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A PARADOX? HOMOGENEITY IN THE IMP PERSPECTIVE

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Abstract

In this paper we discuss the assumption of heterogeneity within the IMP Perspective. We claim that the assumption of heterogeneity in the IMP Perspective actually comprises two assumptions: (A) that the value of a single resource depends on the combination in which it is used, and (B) that a single resource is always unique in the sense that it always differs from other resources. Furthermore, and on the basis of the main sources of the concept of heterogeneity, we claim that even if we assume that any resource is always heterogeneous, in both the (A) and the (B) sense, it is important to realise that the heterogeneity is neither always considered nor always made use of. In other words, we suggest that it is important to also consider 'that', 'how' and 'why' resource heterogeneity is disregarded. That is, we need to consider that actors choose between heterogeneity-exploring and homogeneity-creating action strategies. We discuss and exemplify how heterogeneity of both type (A) and (B) can be (1) disregarded or (2) made use of. In doing so we make use of the framework by Håkansson and Waluszewski (2002) who propose that it is useful to analyse networks in terms of four types of resources: products, facilities, business units and relationships. We propose that all four resource entities are heterogeneous in the (A) as well as the (B) sense, and that for each type of resource entity, both types of heterogeneity can be either (1) disregarded or (2) made use of. Throughout the paper, we make use of a case study for exemplifying the different conceptual types, we put forward, and the observation that these conceptual types are always mixed when action is taken in real, empirical settings. Thereby, we suggest (a) that managers always use only a fraction of and disregard most of both types of heterogeneity of those resources which they use and consider for creating efficiency and effectiveness in networks, and (b) that we need more research into how and why managers do so. Finally, we suggest that the concept of homogeneity as 'disregarded heterogeneity', in effect, is necessary for explaining the possibility of development as well as the existence of relationships.

Introduction

The assumption of resource heterogeneity is one of the main pillars on which the IMP Perspective rests. Even so, mention is most often only made of the 'underlying assumption' of (resource) heterogeneity – the content of the assumption is seldom discussed *per se*, and even more seldom are explicit discussions of implications of the assumption (i.e. consequences of the concept for analysis, agency, and organisational structures and processes). On these grounds the purpose of the paper is to discuss and question if sole attention should be paid to resource heterogeneity in the IMP Perspective, or if (and why) its 'opposite number' resource homogeneity should also be considered within the perspective. The paper is organised the following way: First, we introduce a case – on development and supplier selection – which will be used throughout the paper to exemplify the concepts and logic we propose. Secondly, we address the assumption of resource heterogeneity and claim that there are two types (A) and (B). We look into the main sources of the concepts – Penrose (1959) and Alchian and Demsetz (1992) – and discuss how and why these authors discussed heterogeneity in relation to homogeneity as 'disregarded heterogeneity'. In doing so, we also touch upon the assumption of bounded cognition/rationality. We then scrutinise some of the few contributions which have considered 'disregarding heterogeneity' within the IMP Perspective and we suggest that heterogeneity (of both type (A) and type (B)) can be either used or disregarded. We then relate these propositions to the 4 resource entity model proposed by Håkansson and Waluszewski (2002). Furthermore, we illustrate the use of the resulting concepts by analysing the case study. The paper ends with implications for the IMP Perspective and further research.

Case Study - Provision and Sourcing of an ASIC

In order to explicate the theoretical concepts and logic we discuss in this paper, we make use of one case throughout the paper. The case presented here is but a minor part of a large case study made in connection with the thesis by Gressetvold (2003). For further details and methodology, the reader may consult this thesis.

The company Nordic VLSI has developed the design for close to 200 different ASICs to be used by a wide range of business customers. ASIC is an acronym for Application Specific

Integrated Circuit and refers to a data chip that is developed for specific application by a user. Nordic VLSI develops the majority of these ASICs upon request from single customers. These customers in their turn make use of the ASIC as part of their products. One of the customers, VingCard, is a world-leading manufacturer of card operated locking-systems for the hotel and cruise industries. The company became a customer of Nordic VLSI after that it (VingCard) made a change from producing mechanical to producing electronic locking-systems. Hence, VingCard's latest solution for locking-systems makes use of an ASIC. While Nordic VLSI developed the ASIC for VingCard, VingCard itself developed all adjacent technologies, among other things the software and other hardware parts of the locking-system. In addition to designing the ASIC, Nordic VLSI was also responsible for manufacturing of the ASIC and made use of Alcatel Microelectronics as the fab. Every fab offers a limited number of manufacturing processes to its customers, and the costs of developing new manufacturing processes are high. The different fabs to a large extent carry out manufacturing processes based on 'internal' standards, communicated to others by means of a so-called 'blue book'. Through this 'blue book,' Nordic VLSI took Alcatel Microelectronics' manufacturing process into consideration from the initiation of the development of the ASIC for VingCard.

