Using Event Structure Analysis to Analyze a Case of Firm Internationalization

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IMP Conference, Kedge Business School, Bordeaux, December 2014

Abstract

To improve our understanding the internationalization process we need theories and methods that deal directly with how and why things change over time, rather than atemporal variables based model based on cross-sectional studies and purely descriptive case histories. We argue that event based research methods in which event sequences are explained in terms of causal mechanisms are a way forward. We use a case history of firm internationalization to show how such research can be conducted.

Keywords: internationalization, process models, event structure analysis, mechanisms, processes

Introduction

Internationalization refers to the process by which a firm's involvement in international markets, changes and develops over time. Existing research tells us little about this process because, as (Paavilainen-Mäntymäki & Welch, 2013) observe: "[It is] a processual phenomena which traditionally has not been studied processually" (p 229). Most research is based on atemporal variance based models and cross-sectional studies. Case studies that provide historical accounts of firm internationalization deal more directly with time and process and have led to the development of various types of stage models of internationalization (Bilkey & Tesar, 1977; Cavusgil, 1980; Czinkota, 1982; Johanson & Wiedersheim-Paul, 1975a). To improve our theories of internationalization we need to go beyond context specific descriptive accounts (Pettigrew, Woodman, & Cameron, 2001).

We argue here that event structure analysis (ESA), a less well-known research method. The aim of ESA is to help develop process theories of organizational change, such as firm internationalization, that explain change in terms of temporal sequences of events that take place in a particular context and the causal or generative mechanisms that underlie how one event leads to another (Pettigrew 1997). Rather than 'causality being attributed to variables, social

actors move onto the stage of history as change agents of history' (Pettigrew et al., 2001; p.699). We argue that this is much closer to the lived history of managers and policy makers, who do not manage variables, they initiate and respond to events.

ESA involves identifying the temporal sequence of key events taking place over time in a case history and how they are connected through the operation of one or more causal mechanisms in a particular context. Next, the context specific events, mechanisms and contexts are conceptualized in terms of more abstract, context independent concepts. Finally, the fit between the results of ESA and existing theories is examined, theories are confirmed, adapted or replaced and further ESA projects are carried out in an abductive manner.

In this paper we describe what is meant by event based process theories and how they differ from the more common variables based theories, show how ESA analysis can be used to analyze a descriptive case history of firm internationalization; and how the results can be used inform theory development.

It should be noted that we are not arguing that event based theories replace variables theories. On the contrary, they are complementary and one can inform the other. They provide different types of perspectives, with event based theories seeking history based explanations and variables based theories seeking general covering law-like regularities.

In the next section we describe the nature of event based process theories and the nature and role of causal mechanisms. We then describe a case history of firm internationalization and analyze it using use ESA. We conclude by showing how our results can be used to inform the development of theories of internationalization.

Event Based Process Theories

Events may be defined as: " a distinguishable happening, one with some pattern or theme that sets it off from others" (Conkin & Stromberg, 1989; p.173). They are a type of critical incident (Flanagan, 1954; Gremler, 2004). Events are the primary drivers of history, which has been described as the eventful transformation of social structures (Padgett & Powell, 2012; Sewell, 2005). Events result from the operation of one or more causal mechanisms that are triggered by other events.

A ‘mechanism’ is a special kind of process, which explains how something came about (Bunge, 1997; Machamer, Darden, & Craver, 2000), including social, economic, physical, psychological, and technical processes (Elster, 1989). Mechanisms, ‘comprise entities, with their properties, and activities. Activities are the producers of change, entities are the things that engage in activities’ (Machamer et al., 2000; p.3).

To understand how the mechanisms operate and bring about the change requires identifying the entities that engage in the activities and the capacities or properties that give them the capacity to act at a “particular time, in a particular place, or occurrence to engage in activities” (Craver, 2001; footnote 4). Entities are broadly defined to include both animate (e.g. people, firms, organizations, animals) and inanimate (e.g. material things, texts, ideas, electrons) depending on the relevant context and level of analysis. Mechanisms do not refer merely to what happens: “It is not the penicillin that causes the pneumonia to disappear, but what the penicillin does” (Machamer et al., 2000; p.6). With regard to people and firms, not all actions are purposeful, they could happen by chance or be the result of tradition.

