

## 10. CONCLUSIONS

The analysis in each of the scenario chapters indicates that not all exchange structures are expected to be stable in all environments. Table 1 summarizes the relationship between scenario conditions and stable exchange structures. Underlying the hypothesized stability of any exchange structure is a required consistency between the scenario conditions and the constitutive rules of the structure. Our analysis has indicated that market exchange structures are more likely to survive and remain stable in the scenarios with low damage to institutions. The nonmarket structures are more dominant in the scenarios where institutional damage is great.

Consideration of the combination of rules vectors that constitutes the overall exchange process in each scenario yields a range of tentative conclusions. Of particular significance are the definition of property rights; currency versus barter, including problems of credit; demand and supply, including changing wants; modes of production, including the division and scale of labor; and issues of trust and authority. Additionally, it is appropriate to consider the routes by which exchange structures could develop towards the eventual restoration of a pre-attack industrial economy.

Table 1. Exchange structures combine differently in each scenario

Exchange Structure	Scenario			
	Best Case	Worst Case	Resource Abundance	Institution Intensive
<u>Nonmarket</u>				
Subsistence		x	x	
Prestige		x	x	
Intimate	x	x	x	
<u>Market</u>				
Peasant		x	x	x
Associational	x	x		x
Criminal	x	x		x
Perfect Competition	x			
Monopoly	x	x		x
Imperfect Competition	x			x
Oligopoly	x		x	x

## 10.1 PROPERTY RIGHTS

Our examination of survival scenarios has shown that previous studies were right to emphasize the importance of establishing property rights for post-attack recovery. However, prescriptions to restore pre-attack private property rights need to be tempered by consideration of the level of survival for both resources and institutions.

Our examination of property rights at different levels of survival indicates that, at low levels of institutional survival, i.e., the worst case and resource abundance scenarios, specific property rights will not be definable by centralized policy, but will emerge from the necessity of what goods survive combined with the particular vision of distributive justice that predominates among the survivors.

Private property owned by anonymous shareholders, e.g., corporate property or unclaimed lands, is likely to be a prime candidate for redistribution. In contrast, a community's common knowledge of the ownership of lands and homes by identifiable individuals probably will be respected where possible. However, even if survivors desire to maintain pre-attack property rights, the collapse of currency and the whole structure of financial debt, would lead to serious and widespread disputes about the just reallocation of surviving real property to compensate for the loss of financial entitlements, e.g., savings accounts and personal debts. Destruction of land registries, mortgage records, vehicle and boat registries, and banking records would make settlement of such disputes all the more difficult as would the absence of consensual authority to adjudicate.

Even in the institution intensive scenario, the governing authority might not do best by supporting all pre-attack private property rights. Long-term recovery might be better served by the avoidance of civil unrest and the promotion of social bonding through partial compensatory reallocation on deep-pocket principles or participation in common property rights. Common property rules may create the incentives for individuals to act in the interests of the whole. Such actions might follow from the need to demonstrate government response to the demand for public intervention into market activities.

A common property system would make fixed allocations of goods and services to individual and group members. Efficiency may still be promoted under a common property system as long as transferability of these individual shares is preserved. But, by displaying fairness in the initial allocations at the beginning of the production/consumption process, rather than through redistributive activities at the end of it, the rule maker demonstrates a commitment to equity during the critical early period of recovery. Over time, as the fairness of the exchange environment and trust in trading partners is reestablished, the environment is more conducive to exploiting gains from trade and the establishment of greater individual control over resources.

The only scenario in which there is a prima facie case for the unaltered maintenance of pre-attack private property rights is the best case. In other scenarios, some redefinition of property rights is

highly likely, especially where there is little institutional infrastructure or few resources to enforce pre-attack private-property rules.

## 10.2 CURRENCY VERSUS BARTER

Prior analyses have argued that the restoration of currency is a priority for post-attack recovery in order to avoid the inefficiencies of barter. In this respect, they share the prejudice that barter is necessarily less efficient than currency because it imposes high transaction costs.

These costs arise from the need for traders to negotiate face-to-face and because information, in the way of a price signal, does not spread to the rest of the market. Furthermore, traders may not know what others desire, or there may be difficulties displaying and transporting goods for exchange. However, there are conditions where barter can be more efficient than cash transactions.