At first, Nordic VLSI's handling of component supplies consisted of co-ordinating the physical shipments of the ASIC from Alcatel Microelectronics to Kitron, the supplier of the control module of VingCard's locking-system of which the ASIC was a part. However, when VingCard started up actual manufacturing of electronic locking-systems, it also decided to implement a logistics system based on JIT-principles. This system was intended to embrace all components that entered into VingCard's products. One new policy element in the system was a principle of dual sourcing for all vital components. VingCard's intention with this principle was to bring stability into its supply chains and to reduce costs. As the control modules represented a considerable cost of the purchased components, VingCard wanted it to be handled according to the new principle of dual sourcing. In addition to Kitron, Lyng was therefore introduced as a second supplier of the control modules. As the ASIC had to be assembled into this control module, ASICs now had to be supplied directly to two companies. VingCard also desired to organise the manufacturing of the ASIC according to the new logistical principle, but experienced several difficulties with this. Firstly, Nordic VLSI, through handling the component supplies, possessed the property rights to the ASIC; this was settled in the contractual arrangement between the two companies. Secondly, this ASIC was adapted to Alcatel Microelectronics' manufacturing process in accordance with this

company's aforementioned 'blue book.' This meant that the ASIC, due to technical reasons, could not be manufactured by other fabs. Such difficulties concerning dual sourcing of ASICs are well-known by companies that develop and use this kind of product. VingCard, on the other hand, being a first-time user, was initially not aware of such difficulties but experienced that it was not able to implement its new logistics system unrestrictedly, as the company had no other sources for purchasing the ASIC than Nordic VLSI.

Sources of the Assumption of Heterogeneity within the IMP Perspective

In the IMP Perspective it seems as if heterogeneity is mainly used in order to draw attention to the assumption that *the value of a resource depends on the combination in which it is used*. Thereby is meant that a single element may appear different, and hence be of different value, if seen in different combinations. We shall refer to this as heterogeneity assumption (A). Relating this assumption to our case, we can think of any given ASIC as such an element. Used in combination with the other resources for which it has been designed, the ASIC has a high value, but used in other combinations its value is greatly reduced; perhaps even to zero. However, relying on Holmen and Pedersen (1999) and Holmen (2001) we suggest that the concept of heterogeneity actually is defined in two ways in the IMP Perspective. In addition to type (A) there is a type (B). Type (B) implies that *resources (within a group) are different*. This definition of resource heterogeneity is close to the definition used in the Resource Based View where 'heterogeneous resources' = 'different resources'. Using our case, we can say that the fact that each ASIC is specially designed for one particular application by one certain customer's means that the ASICs produced by Nordic VLSI constitute a group of resources in which each element is different from the other, thus representing heterogeneity of type B.

Within the IMP Perspective, it is primarily heterogeneity of type (A) that has been paid attention to. When this assumption of heterogeneity is proposed, mentioned or explained, reference is often made to the respective work by Penrose (1959) and Alchian and Demsetz (1972).

Heterogeneity - according to Penrose (1959)
As opposed to (macro)economists who had focused on markets, factors, and (firms-as-) production functions for explaining how the economy works, Penrose (1959) put forward the

central notion of 'resources' for understanding how 'real' firms and managers behave. The distinguishing feature of Penrose's resources is that they are heterogeneous in the sense that there are always unexplored features of a resource and, therefore, infinite possibilities for exploring it further. Resource heterogeneity was the core assumption of her 'theory of the growth of the firm' – that is, a firm grows and develops in a subset of the directions which its existing pool of heterogeneous resources enables. Firm growth = f(resource heterogeneity). However, Penrose (1959) did not only discuss heterogeneity – she also discussed its opposite number: homogeneity. As she states (1959, p.74-75) *"For many purposes it is possible to deal with rather broad categories of resources, overlooking the lack of homogeneity in the members of the category. [..] the sub-division of resources (into smaller categories) may proceed as far as it is useful, and according to whatever principles are most applicable for the problem at hand. The subdivision cannot go so far that each input is defined as a separate resource, however. The only purpose of devising a 'unit' of resources or services is to enable us to measure the number of units within a given category. If this number is always one, no purpose is served by the classification. There are many resources of which each unit is so much like every other unit that a homogeneous category can be established which includes a large number of units. [..] The chief problem is to obtain a classification related to the nature of the resource within which the required degree of homogeneity exists."* Hence, while Penrose (1959) stress the importance of considering resources as heterogeneous, she also points out that assuming (or focusing on) heterogeneity is not always useful. In other words she seems to imply that even if all resources are (possible to consider as being) heterogeneous it may, on some occasions, be more useful to disregard the heterogeneity and instead focus on homogeneity.