The classic Uppsala model of the internationalization (Johanson & Vahlne, 1977; Johanson & Vahlne, 2009) is one of the few examples of process models and it identifies some of the main types of causal mechanisms involved, feedback and learning processes. These take place in a particular environment as a result of a firm’s decisions (events) to commit resources to international markets (events) and their actions and interaction in those markets (events). They also identify two types of commitments based on the operation of two types of mechanisms, scale-increasing and uncertainty reducing, which depend on the level of risk involved.

The Uppsala model is obviously a major contribution but it does not tell us much about how mechanisms are triggered, operate and interact in a particular context and how they result in particular temporal sequences of events and patterns of internationalization. To do this we need to study patterns of internationalization over time in a more systematic manner to identify the key events and mechanisms involved and the way they are embedded in a particular context. Where context includes the social, political, economic and industry environment, history and the preferences, resources, skills and knowledge of the people and firms involved. The Uppsala model was developed based on case studies of firm internationalization (Johanson & Wiedersheim-Paul, 1975b) but these were not formally analyzed using methods like ESA, which we describe here. These are described and illustrated in the section.

ESA of Case Histories of Firm Internationalization.

The first question is where to begin a case history of a firm's internationalization. We argue that this should begin before the first moves into international markets to the founding of the firm and its development because internationalization is history dependent. The events taking place and the causal mechanisms operating over time shape the resources and characteristics of a firm and its personnel including their knowledge and perceptions of international markets and their attitudes to international markets. This will affect the kinds of international market opportunities they recognize and discover and the way they respond and develop them. This is clearly illustrated in case studies of how firms' discovered and developed their first international market opportunity (Chandra, Styles, & Wilkinson, 2009a; 2012). For example, personal and professional networks developed early on, prior knowledge and the resources a firm has acquired, including key personnel can have major effects on the kinds of opportunities firm can see and act on.

We use the previously reported Biovite case history (Chandra, Styles, & Wilkinson, 2009b) to show how ESA can be used to help develop event based process theories The following summary has been edited to exclude parts that are not relevant here.

The Biovite Case

The origins of Biovite Australia Pty Ltd can be traced back to a scientific discovery in New Zealand in 2001.While working on a research project, a scientist accidentally discovered a bio-active in the cell of microscopic water borne cyanobacteria … The Scientist formed a company to protect the intellectual property of the discovery

It was in 1999 that the discovery found a promising light, when the Scientist met Mr Peter Johnston a veteran entrepreneur and business consultant for 30 odd years, who later took the discovery to the next stage. As Mr Johnston described it, the Scientist "used to sit next to him" in board meetings as they belong to the fellows or board of directors of a secondary school in Christchurch, New Zealand. In the words of Mr Johnston, "I didn't know him at that time. I hadn't met him before. It wasn't fostered through friendship or anything like that. It was arms-length".

It followed, not long afterwards, with a "complete surprise" when the Scientist came to see Mr Johnston who at the time was a Director in PricewaterhouseCoopers NZ, with the idea of setting up a company in New Zealand to commercialize the discovery. Until the late 90s, biotechnology industry was still inexistent in New Zealand. Venture capital industry and seed capital was scarce. Yet government assistance was practically unavailable. …

Peter Johnston, a New Zealander, and his family had a long history of entrepreneurship. … An accounting graduate of Massey University, Mr Johnston started his first career in 1961 as an auditor in Price Waterhouse Melbourne. For the next three decades, he accumulated a long list of professional experience in the manufacturing sector in New Zealand and Australia as well as in his own ventures. … During his career, he always had one to two other ventures: a building company and an export agency. "It was just an entrepreneurial thing the whole time…when you like that you know you just cant help it you do it…so I created networks which is very important", Mr Johnston recalled.

In 2000, Mr Johnston moved to Queensland to head the business services department of a Chartered Accountant firm in Bundall, one of the business centres in the area. When he came to live in Queensland, Mr Johnston became aware of

the Beattie's Economic Plan with the development of Queensland being based upon the biotechnology industry. Investments have been poured into research facilities and the federal government as well were just in the process of d eloping an infrastructure to foster biotechnology in Australia. ... Queensland has the highest number of botanicals in Australia; while Australia has among the largest number of botanicals in the world. "It rang a bell about the discovery I was aware of in New Zealand", remarked Mr Johnston. He then went back to New Zealand and negotiated the intellectual property with the NZ Scientist with the idea of commercializing it in Queensland. ....