Where currency is in limited supply or has limited credibility, but labor services are available, transaction costs will be lower if a trader can swap labor for goods directly, as in the resource abundance scenario. In other instances, barter may overcome informational inefficiencies in a changing environment. Where prices are established by customary allocation (as in the worst case) or command levels, or simply take time to change (as in the institution intensive scenario) traders may not have information on how demand and supply information has changed. In these conditions, barter may encourage continuous transactions in an uncertain environment.

Centralized currency is entirely dependent on the credibility of the institution that underwrites it. No such institutional framework exists under the worst case or resource abundance conditions of survival. In these cases, currency, or close substitutes, may emerge from a quite unexpected source. Specie money, like gold coin, may well derive from prestige-exchange items that initially have fixed values in a restricted sphere, e.g., Kwakiutl coppers. These scarce goods cannot be exchanged for what are considered commonplace, or non-prestige, goods. However, those that are durable act as a store of value. Those that are most liquid become exchangeable, at traditionally fixed rates, for all other prestige goods, though not for commonplace goods. Those that fulfill both conditions become specialized currencies within the prestige system.

True money, a general medium of exchange, may emerge in at least two ways. First, through an innovation in the rules that permits the specialized prestige currency to be exchanged for commonplace goods (e.g., gold). Second, through the introduction of a novel commodity that is not traditionally defined as either a commonplace or a prestige good (e.g., Western paper money in tribal societies) and can, therefore, be used as a medium through which both types of goods may be traded for each other. Such innovations may be the result of convenience or necessity.

We have seen that the prestige economy is inextricably linked to conspicuous consumption and, sometimes, the extravagant destruction of property. If it were to occur under the worst case or resource abundance scenarios, it would be a prime target for Greene, Stokely and Christian's (1979:17) exhortation to proscribe non-essential activities, especially those that waste goods in short supply. In following this prescription, it is possible that post-disaster development of new currencies may, in fact, be obstructed or delayed.

The delayed reciprocity characteristic of prestige exchange may be a precursor of credit. Credit is necessary for coordinating trading activities where sale and purchase are not spatially or temporally coterminous. The risk imposed on the creditor, who has restricted information on the debtor and limited opportunities for mitigation, is a powerful disincentive for the emergence of a credit market.

However, an alternating balance of running debt is a powerful means of promoting social bonds between exchange partners. Prestige exchanges encourage this kind of risk taking between traders, who show off their status and wealth precisely by displaying how much they stand to lose if their partner defaults. At the same time, the action signals good faith and develops an atmosphere of trust, as well as rivalry. As the prestige network expands, the use of delayed reciprocity for for prestige prestations may encourage a growing population of traders to extend credit in the non-prestige exchanges. This is yet another reason to be very careful in attempting to restrict non-essential trading and conspicuous consumption on the road to post-attack recovery.

### 10.3 DEMAND AND SUPPLY

Many studies addressing economic recovery assume that the objective of post-attack policy actions is the immediate restoration of the capitalist industrial system. However, our analysis indicates that more attention must be focused on the process of conferring value on goods after nuclear war.

First, there will be major shifts in supply and demand conditions for any good. This occurs where all resources to produce the good become scarce, as in the institution intensive or worst case scenarios, or where its ability to satisfy the wants of demanders is destroyed, as is the case under resource abundance. Hence, the supply of some items previously in common use may become scarce and prohibitively expensive, such as communication services, or they may become unusable, such as a tractor without gasoline or a viable substitute. In the first case, the good is very valuable, in the second it is not. Such changes in demand functions must be anticipated in preparing policies for the allocation of scarce resources in reconstruction, especially where missing markets for information prevent the planner from relying on price signals for guidance.

Second, because certain goods are unavailable, the uses to which they are put may systematically lose their attractiveness over time. This may occur in the resource abundance scenario as well as the low-

resource scenarios because the surviving social structures may have a strong incentive to shape the utility functions of their members to promote social cohesion. Hence, rules may emerge to limit the disruption caused by the expression of demands that cannot be satisfied. This socially modified demand function does not, therefore, rely on anti-technology or anti-industrial psychological reactions to nuclear war, but on the need to maintain social order and exchange itself. These changes in demand function must also be anticipated in planning for post-disaster recovery.