Heterogeneity – according to Alchian and Demsetz (1972)

Whereas Penrose (1959) is interested in explaining how firms grow, Alchian and Demsetz (1972) are interested in explaining the boundary of firms and the function of managers. Similarly to Penrose, Alchian and Demsetz (1972) assume that resources are heterogeneous – in the sense that a single resource can be used for many different purposes or combinations and that value of the resource may differ across combinations. With the assumption of heterogeneity, they propose that the boundary of a firm demarcates the area in which resources are regarded as heterogeneous (*within* the firm boundary) from the area in which resources are regarded as homogeneous (*beyond* the boundary of the firm, in markets). Firm boundary = f(resource heterogeneity). Thereby, they propose that an important function of

managers is that they can intimately observe how resources (mainly employees) can be used and perform in different combinations over time which, in turn, endows managers with superior opportunities for using and valuating the internal resources. Management function = f(human resource heterogeneity). This, in fact, means that Alchian and Demsetz (1972) implicitly recognise both the existence of heterogeneity and the possibility of ignoring it. In other words, they seem to equate homogeneity with 'disregarded heterogeneity' (outside the firm, in markets). Furthermore, the fact that they explain the boundaries of firms in this manner implies that they recognise the benefits of disregarding some part of the heterogeneity which they assume to exist – if there were no such benefits, there would be one firm only.

Using Hayek (1952) for Understanding Penrose (1959) and Alchian and Demsetz (1972)

In order to understand the duality between heterogeneity *and* homogeneity which both Penrose (1959) and Alchian and Demsetz (1972) seem to subscribe to, we may rely on Hayek (1952) and his contribution to theoretical psychology. Hayek (1952) discusses sensory perception – how we experience the world. In the introduction to his thesis, it is stated (1952, p.xviii) that *"sensory perception must be regarded as an act of classification. What we perceive are never unique properties of individual objects, but always only properties which the objects have in common with other objects. Perception is thus always an interpretation, the placing of something into one or several classes of objects."*

Hayek (1952) seems to come to this conclusion by a number of assumptions. He assumes that *"there exists [..] no one-to-one correspondence between the kinds (or the physical properties) of the different physical stimuli and the dimensions in which they can vary, on the one hand, and the different kinds of sensory qualities which they produce and their various dimensions, on the other"* (Hayek, 1952, p.14). This leads him to conclude that *"the physical order differs from the phenomenal order.[..] While they are in some measure similar, and while we owe it to this similarity that we can find our way about in the physical world, they are, as we have seen, far from being identical"* (Hayek, 1952, p.38). One implication of this is that so long as physically different elements, whatever other properties they may possess, are capable of acting in the same way, their other properties are irrelevant for our understanding of them as members of the same category (Hayek, 1952, p.46). On the basis of this, Hayek defines classification as *"a process in which on each occasion on which a certain recurring event*

happens it produces the same specific effect, and where the effects produced by any one kind of such events may be either the same or different from those which any other kind of event produces in a similar manner. All the different events which whenever they occur produce the same effect will be said to be events of the same class, and the fact that every one of them produces the same effect will be the sole criterion which makes them members of the same class" (Hayek, 1952, p.48). Hence, Hayek (1952) seems to assume that heterogeneity is something which 'exists' in a 'physical' sense, but that individuals (choose to) place elements into classes *within which* there is some degree of homogeneity and *among* which there is some degree of heterogeneity. Furthermore, Hayek (1952) seems to imply that some disregard of heterogeneity – via a process of 'homogenisation' – is necessary in order for individuals (and firms) to be able to deal with the world.

Bounded Rationality/Cognition

Basically, Hayek (1952) points out that people tend to see 'reality' not as it 'is', but as they frame and classify it, and that even if they have quite some latitude in choosing the classifications, these must be partially compatible with the 'reality' they represent (if not, they may need revision). Quite comparable issues have been addressed by other researchers within various streams of theorising. For example, within the field of language and cognition, Eco (2000) discusses categorisation, cognitive types and nuclear content of elements and stresses the possibilities for assigning a single element to different types of categories – 'is Ayers Rock a stone or a mountain, or?' Within economics, researchers addressing framing and cognition often do so with the concept of 'bounded rationality' (or 'bounded cognition'). Bounded rationality dates back to Simon (see e.g. Simon (1997)) who criticised orthodox economic theory for its inability to conceptualise and explain administrative behaviour. Since then, the concept has been taken up by a large number of researchers within many (sub)streams of theorising. Bounded rationality/cognition can be defined as *"an imperfect ability to perceive, learn about, compare, remember, and order alternatives"* (cf. Witt, 1996). However, different researchers define and use bounded rationality/cognition in quite different ways. As noted by Foss (2001), there are 'richer or poorer notions' of bounded rationality/cognition. Whereas poorer notions mainly evoke bounded rationality/cognition as a kind of 'background assumption', 'richer notions' takes into account *"the wider consequences of imperfect information processing in terms of the strategies or rules that agents may follow*

