3. EXCHANGE AND MARKET STRUCTURES AS RULES VECTORS

3.1 MODELING EXCHANGE AND MARKET STRUCTURES

In the last chapter, we argued that the free market exists where uncoerced parties, desiring to exchange goods or services, may do so where the options are wider than the simple choice to exchange or not. An appropriate level of abstraction at which to describe actual markets or exchange lies somewhere between this general definition and empirical descriptions of specific case studies. We propose an intermediate framework that generates a typology of non-market and market exchange structures. The most common typology of markets is based on the broad nature of goods or services traded, e.g., commodities, financial services, metals, etc. However, to ensure that our framework is properly bounded by the full range of logical possibilities, encompassing both formal and informal sectors of the economy, we have elected instead to base our typology on types of exchange structure.

The bounding variables for our framework of exchange structures are derived from literatures on both market and non-market exchange systems. The literature on formal markets already has reached a high level of abstraction, while the literature on non-market exchange tends to be strongly empirical, borrowing whatever abstract or explanatory concepts it uses from economic anthropology. However, a multivariate model that specifies the rules governing demand, supply and transaction options can be derived from both literatures. Finding the appropriate balance of abstraction and realism is often posed in the planning problems of large, complex systems (Katzner 1983).

The proposed model can be represented by a vector of rules constituting the exchange process. It goes beyond the traditional domain of economic market models, but as Friedman (1976:2) argues, such an approach is appropriate for the study of different types of economic organization:

> Economics, by our definition, is not concerned with all economic problems. It is a <u>social</u> science, and is therefore concerned primarily with those economic problems whose solutions involve the cooperation and interaction of different individuals. It is concerned with problems involving a single individual only insofar as the individual's behavior has implications for or effect upon other individuals. Furthermore, it is concerned not with the economic problem in the abstract, but with how a <u>particular</u> society solves its economic problems. Formally, the economic problem is the same for a Robinson Crusoe economy, a backward agricultural economy, a modern industrial society organized on a communistic basis, and a modern industrial society organized on a capitalistic basis. But these different societies use different institutional arrangements to solve their economic problems. Thus there is need for a different economics - or a

> different chapter in economics - for each kind of society. There turns out, in fact, to be much that is in common to the various chapters, but this cannot be required in advance; it is rather, one of the conclusions of economic science (original emphases).

Friedman's statement begs the question, how alike are exchange structures? Our framework is defined to be of sufficient generality to include exchanges in the financial, familial, or group membership spheres because the social phenomenon of exchange is common to all these activities. Yet, social science disciplines generally have distinguished different types of exchange, and then more or less restricted each disciplinary focus to a single type. As a result, economists have not said much about exchange for social membership, power, status, or prestige and anthropologists and sociologists have not said so much about exchange for financial gain. But as Smith (1974:320) notes, "Man's propensity to truck, barter, and exchange is but a special case of his propensity for social exchange in non-market and institutionally constrained market contexts."

Some of the disciplinary boundaries separating the social sciences have begun to dissolve, largely due to the growing body of interdisciplinary and extra-disciplinary research. Hirshleifer (1985:53) observes that as this work grows, it increases the strength of the evidence that, "There is only one social science." However, there remain two conceptual areas where the disciplinary interpretations continue to clash; rationality and reciprocity.

3.2 RATIONALITY

Rationality is a vast topic spanning mathematics, philosophy, and the social sciences. However, for the present purposes we confine ourselves to rationality in exchange behavior. In conventional microeconomics, rationality in exchange involves two major components; the basic motivation for action and the decision-making process by which actions are selected.

The first component, the motivation underlying exchange, refers to whether or not economic agents are motivated primarily by selfishness in their exchange behavior. Alternative motivations would be altruism and malevolence (i.e., the presence of intended maliciousness in actions). The underlying assumption for exchange motivation is not trivial since it bears directly upon the perceived gains from trade. Economists have preferred the selfishness assumption on the grounds that the other explanations can be made consistent with it by redefining what one means by gain. However, most often gains are still modeled as purely financial or material outcomes.

The second component of rationality in the economic literature refers to the process by which people select actions of exchange (Hirshleifer 1985:59):

> Rationality is an instrumental concept. In the lights of one's goals (preferences), if the means chosen (actions) are appropriate the individual is rational; if not, irrational. "Appropriate" here refers to method rather than result. Rational behavior is action calculated on the basis of rules of logic and other norms of validity. Owing to chance, good method may not always lead to good result (original emphases).

