

CHAPTER 2

THE TOOLS FOR THE ECONOMIC ANALYSIS

In the previous chapter I classified a system of money of account as an economic institution. It is a statement that will be clarified later in this chapter.¹ Taking this for granted for the time being, it follows that the history of a system of money of account, like the topic of this study, should be considered as a special case of the way in which economic institutions develop in general. This chapter aims to supply the tools of economic analysis that will be used to make the history of the money of account system in medieval Frisia intelligible. However, this is not an easy task because the tools we need are not waiting in a tool kit of economic science, ready for use. A theory of economic dynamics comparable to general equilibrium theory we do not have, wrote North, describing the situation that still obtained in 1994.² Moreover, most mainstream economists are not much concerned with economic institutions. Institutional economics is only a side stream of economic science, and the bed of this side stream appears not yet to be fully settled. So, to fulfil the aim of this chapter, I must try to select what I think are the most useful elements to be found in economic theoretical literature and try to put these elements together into a coherent framework. I may stress that, in the context of this study, I could not aim to review even the most important scholarly contributions to this subject. I have presented only those ideas that have influenced my own way of understanding the historical data that I found. The elements used do not belong to a particular school of thought in Economics, although it might appear that the New Austrian School had a preponderant influence.³ The composition of those elements did result in a tentative framework that appears to be helpful in explaining the evolution of economic institutions in general. Next, I have amplified this general framework with economic theories on the evolution of money in general and, finally, I have elaborated upon it to explain the evolution of money as measure of value in circumstances that occurred specifically in medieval Frisia.

¹ In the third section of this chapter, dealing with economic theories on the evolution of money.

² North, "Economic Performance", 359.

³ The New Austrian School, briefly, tackles problems of Economics by taking individual economic problems as the starting point; this approach is called methodological individualism. It shares this approach with the Old Austrian School, but it deviates from the Old Austrians by denying the existence of an inherent tendency in the economy towards an ultimate state of economic equilibrium, *ceteris paribus*.

Economic theory and economic institutions

In this section I shall try to demonstrate very briefly the phenomenon of economic institutions in relation to the core of economic theory. It is on this foundation that an economic theory of the evolution of economic institutions has to be built.

It is the task of economic science to explain economic phenomena. Taken loosely, when we consider economic phenomena we think of prices, income, export, money and so on. Economic phenomena have in common the fact of their having been brought about by human economic behaviour. Economists define economic behaviour not as a particular set of human acts but as only one aspect of human behaviour in general. They call it economic behaviour if it involves decisions that solve 'economic problems'. Economic problems are the very core of economic science. Essentially, economic problems are created by the necessity to allocate scarce means with alternative applicabilities to various ends of differing importance.⁴ They imply a range of possible solutions which must be traded-off to select the best. Every individual consumer's household, or production household, or public household, is regularly confronted with economic problems: how to spend time; how to spend income; how to invest capital; how to allocate productive resources; how to spend the budget, and so on. Economic problems are an aspect of daily life, in the present as well as in the past, all over the world.

Although individual economic problems are the core of Economics, economists are particularly interested in the way individuals solve their problems in relation to other individuals. In fact, this is the way most economic problems are handled in the real world. By the exchange of means, all participants involved increase their opportunities and hence may improve their results. It is one of the most efficient ways of solving one's economic problems. It is the way to enhance opportunities by division of labour and specialisation. Since the first human economic interactions, confined to mutual gifts and barter, this efficiency has improved enormously. Today, almost all individuals in the world are more or less interdependent participants in a global economy. It is in this context that economic institutions and their evolution have to be considered.

Although exchange may have enormous potential for enlarging the individual economic results of the participants, it is by no means an obvious or easy way to go. If exchange had to be operated by barter only, it would require considerable effort to arrive at a transaction with a partner who is interested in your offer and offers the right return from his side, on acceptable terms, in the right place and at the right time. If this were the only way to achieve a desired transaction, the costs and uncertainties would outweigh its advantages. Better ways had to be found. How man gradually succeeded in co-ordinating supply and demand with less effort, often even on a world-wide scale, has

⁴ Robbins, *An Essay*, 12.

been one of the main topics of economic science since Adam Smith (1723-1790). He stated in 1776, referring to the way transactions are co-ordinated in markets, that each individual “intends only his own gain; and he is in this, as in many other cases, led by an invisible hand to promote an end which was no part of his intention.”⁵ However, this study is not concerned with the history of this well-known topic. For our purposes, the vision of Menger (1840-1921), who was one of the first thinkers to focus attention upon the role of economic institutions in the co-ordination of markets, is more relevant. But before considering that, I must explain more extensively what economic institutions are about.