to cope with their imperfect computational abilities, the cognitive frames for representing reality they construct, and the cognitive biases and errors they suffer from" (Foss, 2001, p.411). In short, researchers focusing on (individuals') decision making tend to use and discuss bounded rationality/cognition in more detail. Instead of explaining general regularities (such as the boundary of the firm), they try to *"explore mechanisms, that is, causal connections that may or may not be triggered in specific situations [..for example..] how a specific manifestation of bounded rationality – such as, say, reference level biases – translate into transaction costs confronted by agents in a specific model setting, and how this influences the contract or governance structure chosen by these agents to regulate their trade"* (Foss, 2001, p.412). In short, such researchers focus on finding generalisable knowledge regarding *agents' strategies for dealing with 'reality' given their bounded rationality/cognition.* Among such researchers we find, for example, Loasby (1976) and (1999) who proposes that bounded cognition is the reason why no individual (or firm) can deal with (even a subset of) the complex world in its heterogeneous 'totality'.

Heterogeneity, Homogeneity, and Bounded Rationality – in the IMP Perspective

The concept of heterogeneity (type (A)) is mentioned in the majority of publications based on the IMP Perspective – primarily for explaining why development is more important to consider than static situations. Development = f(heterogeneity). The concept of heterogeneity (type (B)) is primarily used for explaining the need for unique relationships since no counterparts are identical. Relationships = f(heterogeneity).

As mentioned earlier, Penrose (1959) and Alchian and Demsetz (1972) are important sources of the concept of heterogeneity within the IMP Perspective. However, both sources discuss heterogeneity *and* homogeneity. Furthermore, they seem to have heterogeneity as the basic point of departure but to also consider the possibility of disregarding it even if aware of it – or not being aware of it at all. In order to understand the duality between heterogeneity and homogeneity, we inquired into the lines of reasoning proposed by Hayek (1952), Simon (1997), Loasby (1976) and (1999) and Foss (2001). We then encountered the assumption of bounded rationality/cognition, which seems to be related, in some way or another, to the duality between heterogeneity and homogeneity. Therefore, we shall now address how

homogeneity and bounded rationality/cognition are dealt with in the IMP Perspective, and the extent to which these issues are combined with the assumption of heterogeneity.

In general, we contend that homogeneity and bounded rationality/cognition are considered, but only infrequently, and usually very implicitly in the IMP Perspective. Since they are not combined, we shall address them in turn – starting off with homogeneity.

Among the few (early) discussions of the existence of homogeneity in the IMP Perspective, we find Håkansson (1993) and Håkansson (1994). Håkansson (1993) discusses 'networks as a mechanism to develop resources', and Håkansson (1994) discusses 'economics of technological relationships'. In both contributions it is stressed that the IMP Perspective differs from 'common' economic perspectives by taking the assumption of heterogeneity as opposed to 'homogeneity' of resources as a point of departure. However, this does not seem to imply that homogeneity is altogether ignored or considered unimportant in the two contributions. For example, in Håkansson (1993, p.214) it is stressed that *"the heterogeneity is probably on such a level that it is overwhelming for every single company. There is no possibility for each of them to 'utilize' all of it. The question is more one of selecting some aspects and ignoring others"*. In addition, in Håkansson (1994, p.266) it is argued that there are *"reasons to take advantage of heterogeneity, but there are clearly positive effects of treating counterparts as homogeneous. The most obvious reason is the economics of scale which occur when, for example, customers are treated in a homogeneous way by a seller [..] scale effects can occur if there is some homogeneous part of the solution, if there is some specific activity or component which can be applied on a larger scale by the counterpart, for example to serve several customers"*. Furthermore, homogeneity is actually seen as a prerequisite for the existence of relationships in the sense that *"close relationships become instrumental when there exists some homogeneous part of the heterogeneity"* (Håkansson, 1994, p.267).

In a later contribution, resource heterogeneity and the possibility of disregarding it, is also implicitly considered. As Håkansson and Waluszewski (2002) formulate it: *"resources can be seen as a source of development or as a point of reference"* (p.40), *"different actors' perspectives of physical and social resources also have a strong impact on economic life. As resources are formed through human interaction, image is an important ingredient that plays a central role in business life"* (p.39), and the features of resources *"are interpreted,*

developed and preceded by individuals" (p.38). Although they do not explicitly discuss these issues in relation to the concepts of heterogeneity and bounded rationality/cognition, Håkansson and Waluszewski (2002) seem to acknowledge (1) that resource heterogeneity may be disregarded – as when a resource is used as a point of references instead of a source of development, (2) that the way in which resources are viewed depends on how individuals view and classify them – as when individuals' perspectives and images influence how a resource is seen, and therefore (3) that individuals and their frames are crucial for resource development.