While this definition is uncontentious, the way in which it has been applied in economic modeling suggests a much more narrow definition. This narrower concept underlies models where economic agents are assumed to maximize utility or profits over the set of all feasible actions. But as Simon (1955) has argued, this view of rationality ignores the burden it places on a person's ability to reason and use information. Thus, a more realistic assumption is that individuals intend to be rational but are limited in their abilities to do so (Simon 1961).

To help understand the implications of different assumptions about rationality, it is useful to distinguish between outcome and process rationality. Outcome rationality describes a calculated process of choice by individuals in the pursuit of explicit ends. Decisions can be fully described as if made by an individual decision maker, i.e., within an individualistic, self-interested perspective. Collective decision making entities, such as households or firms, are treated as if they too were individual decision makers.

To select among alternatives within an outcome rational framework, decisions are based almost entirely on the individuals' knowledge of market information. Individuals make their decisions without recourse to other individuals. In the event that decision makers encounter uncertainty, they tend to base their decisions on probabilistic estimates of the possible outcomes. Whatever else individuals may be thinking, their decisions will appear to be consistent with mathematical optimization over the choice set. Finally, the factors influencing individual behavior can be reduced to a set of single decision points, each of whose influences can be considered as a separate entity.

There are central advantages to economics in the concept of outcome rationality, despite its admittedly simple assumptions about social behavior. Because of the emphasis on the representative individual, it is not necessary to describe fully the social system within which individuals behave. This facilitates the development of models that designate the degree, location, scheduling, and kind of interventions possible in various economic systems. It also allows for the construction of mathematically elegant models whose predictive value can be determined easily.

The limitation of outcome rationality revolves around its inability to explain confounding phenomena embedded in the surrounding social and cultural context of decision making. Conventional microeconomic theory has relied on a sharp distinction among ends, alternatives, and decision techniques in choosing among alternatives, but choice is permitted only about alternatives, not about ends or techniques. Yet, as Leibenstein

(1976) points out, decision techniques may well be treated as legitimate variables without any loss of coherence to economic analysis but, rather, resulting in models that better reflect real world decision making.

The assumption of process rationality is broader in scope than outcome rationality because the total social milieu of the individual is considered. Additionally, its focus includes the knowledge required by individuals in order for them to function in social systems that either promote or affect patterns of behavior. Studying the knowledge that these individuals have of social institutions, obligations, etc., thus becomes the point of departure relative to the outcome rational models.

Description of the decision behavior under the assumption of process rationality often requires a holistic framework. In this framework, elements tend to take on important attributes, or meaning, in relationship to all other elements being studied. Holism acknowledges that structured hierarchies of decision points must be hypothesized from a study of the relationship among elements. In other words, there must be explicit recognition that decisions are linked by more than just the passing of time.

The assumption of process rationality is applicable where economic agents may not have the freedom to choose over all the feasible actions where traditional rules apply. In fact, discrete exchanges may take place which are completely dictated by traditional rules of fixed allocations. This would be true where the individual has relinquished freedom of choice for group membership. While the more aggregate action still involves choice, i.e., to belong or not, at the transaction level, choice over alternative options is no longer available.

Finally, many examples once perceived as irrational behavior in outcome rational frameworks are now being explained as responses to high transaction costs. In fact, transaction cost analysis provides the link that can reconcile the outcome and process rational views. For example McClosky (1986) shows that historically, English farmers scattered their holdings of farmland not because they were irrational, but because insufficient markets existed in the farmers' social environment for spreading risk. Transaction cost analysis has also been used to investigate the creation of firms (Coase 1937), vertical integration (Williamson 1975), issuing coupons that lower prices in repeat transactions (Cremer 1984) as well as numerous other issues.

As the transaction-cost literature demonstrates, many of the problems raised by the outcome/process rationality debate can be resolved by focusing on the incentives facing economic agents rather than solely focusing on the behavioral motivations. Incentives are a combination of the various payoffs traders will receive depending on their choice of actions and the underlying individual motivations. As Sahlins (1972) and others argue, a more complete understanding of exchange incentives requires that we pay careful attention to the phenomenon of reciprocity.