If economic problems solved by exchange are recurrent - and mostly they are - the individuals concerned will look for recurrent exchange, in other words, trade. Therefore, it is in the interest of all participants to find trading methods that obviate the necessity to hunt high and low. To that end, the costs and uncertainties of the transactions must be substantially reduced. To achieve a reduction in the costs and uncertainties of transactions, some co-ordination of the individual trading activities is necessary. The more reliable the information is as to what can be expected in the market, the lower the transaction costs and uncertainties of trade will be, the significance of such expectations being that they presuppose regularities in the behaviour of participants in a market. Hence, it is in the interest of all participants to behave more-or-less in a way that is predictable. Here a tension exists. Individuals are interested in the reduction of costs and uncertainties, of course, but at the same time they want to be flexible with regard to the terms under which they are prepared to trade. So, any trading practice must be strictly limited to what is generally felt to be compatible with flexibility. Only a limited degree of regularity will do. In a given field of trade, this regularity requires tacit rules for interactive economic behaviour that are mutually adopted. Every participant must act in conformity with what others do and expect him to do. It implies, for instance, the following of rules which dictate that meeting shall occur at particular places, at particular times, for the exchange of particular goods, to meet particular needs, in accordance with particular trade codes and so on. Nevertheless, mutually adopted rules are possible only if beneficial to all the participants concerned. Both parties in a given exchange must be better off as a result than they would have been if they had not followed the rules. But of course, as soon as rules are widely adopted by masses of participants, an individual will usually have no other choice either than to adapt to and comply with the rules or refrain from trade.

The rules we are referring to do not generally stand alone. Many rules regarding a particular aspect of trade are interrelated. They help to form ‘systems of rules’. In the last chapter, a social institution was defined as a regularity in social behaviour that is

⁵ Smith, *An Inquiry*, 199 (Book IV, Chap.II)

adopted by all members of society, specifies behaviour in specific recurrent situations and is either self-policed or policed by some external authority. Social institutions also embrace economic institutions. Clearly then, a system of interrelated rules for economic interactive behaviour, as dealt with in this section, is an economic institution. It is an economic institution with the function of co-ordinating market behaviour.⁶

To resume, it holds for each individual that following a rule of interactive behaviour is inherently a matter of self-interest, and to this extent we are still in accordance with the view of Adam Smith (quoted above). But by replacing Smith's concept of the 'invisible hand' by the concept of economic institutions that guide individuals and, consequently, co-ordinate market behaviour, we have arrived at Karl Menger.

It was Menger who saw that the problem of market co-ordination by following rules - that is by institutional behaviour - had come about spontaneously. After giving some examples of the emergence of institutions, he states: "In the same way it might be pointed out that other social institutions, language, law, morals, but especially numerous institutions of economy, have come into being without any express agreement, without legislative compulsion, even without any consideration of public interest, merely through the impulse of individual interests and as a result of the activation of these interests."⁷ And further: "This is a process, which in contrast to the genesis of social phenomena by way of positive legislation, can still be designated as 'organic'. ... Accordingly ... [these social structures] are the unintended result of individually teleological factors."⁸ At this point we can make the next step.

Evolution of economic institutions

Ultimately, these individually teleological factors are causative factors in the emergence and development of social institutions. With reference to economic institutions, these factors must be sought in individual economic problems, as we have seen. In the previous section, economic problems were defined as being created by the necessity to allocate scarce means with alternative applicabilities to various ends of differing importance. It follows that economic behaviour is determined by the ends, the means and the way of achieving those ends by those means; that is the approach of the economic problem. Just as this holds for the economic behaviour of individuals in general, so it holds also for their interactive economic behaviour.⁹ In the case of interactive behaviour, the economic problems of the individuals involved are determined not only by

⁶ There are also economic institutions with other economic functions, such as co-operation between individuals and tacit or contractual marketing agreements between competing firms, but for our purposes these other kinds of economic institution are not relevant.

⁷ Menger, *Investigations*, 157. Since 1930, Hayek has kept alive our attention to economic institutions, for instance in Hayek, *Die Irrtümer*, passim.