Based on the discussion above, we propose that we need to consider more explicitly the duality between heterogeneity and homogeneity. One way of dealing with this duality is by considering that both type (A) and type (B) can be either *used* or *disregarded*. Disregarding heterogeneity of type (A) basically means that one does not consider that a single resource may have other or additional uses than those already used (or known). Understanding how heterogeneity of type (B) can be disregarded is somewhat trickier. In order to understand how it is possible to disregard such heterogeneity we suggest the following definition: *two elements may appear to be (of) similar (value) when either is seen in one type of combination, but that the same two elements may appear to be (of) different (value) when either are seen in another type of combination*. To understand this we can consider the following example: We concluded above that the ASICs produced by Nordic VLSI represented heterogeneity of type B. However, in some combinations, the differentiating characteristics of the various ASICs may be disregarded, allowing all the ASICs to be considered as one, homogeneous group. For example, it may be possible to use the same routines used when re-ordering or paying for any one of the ASICs. The two types of heterogeneity, and what it implies to disregard each of these, are tentatively depicted in figure 1.

-----Insert Figure 1 around here-----

Furthermore, we propose that both types of resource heterogeneity, and the fact that it may be used or disregarded, are important and should be considered – more explicitly – in the IMP Perspective and that this has implications for (1) which phenomena and concepts are proposed (and which are disregarded) in the IMP Perspective, (2) how they are discussed and treated, and the (3) managerial implications derivable from the perspective. In fact, we argue that these issues would be obvious to address in relation to the assumption of bounded rationality/

cognition since it allows us to disregard 'real' heterogeneity thereby creating homogeneity. Although 'bounded rationality' is evoked within the IMP Perspective (cf. Håkansson and Johanson (1992) and Håkansson and Snehota (1995)), the concept is dealt with in a 'background sort of way' (cf. Foss, 2001) and there is no explicit discussion of the assumption in relation to other assumptions, and the consequences for action and the emergence of relationships, firm boundaries, and network structures.

Heterogeneity and the 4 Resource Entity Model

So far, we have not discerned between different types of resources but discussed them as 'one homogenous lot'. Recently, however, Håkansson and Waluszewski (2002) have proposed that it is useful to discern between four different types of resources: products, production facilities, business units, and business relationships. In this paper, we shall not enter into any kind of comprehensive discussion of the merit of the framework, nor shall we consider that interaction between the different entities is proposed to be the process, which creates and enables development. Instead, we shall 'just' combine the resource categories in the framework with the concepts and assumptions proposed earlier in the paper. Hence, we apply the logic that the two types of heterogeneity proposed, and the assumptions that both can, and often are, disregarded rather than made use of, should make sense in relation to all four types of resource entities proposed by Håkansson and Waluszewski (2002). By combining their model with our concepts and propositions, we get the following table (table 1). In order to test whether or not we could make immediate sense of the 16 categories, which emerge, we made use of our empirical insight for coming up with examples for each of the categories (see table 1, far-right column). The empirical insights stem primarily from the theses by Holmen (2001) on the development of egg-shaped concrete pipes, Forbord (2003) on the development of the use of milk, and Gressetvold (2003) on the development of electronic components in various relationships.

-----Insert Table 1 around here-----

During this process we realised that it was possible to identify a huge number of examples for each category. Therefore, we have delimited the examples presented to supply-side related aspects only, although it would have been equally possible to focus on customers, to look

inside a company etc. Furthermore, we have delimited the examples to existing resources and neither pay attention to creation of new resources (of whichever type) nor to creation of new characteristics of existing resources (of whichever type).

Case Analysis

In order to assess the efficacy of the concepts when used in combination for understanding an empirical phenomenon, we shall now analyse the case by means of the 16 concepts and associated action strategies (cf. table 1). In order to keep the analysis short, we only focus on VingCard and some of its action strategies in relation to the four different resource types. Regarding *products*, several products are involved in the case. If we look at the focal product, the ASIC, VingCard seems to apply the logics of 'type (A) – use' and 'type (B) – disregard'. VingCard intends to investigate if Nordic VLSI's product, an ASIC, can be used in combination with VingCard's products. Furthermore, VingCard seems to disregard that the ASIC may have characteristics which differentiate it from other ASICs. VingCard does not seem to realise that an ASIC is developed and used for a specific application, and that the designing firm owns the property rights to it. Regarding *facilities*, VingCard seems to apply the logics of 'type (A) – use' and 'type (B) – disregard' in relation to Alcatel Microelectronics. VingCard expects that some fab or another will be able to use its facilities for producing an ASIC for the locking systems. However, at the same time VingCard disregards (or is unaware of) the differences which exists among the production processes (and blue books) of different fabs. This seems to be the reason why VingCard intends to have dual supply of the ASIC but also the reason why VingCard has to give up its dual sourcing policy for ASICs. Regarding *relationships*, we can observe that VingCard applies the logic of 'type (B) – disregard' in the sense that it disregards the characteristics which makes the relationships between Nordic VLSI and Alcatel Microelectronics unique and non-homogenisable from Nordic VLSI's (possible) relationships to other fabs. VingCard also applies 'type (A) - use' in relation to its other (complementary) suppliers by using some of its existing suppliers for the new ASIC-based locking system. In relation to *business units*, VingCard seems to apply the logics of 'type (A) – disregard' and 'type (B) – disregard'. VingCard is aware that Nordic VLSI so far primarily has dealt with customers who are professional users of ASICs, familiar with the routines involved in design, production and use of ASICs. Even so, VingCard does not consider that its, as a customer, represents a number of