3.3 RECIPROCITY

Sahlins (1972) defines three levels of reciprocal exchange. Positive reciprocity exists where the trader provides a socially recognized higher value of goods than he receives. Negative reciprocity exists when the trader attempts to maximize his return regardless of any socially recognized limits, "the attempt to get something for nothing with impunity." Reciprocity is balanced where the value of goods exchanged is recognized as roughly equivalent by both trading partners and other potential market participants. The traditional economic model of exchange has focused largely on balanced reciprocity where payment is made at the time of the transaction. However, in actual transactions, we observe variation in the timing of payment (Faith and Tollison 1980) and in the timing of price determination (Smith and Smith 1985). The empirical evidence makes it difficult to deny the presence of other types of reciprocity in actual economies.

Certainly from a social-cost perspective, negative reciprocity underlies the notion of monopoly rents or violation of property rights. Positive reciprocity, although often regarded as a misinterpretation (Becker 1976), remains a nagging attribute of many exchange activities. Rather than attempt to explain away the phenomenon of positive reciprocity, we find it fits very well into our exchange framework when we allow for the exchange incentives associated with social bonding, prestige and trust. Positive reciprocity creates a running debt balance (Mauss 1925, Davis 1972) between traders that provides the incentive for continued interactions and the display of good faith. The non-market and market literatures can be reconciled by simple recognition of this principle. And as Hirshleifer (1985:58) observes, the principle is quite universal: "Some willingness to forego selfish advantage, some element of genuine trust between trading partners or among business associates, almost always remains a necessity in the world of affairs."

It has been noted (Sahlins 1972, Lomnitz 1971) that the nature of reciprocity varies with the social distance between suppliers such that positive reciprocity occurs among family, kin, and close friends constituting a close-knit network (Bott 1957) that can be measured according to a range of network-theoretic variables (Holland and Leinhardt 1979, Gross and Rayner 1985). The goods most frequently exchanged in such structures are labor services, especially rudimentary specific skills, and commodities produced by group members with common skills, but at different times.

On the other hand, exchange in a monopolistic market structure is not characterized by close-knit networks, but is assumed to take place between non-intimates, unconstrained by rules arising from social proximity. Whereas the purpose of exchange between intimates with similar endowments is the creation and maintenance of social bonds by a continuing balance of debt, the incentive for a monopolist to exchange is maximization of income and unregulated accumulation of personal wealth and prestige.

Our framework overcomes a major shortcoming of many economic models of non-market exchange by explicitly recognizing reciprocity, the

transaction costs people face when making exchange decisions, and restrictions on choice. We allow for distinctions in the incentives to exchange and for distinctions in the allocation rules. Thus, we do not simply redefine all goals as self-interested and all choice among alternatives as outcome rational, as have many studies employing a higher level of analytical abstraction (Hirshleifer 1985). In our study, we are interested especially in the information on network formation and social membership, therefore, we must not explain it away.

3.4 A FRAMEWORK OF EXCHANGE STRUCTURES

Although the activities of informal markets might be considered an unaccounted part of the formal economy, there are major differences in the rules governing their operation. Despite their size, mainstream economics only recently has begun serious consideration of informal markets. The absence of these kinds of transactions from the formal market arena, if noticed at all, has been viewed simply as extra-market activity. Sociologists and anthropologists, to whom study of these markets has been left, have seldom brought mainstream economic perspectives to bear on this topic. Generally, they have preferred to assert that informal markets are not susceptible to elucidation through economic concepts because they exist not primarily for economic gain, but for social bonding and prestige.

Our model is an attempt to bring both informal and formal markets into a single explanatory framework through the notion that the primary goods sought in the informal sector are prestige and social bonding, mediated through exchange of commodities and services. Furthermore, traders, who normally operate in formal markets, may participate in order to reduce transaction costs, obtain goods below formal market prices, and obtain illicit goods. In this respect, it is clear that informal and formal markets exist in an environment of interdependence (Henry 1987). Thus, they differ from primitive markets, that also promote social bonding and prestige, in that the latter may be quite self-sufficient.