Following a successful negotiation, Mr Johnston obtained a Letter of Undertaking to sell the IP within 12 months. The seventh day of June 2001 was the historical day. Biovite Australia Pty Ltd was officially formed. ... Mr Johnston was the main shareholder. The new venture formation process was made easier as Mr Johnston, who at the time was a Director at the CA firm, was allowed to set the company up as a "fee paying client". He served the two constituents from June 2001 until September 2002, when Biovite started its operations (12). Looking back, Mr Johnston recalled how hard it was for him to "start something from scratch" in an industry called "new ball game" which he has no knowledge, experience, and connection with. In a sentimental tone, Mr Johnston recalled his experience in establishing Biovite: "I was completely naïve. If I had understood the industry, I possibly wouldn't have done it. It's terribly difficult and the learning curve was very steep for me. I guess if I hadn't come across here to Australia this probably would never have had happened".

The quest continued as Biovite needed cash flow to support its "proof of concept" phase before the discovery was ready for commercialization. Proof of concept is a standard process in the biotechnology industry where early discoveries go into the testing stage, both in-vitro (in the laboratory "tube" tests) and in-vivo (in human and animal body).

Not long after Biovite's inception, Mr Johnston found a South African venture capital firm who was willing to invest. The head of the VC was in the Trade Tower in New York on his way to Australia. The seed capital went from South African to a merchant bank in New York and was ready to be transferred to Biovite. Unfortunately it was the Day the World Changed, with the September 11 Attack (2001). The attack caused a major exodus of seed capital to their country origin. Biovite lost the VC.

In August 2002, Biovite found an angel investor, a very successful businessman from the State of Victoria, who injected seed equity capital, that amounted to AUD $650,000. This was later followed by the second stage of investment of AUD $1,350,000. Within the month, Mr Johnston was able to pay the IP to the NZ Scientist. The investment has turned Mr Johnston into a minority shareholder; however, he still retained the executive power as the General Manager. Biovite officially opened its door for business in September 2002 and, since October 2002, has been engaged in the proof of concept phase. The company established a laboratory at its premises on the Gold Coast, Queensland in 2002 .

The company later attracted other sources of financing. In November 2002, it received the ISUS (Innovation Start-Up Scheme) Grant, amounted to AUD $85,000, from the Queensland State Government for R&D and commercialization purposes. The business plan of Biovite was only written in December 2002 and subsequently presented to the aforementioned seed capitalist in April 2003. The next round of financing came from the R&D START Grant, amounted to AUD $190,384, from the Federal Government in December 2002, for R&D activities. In 2003, Biovite received R&D Tax Concession Grant, which allowed it to obtain 30% rebate applied to 125% of approved R&D expenditure. This was followed by EMDG (Export Market Development Grant) from the Australian Trade Commission in September 2003.

There are several things to note about this account. First is the scale of action, which is primarily at the individual level, although here the individual is the firm. Second, the history begins before internationalization starts, with a scientific discovery. The case focuses on earlier internationalization, the move from NZ to Australia and the international sourcing of finance. The first move into international markets comes at the end but emerges from earlier events, mechanisms and conditions. Third, the classification of occurrences (events), mechanisms and conditions can be done at various scales of analysis. Where an event begins and ends is often not clear and several sub events maybe aggregated into one overall event. For example the event *Biovite gains additional funding*, could be broken into separate events for each capital source obtained but this is irrelevant

for our analysis. Similarly causal mechanisms can be identified in a highly detailed way e.g. writing plans, sitting next to each other, presenting proposals or more macro in focus e.g. learning, moving, paying. Fourth, the case shows the complex web of events and mechanisms that are intertwined and play out over time in a concrete inner and external context, which together produce the temporal sequence of events taking place – the overall internationalization process.

The first stage is the identification of key occurrences (i.e. context specific events) and conditions, including historical events and conditions that occurred before the case begins. As Abbott (1990) points out events are concepts whereas what actually happens in a case are occurrences in a specific context. Each occurrence is a form of critical incident in the development of the firm and the critical incident technique (CIT) can be used to help identify occurrences and their effects based on a content analysis of a narrative (Chandra et al., 2009a). Once occurrences are identified we need to conceptualise them in terms of more general, abstract, theoretically based concepts that can be applied beyond the specifics of the narrative. Table 1 lists the key occurrences identified and the associated conceptualized event.