challenges for and development of Nordic VLSI's capabilities. In this manner, VingCard does not regard its emerging use of Nordic VLSI as a case of 'finding new uses of Nordic VLSI as a business unit' and the consequent need for experimentation with and development of Nordic VLSI's capabilities. In relation to Alcatel Microelectronics, VingCard apply the logic of 'type (B) – disregard'. Being unfamiliar with the field of ASICs, VingCard is unable to notice that Alcatel Microelectronics may have capabilities, which sets it (partially) apart from other manufacturers of ASICs. Its unfamiliarity with the field does not enable it to see the heterogeneity amongst ASIC manufacturers, but regards these as a homogeneous lot (of type (B)).

The case illustrates a number of issues. Firstly, it shows that a single episode, when seen from a single actor's point of view, can involve dealing with (1) the heterogeneity of all four types of resource entities, (2) both types of resource heterogeneity in relation to these resource entities and, furthermore, (3) applying different action strategies towards dealing with the heterogeneity. We expect that, if we had analysed other actors (in addition to VingCard), similar findings would have applied to these. Secondly, the case shows that when an actor applies the strategy of disregarding heterogeneity, this approach may sometimes be invalidated – some parts of the heterogeneity simply cannot be disregarded (from a technological and/or economic point of view) in a particular situation. It is important to understand that this in itself does not invalidate 'disregarding heterogeneity' as an action strategy. In fact, disregarding heterogeneity is partly necessitated by the limitations on the human decision-maker (bounded rationality/cognition), and is partly a sound strategy to reap certain advantages from similarities (of activities) and to enable exploration and exploitation (of resources). However, the case analysis points to the fact that the action strategy of disregarding heterogeneity will sometimes fail. Thirdly, we can observe that even if the case concerns technical development, a lot of heterogeneity (of type (A)) is not used. Hence, development is not just a process of exploring heterogeneity (of type (A)), it also involves disregarding a lot of heterogeneity – not all resource elements involved in development can be treated as variables to be explored. The case also shows that homogeneity of type (B) – among manufacturers of ASICs – may be assumed, but that this action strategy may later be revised to considering heterogeneity of type (B), if the usefulness of the former action strategy (disregard heterogeneity) is falsified.

Implications

We suggest:

(a) that homogeneity is, in fact, considered in the IMP Perspective, but needs to be paid much more explicit attention,

(b) that one way in which homogeneity can be considered in the IMP Perspective is to view it as a consequence of the assumption of heterogeneity when combined with the assumption of bounded rationality/cognition – which, at present, is 'recognised' within the IMP Perspective but which is not really made serious use of,

(c) that the assumption of heterogeneity comprises (at least) two different aspects – heterogeneity of type (A) and type (B), and

(d) that both of these may be discussed in relation to alternative action strategies of 'disregard or use'.

Within the IMP Perspective *development* and (connected) *relationships* seem to be the two main phenomena which are (partially) explained on the basis of heterogeneity. *Development* is regarded as possible because 'there is heterogeneity', and relationships are regarded as beneficial because 'counterparts are heterogeneous'. We argue that *development* may be better explained by considering both heterogeneity and homogeneity, and bounded rationality/cognition. In particular, our case showed that development involves taking into account some of the heterogeneity of some resources while, at the same time, disregarding a lot (in fact, most) of the heterogeneity of most resources – thereby regarding these as homogeneous. Several researchers within the IMP Perspective indirectly pay attention to these issues, such as Holmen (2001), Forbord (2003), Gressetvold (2003), and Hjelmgren (2003). Hence, heterogeneity may be a prerequisite for development, but homogeneity may be equally necessary because no development would be possible if the action strategy used is to 'use the heterogeneity' of all resources involved in a development process. In short, development = f(heterogeneity, bounded rationality/cognition, homogeneity).

Similarly, we argue that *relationships* (and networks) may be better explained as = f(heterogeneity, bounded rationality/cognition, and homogeneity). We did not address this issue in our case, but it is mentioned in Håkansson (1994) and implicitly discussed in Dubois (1998) on the basis of Richardson (1972). Dubois (1998) argues that relationships exist when activities of two firms are closely complementary and dissimilar. However, she also points out

that it is important for a firm to capture similarities among a company's different relationships. Such similarities (or connections), in effect, can be viewed as dimensions in which two or more relationships are 'homogenous' (type (B)). In short, there must be "some homogeneous part of the heterogeneity" (Håkansson, 1994, p.267) in order for relationships to be useful. If no dimensions can be identified along which a single relationship can be considered as part of a homogenous group (of minimum two) relationships, there is no (long-term) economic basis for the existence of the relationship. In short, in order for a relationship to exist, it must be connected to other relationships, and in order for such connections to exist, some homogeneity (similarity) must exist – or be made to exist. Thereby, future research may inquire into the concepts of and suggestions related to partial homogeneity (Alderson, 1965) and partial heterogeneity, as well as to the dynamics – creation, existence, and decay – of heterogeneity and homogeneity over time.