We argue that all exchange can be modeled as a combination of rules constituting an exchange structure or what Smith (1986) calls a microeconomic institution. Microeconomic systems emerge from the interaction of a set of traders and a set of rights and obligations (the microeconomic institution). The set of traders is comprised of economic agents, their resource endowments, and their knowledge endowments. The set of rights and obligations specifies the rights of agents to communicate in order to affect exchange, property rights, allocation rules, and cost-imputation rules. Thus, an institution may be seen as a set of rules that indicate the agents and options allowed in any transaction. A market is present where the rules enable the conditions for a market process to be fulfilled, otherwise, the institution is a non-market exchange structure.

3.5 RULES AND EXCHANGE STRUCTURES

Each exchange structure consists of a series of underlying rules constituting demand, supply, and transaction options. Before we can list the actual rules for each exchange structure, we must consider the concept of rules. For example, is there a difference between the explicit, normative rules expressed by the traders (participant rules) and the implicit rules (observer rules) that an analyst might use to describe the transactions he/she observes? If the participants' rules and the observers' rules differ, which do we choose to construct our vector, or is there some way to combine them?

The rules that enable a market to exist are described as constitutive rules. These are rules, such as the rules governing the movement of chess pieces, that compose human activities. Without these rules the activity, in this case a chess game, could not be said to exist. There may be other rules about how to do the activity well, for example, develop knights before bishops; but these are not essential to the game. These other rules, therefore, are not said to be constitutive but facilitative.

Constitutive rules may be prescriptive or descriptive. A prescriptive rule, such as "Thou shalt not kill," requires that the subject of the rule voluntarily behave in a certain fashion, to choose to commit or refrain from an act, as a condition of participating in the wider social activity. Refraining from murder (however homicide is defined locally) is a condition of participating as a full member of any society. Of course, voluntary adherence to prescriptive rules is usually encouraged by the threat of sanctions, most dramatically by exclusion from the wider society, more often by the imposition of deprivations. Chess players will not accept challenges from those who cheat or persistently refuse to learn the permissible moves. Serious offenders against social codes may be excluded from the enjoyment of civil society or subjected to a curtailment of liberty, depending on the nature and severity of their offense.

A descriptive rule is not necessarily a constraint on voluntary behavior, but an account of regularities in behavior irrespective of whether it is voluntary, habitual, or entirely determined by forces that are beyond the subject's control. Natural laws are invariably descriptive. Planetary motion is not regular because the burdensome laws of Kepler prevent planets from behaving as they would otherwise choose. Natural laws, therefore, consist of descriptive rules that are invariably empirical. That is, they are derived by inference from observation.

The social and economic rules that constitute human societies may be of two kinds. There are empirical rules that describe how people behave (descriptive). These are derived by observation of, but not necessarily known to, or expressed by, the subjects. There are also normative rules that represent rule makers' conscious model of how a society's members ought to conduct themselves (prescriptive). Study of empirical rules often teaches us that the normative rules are more honored in the breach than the observance, in which case we usually

reconstruct empirical rules to describe the patterns of exceptions to the normative rules that may be permitted (Edgerton 1985).

In examining markets, and deriving the rules vectors that constitute market behavior we are interested primarily in the empirical, descriptive rules. In addition, the normative, prescriptive rules are of interest insofar as they actually constrain or enable choice behavior and so coincide with a descriptive rule of that behavior. Such cases would indicate the presence of an exchange structure but may not satisfy our criteria for a market structure. Finally, our criterion of sustainability requires that we also examine normative, facilitating rules that enable market structures to function efficiently, in an economic sense, and fairly, in a sense understood by the participants.

The complete series of rules for each market or exchange structure is termed the rules vector for that structure. Appendix A contains the generic rules vector that we applied to each exchange structure. It consists of three types of rules: demand rules, supply rules and transaction-options rules.

The demand rules regulate the types of traders that can legitimately signal their intentions to obtain the good or service. Demand rules describe who may demand the good or service and how it will be consumed, e.g., whether or not it will be shared within a consuming unit. Another demand rule specifies whether or not the purchase represents a significant portion of the consumer's income, i.e., indivisibility in consumption, since this will indicate sampling or market-entry problems. Finally, we consider whether or not demand is for survival or status because this will affect the urgency of the demand.