#### 10.4 CHANGING MODES OF PRODUCTION

The scale and locus of productive labor may shift radically in post-disaster markets. As diversity of labor expands, traditional rules become less and less applicable to the choice over how income is earned and what can be done with it. Thus, it is unclear whether diversity is really an outcome of the market process or the stimulus needed to generate it.

The expansion of labor skills into specialized areas undermines a system of universal traditional rules. When everyone can do everything, all possess the knowledge and means to regulate each other's behavior. It is the expert who defies universal regulation, not only because he has proprietary information, but also because every expert, by definition, possesses some specialized skills not found in the average member of society at large. Thus, many professionals and craftsmen are regulated by their own professional groups or guilds, rather than subject to general labor restrictions.

Labor specialization makes members of a social unit highly interdependent, hence more vulnerable to severe losses in the absence of our market society. The loss of markets in the resource abundance scenario and the destruction of resources in the worst case inevitably will reduce the range of goods and services. The resulting drastic reduction in specialized labor and development of a domestic mode of production will, in turn, reduce further the incentives for market behavior, and encourage reliance on fixed rules of allocation. Therefore, it may be very difficult for potential middlemen to rekindle true market activity.

#### 10.5 TRUST AND AUTHORITY

A pervasive problem facing all traders and decision makers in the novel circumstances of nuclear-war survival will be the issue of trust. In scenarios with low survival of institutions, licensing, certification, and consumer-rights authorities will be severely curtailed. People will experience increased difficulty in deciding who to trust, who has the skills that they advertise, and who will behave with fiduciary responsibility. The closer society is to pre-attack circumstances, the more trust will be retained by surviving institutions, such as those discharged with the responsibilities for economic recovery described in the best case.

However, even under the institution intensive conditions, surviving institutions will have to exercise great care in the planning and execution of policy. For example, failure to respond to popular demand for regulation under conditions of high infrastructure and low resources may well compromise government's authority as an equitable decision maker, capable of guiding post-war recovery. Equally dangerous, would be the tendency to regulate and even eliminate exchange activities that might make a valuable, if not always obvious, contribution to the restoration of currency, credit, and social cohesion.

One of the more critical problems to be faced by surviving institutions will be the maintenance of authority. This will be exacerbated where resources have suffered heavy damage, because the institutions will not be able to sustain long-term compliance through physical or material coercion.

Some argue that authority ultimately rests on the power to coerce. This view is certainly consistent with our description of the worst case. Analysis of the institution intensive scenario indicates that authority may stem equally from consensus about fixed allocations, where the patterns of exchange incentives are structured so as to promote social bonding. Under these conditions, the decision maker may be faced with a trade-off between promoting competitive incentives for allocations to encourage middleman activity, and maintaining the stability of civil society.

Where infrastructure is largely eliminated, especially as it is under the conditions of resource abundance, the emergence of prestige exchange may prove to be an important substitute for formal regulation, replacing legal sanctions by moral sanctions and possible loss of face. We argued in chapter eight that civil society, based on interpersonal trust and regulated by traditional ethics, was the condition for the emergence of the modern market system.

## 10.6 THE SHIFT FROM NON-MARKET TO MARKET STRUCTURES

Having considered some of the conclusions from the static analysis of the scenarios, we can also suggest some propositions about the dynamic features of economic recovery. Our scenarios can be seen as starting from a worst case system of low resources and low institutional survival that eventually moves to greater economic flexibility either through greater resource accumulation or institutional development. Thus, our resource abundance and institution intensive scenarios can be used as various pathways to the type of social organization that precedes the best case world.

Starting from the worst case, the presence of fixed rules of allocation within exchange structures may largely be responses to the severe transaction costs implied by initiating and completing exchanges. These rules will limit exchange opportunities by restricting permissible choices among traders. Thus, these rules may be an impediment to the development of a market process.

On the other hand, the traditional rules encourage activities that are necessary precursors to many social functions that constitute formal market structures. These activities include delayed reciprocity and the extension of credit; definition of property rights; signaling of good faith and credibility; and demonstration of sanctions for rule violations. We argued that these activities may encourage the development of credit and currency systems, an atmosphere of trust, and contract compliance among traders.

However, to have truly a market process, the rules of fixed allocations must begin to be superseded by rules that extend the transaction choices available to trading agents. Innovation in the rules leading to greater flexibility may be stimulated by either internal or external conditions, always present in a changing social and physical environment. Increases in the division of labor may be one such condition, contact with another exchange structure may be another.