We suggest that researchers within the IMP Perspective in future pay more attention to connecting the assumption related to actors (bounded rationality/cognition) to the assumptions related to resources (heterogeneity, homogeneity). This implies that we need more research into the action strategies which actors apply in relation to resources of whichever type – including business relationships.

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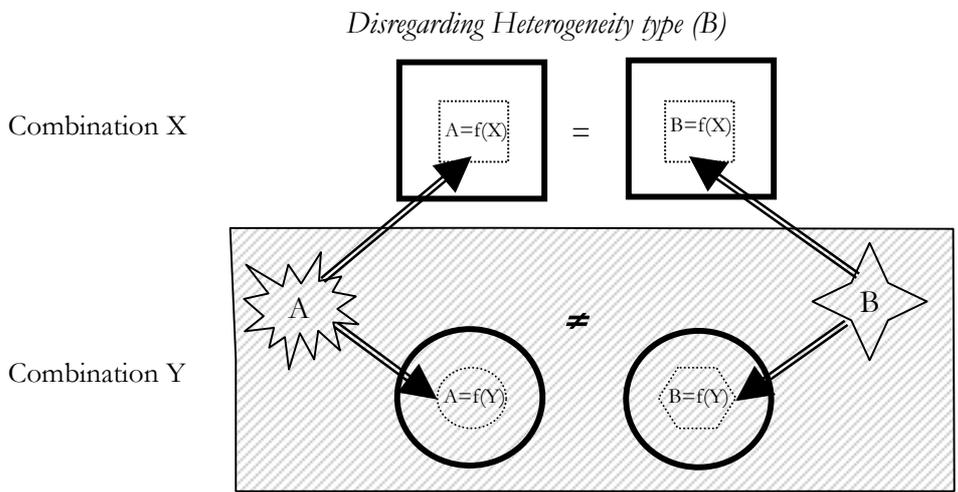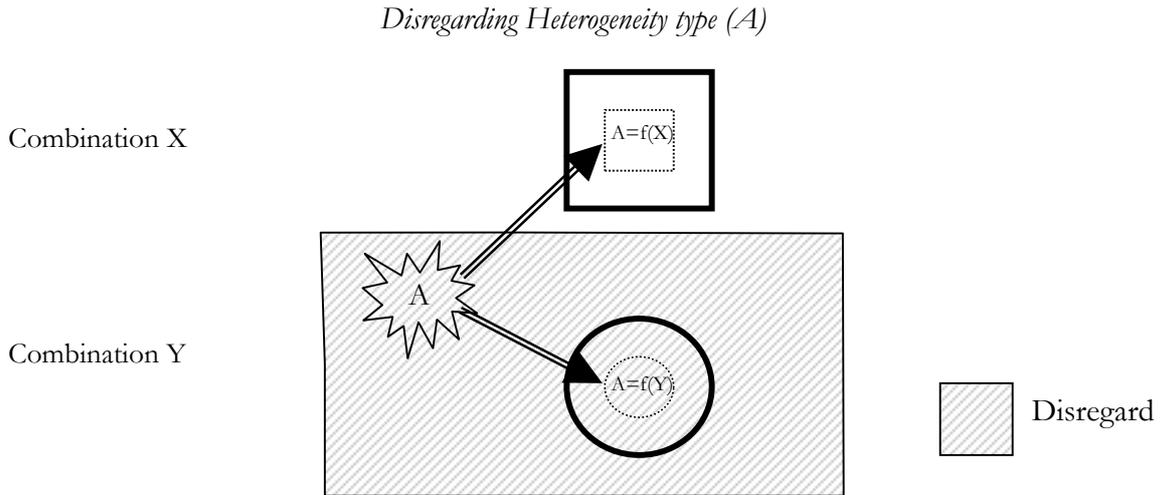
Figure 1: Types of Heterogeneity and Disregard

Heterogeneity type (A)   *Heterogeneity type (B)*

Combination X

A=f(X)

A

Combination Y

A=f(Y)

A ≠ B

A

Heterogeneous
resources (a,b)…

B

….put into use
in….