⁸ *Ibidem*, 158.

data concerning their own households but also by data concerning the households of other participants in the trade. Data, as economists use this term, concern information about the means and ends which is relevant for dealing with a specific economic problem. If each individual knew everything about everyone else's ends and means (as far as it was relevant for his own purposes), interactive behaviour would require no particular effort. But in reality it must be assumed that individuals have only a fragmentary knowledge of these external data. They can improve their knowledge only by investing means to acquire the necessary information. Hence, an additional economic problem arises: how to attune one's own behaviour to the external data as profitably as possible. Taking these individual problems together, there is a social need for co-ordination of interactive behaviour. Institutionalisation of behaviour might be the social response to this kind of problem, but we must not assume that this results automatically. It requires an additional mechanism. In trying to explain the history of economic institutions, we must discover the relationships between these institutions, on the one side, and the data underlying the economic problems of their users, together with the mechanisms of social response to the necessity of co-ordination, on the other.

Although, so far, no general theory of the emergence and development of economic institutions is available, economic literature does offer several fundamental ideas on various aspects of this theme.

First, let us look at the relevant economic problems generated by the opportunities for trade. An economic problem in this respect, and one that is currently receiving much attention, is that individuals who are concerned with trade try to reduce the costs of the transactions that are to be performed. Transaction costs, loosely defined, are the costs of facilitating trade transactions - for example, the cost of acquiring information. It goes without saying, for instance, that individuals who are interested in trade reduce their transaction efforts substantially when they agree to meet each other at a certain place, at a certain time, with certain goods, and so on, instead of gathering information by travelling around in search of a desired trade. That is, they must attune their individual behaviour to a mutual operation. In other words, they need co-ordination. Although North, in his theory of institutions, focuses on economic institutions that are aimed at co-operation rather than co-ordination, his next statement is also noteworthy in our context: "The costliness of information is the key to the costs of transacting".¹⁰ It is a key that will be used many times in the following pages.

⁹ This way of looking at 'the individual' as the ultimate source of economic phenomena is not commonly shared. It divides 'old' and 'new' institutionalists (Vromen, *Economic Evolution*, 2-3). Hodgson, "Institutionalism", 397-402, briefly reviews the institutionalist lines of thought.

¹⁰ North, *Institutions*, 27.

Another economic problem that requires attention in this context is that individuals aim to take into account the uncertainties of the future. Knight implied the concept of uncertainty in the study of economic problems as follows: “It is correct to treat all instances of economic uncertainty as cases of choice between a smaller reward more confidently and a larger one less confidently anticipated.”¹¹ When individuals engage in exchange, not incidentally but recurrently, the implication is that they must rely on doing future business. Therefore, they need information concerning not only the present state of the market but also the future state. But if information about future events and circumstances is not available, there is uncertainty. At best there are more-or-less probable expectations that can be quantified, and used in calculations, as costs. Knight does not call these cases uncertainties; he calls them ‘risks’. For true uncertainties, probabilistic expectations are impossible.¹² The future is unknowable. Hence, no one can rely on the future conduct of the other participants in trade with certainty, so provisions are needed to prevent future transactions being merely hazardous. For instance, provision for the consequences of the perils of transportation, or the unpredictability of future exchange rates, has to be made. To stay with Knight’s formulation of this economic problem, the participants need to find ways of co-ordinating their mutual conduct in order to gain more confidence in future trade.

Having mentioned the kinds of economic problems of trade that are relevant for the emergence and development of economic institutions - reduction of transaction costs and coping with uncertainties of trade - we must now have a brief look at the data that determine these problems. It is the changes in these data that cause the changes in economic institutions. It is this aspect of the theory that is required for an analysis of the history of economic institutions. North has given his view on this issue: “Institutions change, and fundamental changes in relative prices are the most important source of that change. ... [They] alter the incentives of individuals in human interaction, and the only other source of such change is a change in tastes.” When he refers to fundamental changes of relative prices, he has in mind changes in factor prices, changes in the cost of information, changes in technology and so on. Unfortunately, the nature of changes in relative prices and the nature of changes in taste are quite different. North admits that the exact mix of changes in prices and changes in ideas is still far from clear.¹³ Instead of change in relative prices, North apparently thinks of fundamental shifts in the data of supply and demand as underlying the changes in prices.¹⁴ By changes in tastes he means changes in ideas, dogmas, fads and ideologies,¹⁵ which are, in fact, also determinants

¹¹ Knight, *Risk*, 237.