Table 1
Key Occurrences and Events in Biovite Case

Occurrence	Conceptualized Event
EV1 Scientific discovery in NZ	Discovery
EV2 Formation of firm by Scientist	Organization formation
EV3 Scientist meets Johnston	Interaction
EV4 Scientist visits Johnston	Interaction
EV5 Scientist plans to set up firm	Decision
EV6 Johnston moves to Queensland	Change of geographic location
EV7 Johnston goes back to NZ	Moving
EV8 Agreement reached about intellectual property	Agreements
EV9 Biovite Australia Established	Organization formation
EV10 Johnston finds venture capitalist in NY	Discoveries
EV11 9-11 events in NY	Environmental events
EV12 Biovite loses venture capitalist	Relationship Ending
EV13 Biovite finds new venture capitalist in Victoria	Discoveries
EV14 Johnston pays IP to NZ scientist and becomes minority shareholder	Transactions
EV15 Biovite starts business	Organization formation
EV16 Biovite sets up laboratory in Queensland	Organization formation
EV17 Biovite finds additional financing.	Discoveries
EV18 Biovite begins international marketing.	Action

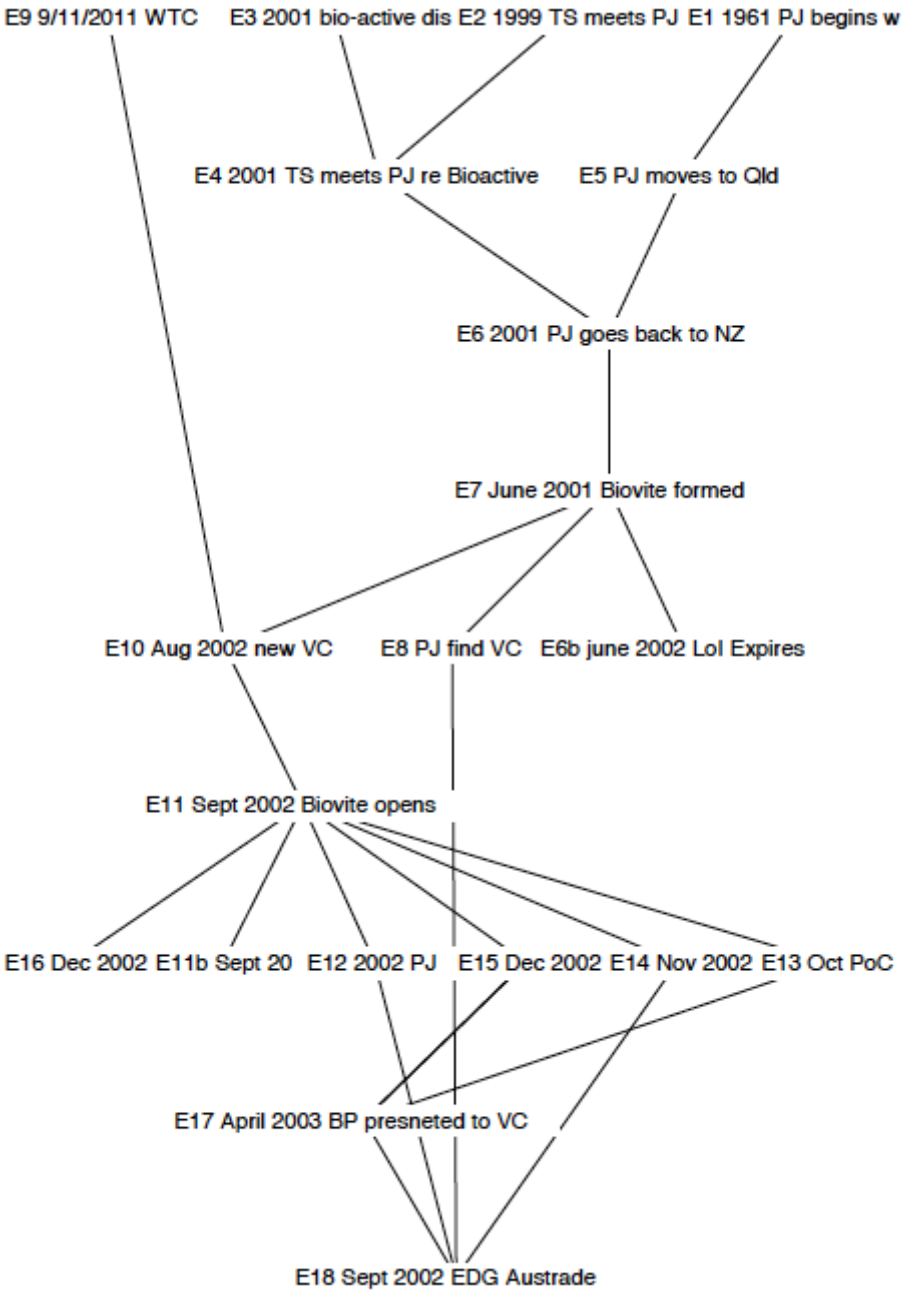
Once the key occurrences and conceptualised events have been identified we need to examine how they are connected. An occurrence in a narrative results from the impact of other occurrences and