X

…combina-
tions (x,y)…

Y

..resulting in view
of resource as
function of
combination

Disregarding Heterogeneity type (A)

Combination X

A=f(X)

A

Combination Y

A=f(Y)

Disregard

Disregarding Heterogeneity type (B)

Combination X

A=f(X) = B=f(X)

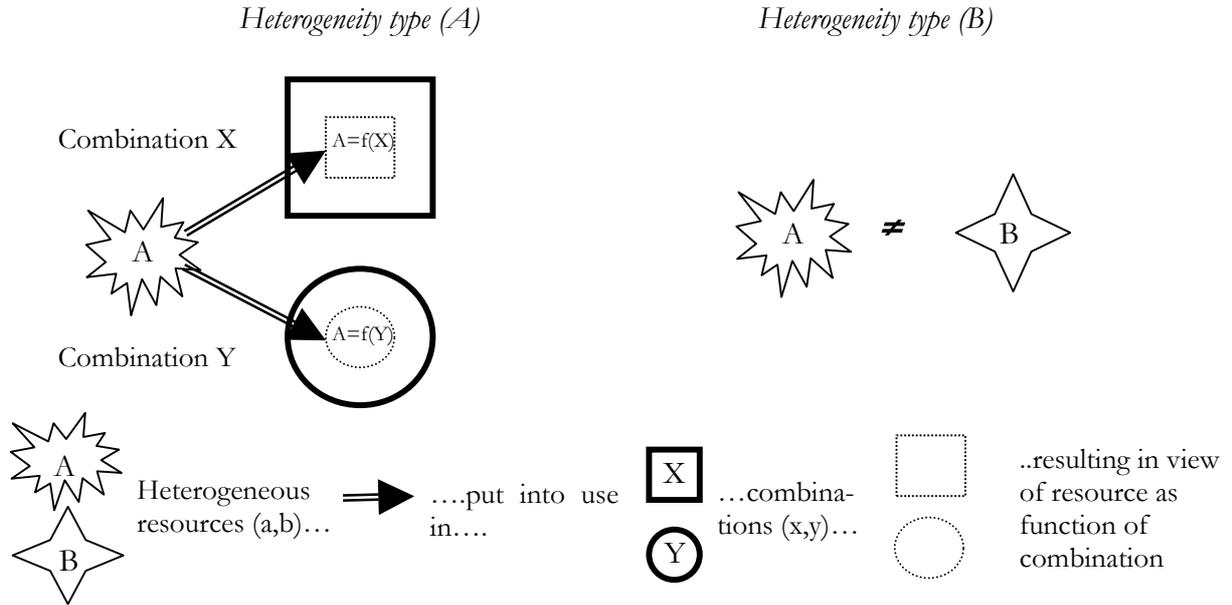A ≠ B

Combination Y

A=f(Y)   B=f(Y)

Table 1: Heterogeneity and Action Strategies related to the 4 Resource Entities

Resource	Hetero-geneity	Action strategy	Main content and implication of action strategy	Examples
Product	Type (A)	Disregard	Focus on combinations in which a product it known to be useful	Keep on using the product of a particular supplier in the same way as it has been used before
		Use	Focus on finding new combinations in which the product may be useful	Finding (new) ways of using a supplier's product which has been made for other uses, modified re-buy
	Type (B)	Disregard	Disregard characteristics which may differentiate the product from other products which it seems partially similar to	Dual or multiple sourcing existing products, electronic auctions, competitive tender procedures
		Use	Pay attention to characteristics which differentiate the product from other products which it seems partially similar to	Sole, single or parallel sourcing for existing products
Facility	Type (A)	Disregard	Focus on combinations in which the facility it known to be useful	Letting supplier repeat well-known production plans for existing models
		Use	Focus on finding new combinations in which the facility may be useful	Developing new products with characteristics of supplier's facility as (one) point of departure
	Type (B)	Disregard	Disregard characteristics which may differentiate the facility from other facilities which it seems partially similar to	Dual or multiple sourcing for planned future products yet to be developed
		Use	Pay attention to characteristics which differentiate the facility from other facilities which it seems partially similar to	Sole, single or parallel sourcing for planned future products yet to be developed
Relationship	Type (A)	Disregard	Keep on using the relationship for what is already used for	Routinisation of purchasing processes, straight re-buy
		Use	Try to find new combinations in which the relationship may be useful	Introducing a supplier to complementary suppliers with whom the focal supplier has not yet interacted
	Type (B)	Disregard	Disregard characteristics which may differentiate the relationship from other relationships which it seems partially similar to	Transferring supply schemes from one supplier to another supplier
		Use	Pay attention to characteristics which differentiate the relationship from other relationships which it seems partially similar to	Modifying quality assurance procedures used for one supplier to fit another supplier
Business Unit	Type (A)	Disregard	Focus on combinations in which the business unit it known to be useful	Using capabilities of a supplier which have been used before, e.g. for making 'comparable' designs
		Use	Focus on finding new combinations in which the business unit may be useful	Using capabilities of a supplier which have not yet been used by the company
	Type (B)	Disregard	Disregard characteristics which may differentiate the business unit from other business units which it seems partially similar to	Competitive tender procedures, switching to new, unknown supplier, supplier portfolio models
		Use	Pay attention to characteristics which differentiate the business unit from other business units which it seems partially similar to	Letting different suppliers, with different capabilities, develop alternative designs of new product