¹² *Ibidem*, 19-20.

¹³ North, *Institutions*, 85.

¹⁴ This appears from the examples he gives, such as the changes in land/labour ratios that resulted from the plague in late medieval Europe (North, *Institutions*, 84), or the changes in costs that result from improving knowledge (*ibidem*, 84; 79).

¹⁵ *Ibidem*, 84-86.

that underlie the changes in prices. Therefore, we must keep these underlying data in mind when constructing the tools of analysis that we need: human preferences, the stocks of productive resources and the technologies, in the widest sense, that are needed to apply these resources. It is the lasting major shifts in these preferences, resources and technologies that cause the changes in economic institutions. But which changes are major and lasting? Only seldom is this knowable beforehand. There may be a considerable time lag between the beginnings of such shifts and their eventual effects on economic institutions by social response. Consequently, as North puts it, the resulting institutional changes are “overwhelmingly incremental.” But sometimes “wars, revolutions, conquest, and natural disasters are sources of discontinuous institutional change.”¹⁶ In other words, institutional change is mostly spontaneously effected, but it is sometimes politically or naturally enforced.

We have seen that the co-ordination of mutual behaviour in trade is indispensable in the solution of economic problems: how to reduce transaction costs and how to cope with uncertainties in trade. Furthermore, we have explained what kinds of data determine these problems and hence condition their solution. Co-ordination by way of institutional behaviour, such as Menger had in mind, may seem an obvious consequence, but it is by no means an automatic consequence. So the question remains: by what social mechanisms do institutions actually emerge and develop? What are the social forces that bring about the spontaneous evolution of institutions? To answer this question, I think, it should be recognised that different individuals have different ways of approaching their economic problems. Without uncertainties, individuals may solve their economic problems by behaviour resulting only from mathematical maximisation.¹⁷ But in the real world, information is not perfect, and the future is always uncertain. Instead of mathematical maximisation there is a whole spectrum of possible attitudes by which an individual may approach his economic problems. At one end we find individuals who engage in entrepreneurial discovery to try out new solutions and to learn from their experiences, whereas at the other we find the individuals whose attitude is to follow established customs.¹⁸ In between are those who follow the successful entrepreneurs.

¹⁶ *Ibidem*, 89.

¹⁷ This indeed is what neo-classical economists assume to be standard economic behaviour. They do so, not because they assume that this is a realistic mode of behaviour in any individual case, but because they hold that it is the effect of impersonal market forces (Vromen, *Economic Evolution*, 38-40, reviewing the contemplation of Alchian, Friedman and Becker). According to this view, a trade transaction, and thus mutual behaviour, is the result of calculation by both parties involved, in which uncertain data are estimated, more-or-less sophistically. In a world with perfect or stochastic knowledge, only equilibrium tendencies would exist and the co-ordination of interactive behaviour would be an automatic result. There would be no need for reducing transaction costs or coping with uncertainties. The automatism is brought about by a fictitious auctioneer who brings all data regarding supply and demand together - including actuarial expectations and stochastic knowledge - to calculate instantaneously the equilibrium prices at which the goods at the market are reallocated among the participants.

¹⁸ O’Driscoll, *The Economics*, 2-6.

Across the whole range, nevertheless, each individual aims for the best possible solution to his own problems. But there are differences in capability between individuals, and hence there are differences in what is subjectively thought to be the best strategy. Taking into account the existence of such an array of attitudes among trade participants, it is inevitable that, at some time, a few pioneering, entrepreneurial individuals¹⁹ with a creative vision will agree upon a novel, mutual, recurrent form of conduct that will reduce their individual transaction costs or trade uncertainties.²⁰ The act of trying out new combinations is typical entrepreneurial behaviour according to Schumpeter's famous characterisation.²¹ Obviously, the example, if it is apparently beneficial, will gradually be imitated by other, perhaps less visionary but in any case less enterprising, individuals. So a new rule of conduct is created, and once established rules may be improved.²² Additions to and replacement of an existing rule emerge in the same way, incrementally and slowly, because initially all changes are experiments. The masses are watching and, moreover, they may resist to a certain degree. Changing a rule, once ingrained in the habits of large groups, is costly in itself. A new rule will be established only if its advantages are apparently set off successfully against the efforts demanded by the change. The evolution of an institution, quite naturally, is wearisome. The social response to the change of data will lead to a change in an economic institution only if the users of that institution experience the advantages as being superior to the disadvantages. We may conclude that the emergence and development of institutions is the result of the social interplay of human creativity on the one hand and human inertia on the other. These are the causative social forces that become effective when fundamentally changing economic problems have created a need for new, additional or modified co-ordination.²³