The supply rules not only focus on who may supply the good or service, but also how the technology and inputs of production might imply particular supply conditions. Who may supply may be limited by either command rules, e.g., formal licensing, or traditional rules, e.g., where only the son of a blacksmith may become a blacksmith. The inputs may affect the temporal or geographical conditions of supply, in other words, they may place limitations on when or where supply may be available. The production technology or physical characteristics of the good may affect the storage potential of the product. Descriptive supply rules may imply limitations on how supply can be organized. For example, a natural constraint on the only source of a good or a crucial input to its production provides a condition favoring a monopolist in supply. Additionally, there may be technological reasons such that production is less costly at large levels of output, i.e., there may be economies of scale. Economies of scale are similar to indivisibility in consumption in that the presence of either condition implies a barrier to entry in the market by certain suppliers or consumers. In the presence of economies of scale, producers must be of a sufficient size to produce the good or service competitively. In the presence of indivisibility in consumption, buyers must have a sufficient level of resources to purchase the good or service.

Two other supply conditions that may affect the rules governing the organization of supply are the major uncertainties facing suppliers and whether or not supply is homogeneous or differentiated. In the first case, supply uncertainties can act much in the same way as natural or technical constraints on supply. This is especially true where there is significant informational uncertainty making risk an important cost of supply. In the case of product differentiation, greater distinctions among products that fulfill similar demands may encourage greater rivalry as firms attempt to increase their individual market shares.

Many of the rules and conditions revealed in the demand and supply analysis underlie specific rules that govern transaction options. Transaction options are those choices over property rights, selling, purchasing, pricing, monitoring, enforcement, and information that are permissible in the recognized transactions for the good or service.

Rules that designate property rights include specification of who holds the title to the property, who holds the entitlement to use and manage the property, who receives the costs and benefits associated with the use of the property. Exclusivity exists where all costs and benefits of owning and using the property accrue to the owner. Transferability exists where all property rights are transferable in a voluntary exchange. Finally, enforceability exists where property rights are secure from involuntary seizure or encroachment by others.

The selling and purchasing rules include specification of how, where, and when these activities may take place. For example, traditional business hours are, in effect, rules affecting when a consumer may make an offer to buy from the supplier. Rules regarding pricing can stipulate that prices are posted, i.e. fixed at least for the transaction, established through an auction or negotiation process decided prior to the consumption of a good, or decided after consumption. Additionally, rules may exist that limit the medium of exchange to be used to complete a transaction. This is particularly true for certain prestige goods that can only be traded for other prestige items.

Finally, transaction options may be limited by how transactions are legitimated and enforced. For example, regulation, laws, and customs may limit the legitimacy of exchanges that traders might otherwise desire to transact. Another limitation on the transaction options arises from how information is distributed in the exchange structure. For example, transaction costs will be generally higher for traders where buyers and sellers do not have access to the same information regarding the good or service. Finally, there may be externalities present in the production or consumption of the good or service. These externalities may instigate additional rules to allocate the costs and/or benefits of the externalities to particular economic agents. For example, regulation may be enforced to limit the amount of supply that can be produced by a seller who uses a technology that causes pollution.

3.6 SOURCES OF EVIDENCE FOR THE RULES VECTORS AND EXCHANGE STRUCTURES

Specification of the rules for non-market and market exchange is based on existing evidence from three fields of study. These fields include the literatures relating to the formal markets in economic theory, informal economic activity in sociology, and primitive markets and trading in undeveloped settings from anthropology where maintenance of civil order and the enforcement of contracts is, or was, uncertain or based on very different arrangements from those prevailing in the U.S. today.

Economic theory has focused on the activities that transpire in formal market structures. Here, the term, formal market, is used to denote the commercial exchange structures found in the U.S. economy, where buyers and sellers exchange goods and services for money. At the most basic level of inquiry, it is recognized that formal markets perform certain functions that facilitate their continuity or allow the operation of other markets. For example, formal markets serve to disseminate information to economic agents, signal opportunities to buyers and sellers, reduce transaction costs for intertemporal or interregional exchanges, and exploit comparative advantage, specialization, and the division of labor. Of particular interest in the study of formal markets is the analysis of market power, uncertainty, and externalities, i.e., those forces that would prevent a market from satisfying the conditions of pure competition.

