystem).

⁵ Naturally, these concepts are more complicated and may even involve philosophical issues. For the purposes of this paper, these simple and brief definitions are adequate.

⁶ These include force-transmitting properties, such as elasticity and gravity between the components of the system (bricks) and the earth (environment).

⁷ Other examples include the emergence of fashions, learning effects (e.g., improvements as a result of 'learning-by-doing' or relationships between growth of output and growth of productivity) and the use of a certain method or system of payment (e.g., an increase in the use of a credit card users may induce its wider acceptance). Arthur (1988) categorised types of self-reinforcing mechanisms: (i) interaction effects, (ii) network effects, (iii) scale effects, and (iv) learning effects. Self-reinforcing interactions may also be associated with network-effects common in many technology-related economic processes. Regarding self-extinguishing processes, one example is the market mechanism, that is, the demand and supply interaction, which allows for the stability of a system through the regulation of prices (or interest rates or wages).

⁸ Programming methodology or style (i.e., procedural languages and object-oriented languages) are also good examples of these strategies.

⁹ This idea is almost intuitive when one thinks of the persistence of either top-down or bottom-up forces. In the case of societies, the former case will lead to a dictatorship and the latter one to anarchy. Persistent forces often lead to bottom-up or top-down responses that will result in successive structural changes.

¹⁰ In fact, families may also involve bottom-up disintegration processes through divorces. In particular, marriage and divorce are both agreements between parts (i.e., bottom-up processes) to establish or break interpersonal relationships. Another example is systems with fractal geometry, such as clouds, the shape of the coast (coastline), the trees or a galaxy. These kinds of systems have geometrical shapes formed by similar parts that reproduce the shape of the system in a smaller scale.

¹¹ Education is an example that implies a trade-off between the aforementioned processes. The act of imparting a particular knowledge or skill to an individual is a top-down process, but the willingness to learn and the social benefits of educated

individuals involve bottom-up processes. Education is a progressive learning process in which there is a continuous interaction between knowledge (i.e., top-down transmission) and performance (i.e., bottom-up implementation).

¹² Adaptive adjustments are the result of natural selection, or inheritable changes, which are reflected in changes in an organism's physiology, genetics and so on. Indeed, the main biological adaptations are chemical and genetic. A typical example of adaptation is migration, which involves all types of populations, included human, defence and assault (as in the case of wars) as well as also adjustments to the temperature, which involves further adjustments in a number of parts of the body.

¹³ This paper does not consider these concepts under any particular viewpoint or perspective, such as neo-Darwinian view of evolution.

¹⁴ The notion of self-organisation is closely related with the notion of complex adaptive systems. Self-organisation can lead to fundamental structural changes in which change is the orderly behaviour that emerges from the spontaneous interaction among parts following simple rules. For more on this topic, see Kauffman (1993).

¹⁵ This is not a new idea, as it dates at least from the time of Aristotle. Yet many other philosophers and scholars in more recent times have analysed emergence, since it has been a persistent matter in social thought. See, for example, Mead (1932) or Morin (1977).

¹⁶ The same logic applies to a disassembly process.

¹⁷ This is evident if one thinks of fiscal decentralisation and its effects on political stability, administrative and fiscal institutions, economic growth, business environment and so on.

¹⁸ The period before Indonesia's democratisation in 1998 is beyond the scope of this paper. For a summary of this period and the role of intergovernmental fiscal relations, see Ford and Brodjonegoro (2004).

¹⁹ The power of Soeharto and his dominant Golkar party was further solidified through their close business and political interactions with a number of domestic economic elites that comprised large family-owned business groups.

²⁰ A detailed account of budgeting in decentralised Indonesia is available in Brodjonegoro (2005b).

²¹ Indeed, during local elections, the Golkar party kept winning, while provincial governors were often retired generals loyal to Soeharto.

²² Local governments only received a very small proportion of their own sources of revenues.

²³ Separatist pressures not only came from resource-rich (i.e., more economically-independent) regions; these pressures were also more prevalent in socio-politically and/or ethnically more diverse regions, such as Aceh and Papua.

²⁴ The revision of these laws took place during the Megawati presidency in 2004.

²⁵ This includes the direct election of the president, provincial governors and local executives (i.e., district and municipal heads) starting in 2004 as well as the direct election of central and local legislative members starting in 2009.

²⁶ For a detailed review of Law 22/1999, see Suwondo (2002).

²⁷ The local government at all levels was subordinated to the central government in all important respects. Although the legislature of the provinces, districts and municipalities were popularly elected and had the right to nominate candidates for the governor, regent and mayor, it was the president who appointed the governors. Meanwhile, the Minister of Home Affairs appointed the regents and mayors. These appointed heads of the executive branch of local governments were then accountable to the central government and acted as agents of this higher-level government. Under this structure, the central government made all important policy decisions, while the role of provincial and local governments was to implement the decisions of the central government with very little input from the people in the provinces, districts and municipalities (Asanuma and Brodjonegoro, 2003: 112).

²⁸ It is remarkable that the DAU allocation is based on the differences between estimated expenditure requirements and each local government's fiscal capacity for revenue generation. Despite the new intergovernmental fiscal system and the increasing importance of bottom-up autonomy (i.e., local and regional governments are free to spend part of their funding and budget entitlements), the overall budgetary arrangement is still a partially top-down process.

²⁹ For a detailed account of changes in the distribution of natural resource revenues (i.e., revenue allocations from the exploitation of natural resources and the reorganisation of the transfer system), see Ford and Brodjonegoro (2003: 26).

³⁰ A change in political and administrative divisions (especially in terms of provinces) of a country usually implies long juridical processes, but this was not the case in Indonesia. Nevertheless, the proliferation of provinces has diminished over time.

³¹ In the context of this analysis, more parts do not mean more properties or a larger system. The possibility of formation or amalgamation of parts (including provinces, districts and so on) is only an emergent property of the new system. It is indeed important to highlight that a system is different from the sum of its parts.

³² This excludes food crops, which are primarily targeted to domestic consumption and are not included in Law 25/1999.

³³ It is noteworthy that due to the decline in oil production but the rapid increase in coal and minerals production in recent years, the provinces of East Kalimantan and Papua have seen their contribution increase at the expense of the province of Riau.

³⁴ For example, local district and municipal heads are now incentivised to report lower local taxation revenues and higher budget requirements, including less useful projects such as amusement parks or even artificial 'paper' projects that may never be build, in order to achieve and maintain higher levels of fund allocation.

³⁵ Any change has a repercussion in the system, as is clear in social systems. Emergent properties can have either positive or negative repercussions in the system. In the case of Indonesia and particularly in the examples used here, these repercussions have had negative effects on the system. However, this does not mean that Indonesia's decentralisation reform cannot have positive effects on medium- and/or long-term economic and social performance.

³⁶ The central government is trying to change this perception by promoting the implementation of minimum service standards to incentivise nation-wide improvements in public services (Brodjonegoro, 2005a: 4).

³⁷ According to Wasson (2006: 36), “a system’s initial operating conditions consist of the physical and operational states of the system and its surrounding operating environment and the beginning of a system mission phase, operation or task.”