the contextual conditions in which it occurs. The impact results from the operation of one or more causal mechanisms.

Event Structure Analysis (ESA) is used to identify the way different events are connected, i.e. the permissible prerequisites for each event (Gremler, 2004). A tool for guiding ESA is the ETHNO computer program developed at Indiana University (www.indiana.edu/~socpsy/ESA/). This method "infuses narrative with greater rigor and explicitness. It forces the researcher to follow a logical process in tracing connections between events, which are summarized in an event sequence map. Lines connecting events indicate the prerequisites for each event in terms of other events and contextual conditions. The lines indicate the operation of one of more causal mechanisms linking events. Figure 1 shows the event sequence map resulting from our ETHNO analysis of the focal case.

The next stage is to identify the mechanisms connecting events. For this we examine the prerequisites of particular events revealed by the ESA and continue to ask ourselves how and why this is so i.e. "repetitive questioning about how embodies the constant search for underlying mechanisms which drive the process" (Corsaro & Heise, 1990). For this we return to the narrative history as well as to theory. The verbs of the narrative give clues as to the specific mechanisms in operation which are then conceptualized in terms of more general types of mechanisms. This can be done at various levels of analysis because causal mechanisms, like events, form a nested system in which each type can be decomposed in terms of more detailed mechanisms reflecting physical, biological, psychological, social, economic, organizational and network processes. For example, the mechanism of interaction between people can be broken down into many sub-mechanisms including physical movement, cogitating, perceiving. communicating, reacting and adapting. This stage of the analysis is referred to as the process of colligation: "making up a basic theoretical 'story' of conceptual events and linking them together" (Abbott, 1990).

Figure 1 Biovite Case: ETHNO Event Structure Analysis



To identify the mechanism operating in the focal case the two authors independently coded the case narrative in terms of the mechanisms linking events. Differences between the codes were discussed until agreement was reached. At all stages of the analysis it is important to have multiple researchers involved as a form of triangulation in order to gauge how reliable the coding and interpretations are and to identify issues where further research, discussion and analysis is required. The resulting mechanisms as well as their conceptualization in terms of more general types are shown in Table 2.

Table 2 Causal Mechanisms Identified in the Biovite Case and their Conceptualization

Case Instances	*Conceptualized Category*
CM1 Scientist researching	Searching
CM2 Scientist Protecting IP	Safeguarding
CM3 meeting between Scientist and Johnston	Interacting
CM4 sitting next to Johnston	Moving
CM5 commercializing the discovery	Commercializing
CM6 creating a network	Networking
CM7 moving from NZ to Queensland	Moving
CM8 Johnston becoming aware of Qld government economic plan	Perceiving
CM9 It rang a bell about the discovery	Thinking
CM10 negotiating the IP agreement	Negotiating
CM11 forming new venture as fee-paying client	Founding
CM12 Johnston's learning curve	Learning
CM13 testing stage of the new discovery	Testing
CM14 searching for a VC	Searching
CM15 seed capital moving back to country of origin	Moving
CM18 searching for a VC	Searching
CM19 injecting seed capital into Biovite	Funding
CM20 paying the IP to NZ scientist	Transacting
CM21 attracting other sources of funding	Attracting
CM22 Writing business plan	Planning
CM23 Presenting business plan to VC	Planning
CM24 Applying for funds to begin international marketing activities	Requesting