At a more disaggregated level, formal-market analysis examines questions regarding the conditions of exchange between economic agents. For example, frameworks that are concerned with decentralized exchange, medium of exchange, and contracting between agents have obvious implications for post-disaster recovery. Among the useful insights emerging from the formal-market frameworks are the concepts of auctioneers, middlemen, entrepreneurs, coalition formation, and bidding behavior. Further, these frameworks highlight the importance of coordinating wants in the presence of barter exchange, the efficacy of money when goods are complex and/or involve large coalitions of traders, and the gains expected from the introduction of money. Lastly, formal-market analyses identify various problems involved in the negotiation, maintenance, and enforcement of contracts where asymmetric information and market power pose impediments to trade.

In speculating on a sudden cataclysmic destruction or impairment of existing societal institutions, insight may be gained from examining how groups transacting in the informal sector of the economy have overcome problems similar to the hypothesized economic-recovery problems. Of particular interest is how these groups have developed community-based, informal institutions to substitute for the institutions found in the formal sector.

A number of neighborhoods populated by individuals excluded from formal markets have developed trading and exchange systems for goods and services employing a variety of skills (Whyte 1955, Liebow 1968, Dow 1977). While some of these exchange are criminal, many are not. They involve household production (Burns 1977, Pahl and Wallace 1984),

employment of neighbors and friends, and the use of unlicensed craftsmen and unregistered business, forming an irregular or informal economy on the fringes of the formal-market sector (Ferman and Berndt 1981).

Informal economies develop a strong knowledge base that forms neighborhood learning webs and informal exchanges of skills (Ferman 1968, Ward 1981). Studies of low-income neighborhoods also show that such trading networks serve to integrate the community and provide a social fabric of mutual aid and support (Lowenthal 1975). Other studies show that it is not only the poor that trade in informal-exchange structures. Many employed professionals and craftsmen engage in informal work (Pahl 1984). Finally, disillusionment with the established helping services and decline in the traditional systems of social support, such as the family, has led to an expansion of non-market exchange structures that promote self-help and mutual-aid among group members (Katz and Bender 1976, Robinson and Henry 1977).

Evidence from the trading relationships exhibited by primitive economies can be superimposed on contemporary informal-economy studies in order to suggest the rules likely to exist where both institutions and resources are heavily damaged. The primitive-economy relationships often depend on the protection of traders by powerful patrons or blood brothers (Eisenstadt and Roniger 1984). Studies of primitive rationing suggest that it does not depend on centralized authority (Douglas 1958). Studies of the symbolic aspects of exchange and their relationship to the development of mechanisms of prestige and power, and the formation of political alliances (Pospisl 1963, Strathern 1971), may be important in any context where existing authority structures are destroyed or severely impaired.

The economic-theory, informal-economies, and primitive-trading fields of study not only suggest alternative exchange rules that should be considered but also define three interdependent spheres of non-command exchange structures: traditional, informal, and formal. Figure 1 shows these spheres and the specific exchange structures that are discussed by each field of study and used for the analysis of each recovery scenario. However, given our focus on market activities, we collapse the three spheres into two categories of exchange structures: non-market and market.

3.7 CONCLUSION

We have developed an analytical framework to explore the economic-recovery question under different survival scenarios. A positive feature of this framework is that it is not restricted to transactions that are strictly market oriented, rather, it is derived from the more general conditions of exchange activities. As a result, the framework extends beyond the notion that exchange is conducted solely for financial gain under the conditions of balanced reciprocity and considers incentives such as social bonding, status, and prestige. We can use the framework to ask about the relationship between the general exchange conditions and the market process for a particular set of transactions.

The use of the rules vector to characterize exchange structures facilitates this kind of analysis because it disaggregates an exchange institution into its rule components and thus, allows a comparison to be made across institutional types. The rules-vector approach also allows us to think about how particular rules may be changed within the institution rather than the complete substitution of one institution for another. Additionally, we may reflect on the applicability of particular rules vectors in the presence of the different levels of survival for institutions and resources by examining the compatibility of particular rules with these survival levels. Once identified, feasible rules vectors will constitute some of the possible ways in which the necessary and facilitating functions could be fulfilled under the different scenario descriptions discussed in chapters six through nine.

TRADITIONAL SPHERE	INFORMAL SPHERE
Subsistence	Intimate
Prestige	Associational
Peasant marketplace	Criminal

FORMAL SPHERE

Perfect competition
Imperfect competition
Oligopoly/oligopsony
Monopoly/monopsony
Bilateral monopoly

Figure 1. Non-command exchange structures in different spheres of exchange