Flexibility in the worst case system increases with greater resources (and less violent competition for basic survival) and greater institutional development as exchange relationships are fostered by a more regulated environment. However as flexibility is initially introduced to the structural rules, it promotes the opportunity to exploit gains from trade and contributes to a higher mobility of resources among traders and other exchange structures.

The expansion of potential trade opportunities combined with the established environment of civil order provides the incentives necessary for the emergence of middlemen. These market facilitators respond to incentives offered by the more flexible structure and can do so because the transaction costs of identification, negotiation, and enforcement are within tolerable levels. Perhaps facilitated by the development of a currency system, these middlemen act to separate the sale and purchase activities of traders, and thereby contribute further to the flexibility of rules governing what is now a market process.

The extent of competition in the rules of the market structure will ultimately depend upon the ability of the middlemen and corporate groups to obtain and direct resources for production and/or consumption as specified by the rules of property rights and extra-market regulation. Where these rules imply great flexibility over transaction options, and regulations imply free mobility of resources, there will be little need for middlemen, since traders can effect their own transactions directly, i.e., we are in, or close to, the world of perfect competition. Where these rules imply the opportunity for middle men to have exclusive control over resources and thus, their mobility, monopoly or oligopoly structures are possible, and even likely.

In essence, some constraint of choices, through market rules or through transaction costs, is necessary for the sustained profitability of middlemen and corporate groups. To the extent that these entities facilitate a market structure's ability to adapt to a changing environment, some encouragement of their continued presence may be desirable. For example, product differentiation through innovation is enhanced by patent rules, and information about product quality and

brand name differentiation is encouraged through trademark rules. By introducing some minor restrictions on market entry or exit, e.g., proprietary information, into the market structure to allow limited market power, the conditions for imperfect competition are created.

### 10.7 FURTHER RESEARCH

The analysis of the scenarios suggests a number of areas that warrant further research in order to understand better the implications of alternative policy prescriptions for economic recovery in the post-attack environment. Our analysis is exploratory, in the sense that it seeks to highlight the logical possibilities for exchange activities and then investigate the rules under which these activities may transpire. As a result, our study points out specific questions regarding exchange activity and economic recovery that must be investigated in a more narrowly focused analysis.

Three topics that require more investigation for policy purposes are property rights, currency versus barter, and trust and authority. We find these topics to be central concerns in each of the scenarios. We recommend that a more focused analysis of each topic be undertaken to provide the basis for concrete policy recommendations for FEMA disaster planning and post-disaster action in those cases where government institutions survive.

Two aspects of the problem not addressed by our study are the macroeconomic effects and the international implications of nuclear war. These issues are being addressed currently by other research studies sponsored by FEMA. In order to assess the potential routes of economic recovery fully, a complementary understanding of these various perspectives is required.

At a more micro-level of analysis, further insight on recovery options could be gained by testing empirically the behavioral responses of economic agents to changing economic conditions and rules governing exchange. This may be done using experimental economics techniques, where the behavioral responses of traders presented with various rules can be observed. Another possibility is to conduct field analyses of persons or groups that regularly engage in exchange activities that largely reflect the dominant rules of one or another of the exchange structures outlined in our study. This would allow a more detailed understanding of how people actually react to the exchange rules they face.

While our study does explore some aspects of the relative resource and institution survival, more detail aspects could assist in fine tuning policy prescriptions. For example, in the institution intensive scenario, we look at a world where it is assumed that it is largely government institutions that survive. Thus, our scenario suggests a world that has a large public sector relative to the private counterpart. Similarly, the resource abundance scenario assumes a world where agricultural and extraction resources are plentiful relative to other resource types. This could be extended to explore different



public/private sector and resource relationships by using a damage-assessment model to identify scenarios involving regional damages.

Finally, one of the unresolved issues that emerges from the research pertains to the dynamic properties of exchange structures. Specifically, we encourage more consideration of how market activities may be managed to evolve from structures that are characterized by fixed rules of allocation. Our study hints at a natural progression from fixed allocations to market activities when old rules are superseded by rules that extend the available transaction choices. In the case of western industrial economic evolution, this process took several hundred years. Thus, there remain unanswered questions regarding the dynamic possibilities under post-attack conditions. A logical next step in the research is to explore to what extent policy actions could be used to manage the evolution of exchange structures to produce desired economic systems.