Not all researchers may agree with our identification and conceptualization of events and mechanisms. In part this is because there is as yet no established classification system to use. This is a challenge for the future. In other disciplines this is not the case. In physics, chemistry and geology for example, the underlying mechanisms and types of events have been identified and conceptualized in terms of their manner of operation and outcomes depend on context and interactions with other mechanisms. But events such as a chemical reaction of elements producing other kinds of chemicals, or the operation of the fundamental forces of physics do depend on context, such as the level of heat and pressure and the operation of other forces than magnetism. In biology some mechanisms are still not fully understood and conceptualized e.g. mating behavior.

While we have described the methods involved in a logical order, theory building is not usually like that. We cycle backwards and forwards between the identification and interpretation of actual events and mechanisms in context and theory. The methods involved are qualitative and the

interpretation of the researchers matter. This is why we must be careful to triangulate data and the interpretation of the events taking place, the relevant contextual conditions and the mechanisms involved. As we note this can be done at various scales of analysis, from the intra-personal detailed psychological and physical processes involved to the macro level of firms, relations and networks as actors.

Discussion and Conclusions

The identified occurrences and conceptualized events and how they are connected by the operation of various types of mechanism provide the basis for theory development and adaptation.

How well does the ESA results fit with the Uppsala model? It is a very general model and the events and mechanisms identified in the case and their connections can be interpreted in terms of it. The events are included as various types of changes in the states of the focal firm and the mechanisms are included as aspects of the feedback and learning processes taking place over time. But not all events and mechanisms can be so classified. Some key events take place in the environment and in the states of other firms, people and organizations connected to the focal firm. A notable example is the 9/11 event. These types of events are not explicitly included in the Uppsala model. There are also contextual conditions that matter which are not events of mechanisms but are the residues of the operation of prior events and mechanisms. Examples are the formal training and experience of the main people, the trade policy environment in Queensland and the more general legal, educational and market environments.

Our results also help to refine and develop the Uppsala model. In particular we can unpack the model in terms a more detailed cyclical process of opportunity discovery (event), searching, learning and acting (mechanisms), leading to opportunity development (event), which in turn produces further searching, acting and learning as well as opportunity exploitation. Decisions to exploit an opportunity (event) leads to acting and commitment of time and resources (mechanisms) resulting in interactions with others (events) and outcomes (events) that have various types of feedback effects (mechanisms). Firms learning about other opportunities or refine existing and commitments to exploiting them. The case also indicates the relevance of networks of interactions among the people and firms involved. Through such interactions people and firms learn about opportunities and problems and access resources and skills. A firm's internationalization does not take place in isolation but as a part of complex adaptive system of interconnected interacting actors

who are engaged in their own internationalization processes.

Of course, there are obviously limits as to what we can learn based on the evidence from one case. But the case does provide existence proof for the relevance of different types of events and the operation of various types mechanisms. How frequently they occur and operate in different situations and how important the role they play is cannot be determined from one case. But empirical generalizations of this type are not the issue here. Our purpose is to facilitate the development of process theories. Additional event sequence analyses are required of firm internationalization in similar and different conditions and contexts in order to determine if additional types of events and mechanisms are relevant and should be included in our process theories.

What are the implications for research and practice of the methods described? A focus on process suggests a need to look at unfolding time as a moving picture that situates particular organizational dynamics within broader contexts and to examine their unfolding in relation to one another and how these interdependencies affect each of them.

For theory building ESA provides the foundation for developing more realistic process theories of the dynamics of internationalization. To move beyond variables based research, descriptive accounts of change and stage models to theories and research that deal directly with the dynamics of internationalization in context. What happens, how it happens and why it happens. To capture the richness and complexity of the internationalization processes of firms, networks and nations.

For policy makers and practitioners process models offer a better way of understanding and coping with the complexity and dynamics of the systems in which they operate and the role and importance of different factors. Managers do not manage variables as such, they live in a world of on-going processes and events. Variables are ways of measuring the characteristics of the actors, system and environment and how they change over time. But associations between such measures tells us little about how to change them. To bring about change actors have to act, interact and react and participate and respond to the different kinds of events taking place over time. This is the world of the manager and policymaker.

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