The process of cause and effect bringing about changes of economic institutions that I have just analysed is often identified as 'evolutionary' because it possesses features

¹⁹ The concept of the entrepreneur used here is that of Schumpeter, *Theorie*, 111. In other words, it is anyone who realises new combinations of productive resources, and hence it includes not only independent businessmen on their own account but also functionaries of corporations, or government organisations, or lords of a manor, or chieftains of tribes, and so on.

²⁰ In case of co-ordination problems a 'source of suggestion' might be something found obvious in the nature of the problem itself, by applying 'rule of thumb', or by historical experience (Van der Lecq, "Conventions", 408-410).

²¹ Schumpeter, *Theorie*, 99-139. Trying to add, amend or remove an institutional rule is not explicitly included in the five cases of 'new combinations' enumerated by Schumpeter, but it is in accordance with his way of viewing entrepreneurial creativity and, moreover, it is very similar to his fifth case: 'realisation of a new organisation' (*ibidem*, 100-101).

²² North, *Institutions*, 73-82, focuses specifically on organisations and their entrepreneurs, created to take advantage of the opportunities offered by institutions and, by doing so, to feed back incremental alterations to the institutions.

²³ Veblen, *The Theory*, 190-191: '... men's present habits of thought tend to persist indefinitely, except as circumstances enforce a change. These institutions which have so been handed down ... are themselves a conservative factor. This is the factor of social inertia, psychological inertia, conservatism.'

which are regarded as characteristic of cultural evolution in general.²⁴ Veblen, looking at human culture as a scheme of institutions, views institutional change in its cultural setting. “The growth of culture is a cumulative sequence of habituation, and the ways and means of it are the habitual response of human nature to exigencies that vary incontinently, cumulatively, but with something of a consistent sequence in the cumulative variations that so go forward.”²⁵ Hayek - who, by the way, eschews the use of formulations for cultural evolution that stress analogy to natural evolution²⁶ - mentions three characteristic mechanisms:²⁷

- (a) The rules of an institution are *replicated* by being passed from individual to individual and from the past to the future - by ‘imitation’.
- (b) The *mutation* of an institution, induced either by human preference or external data, is undertaken by the ‘innovative creation’ of a potential new rule that might become an addition to, or an alteration of, or an alternative for an existing rule.
- (c) The potential new rules are *selected*; that is, they are accepted in the society by way of trial and error - in other words, by ‘adaptive learning’.

In addition to these three evolutionary features, mentioned by Hayek, there is also a significant fourth one which is contrary to Hayek’s view.²⁸ This feature concerns the outcome of the process of institutional development:²⁹

- (d) Institutions develop ‘path-dependently’; they are not ‘completely and continuously malleable for reshaping response to the profit-seeking motives of economic agents’, as many neo-classical economists seem to believe.³⁰ As formulated by North: “Path dependence [occurs when] the consequence of small events and chance circumstances can determine solutions that, once they prevail, lead to a particular path.”³¹

The concept of ‘path dependence’ probably deserves some more clarification here in anticipation of the discussion in the sequel.³² It refers to the historical course of the

²⁴ In biological evolution it is the phylum that evolves; in cultural evolution it is the social institution. Vromen, *Economic Evolution*, 107: “... three mechanisms have been distinguished in biological evolutionary theory: the selection, replication and mutation mechanism.”

²⁵ Veblen, *The Place*, 241.

²⁶ Hodgson, *Economics and Evolution*, 152-185.

²⁷ Although the mechanisms of cultural evolution (a), (b) and (c) are essentially Hayek’s, they are not found in this precise form. I have relied on the interpretation of Hayek’s view of evolution (in the extensive list of his publications) by Vromen, *Economic Evolution*, 107-129. In handling Hayek’s body of thoughts in this way, I may quote Hodgson, *Economics and Evolution*. 159: “Given the significance of an idea of the ‘evolution’ of social institutions in Hayek’s mature work, it is odd that it receives so little elaboration.”

²⁸ Vromen, *Economic Evolution*, 211: “What is dubious in Hayek’s view is his assumption that all individuals have the same interest in co-ordinating their plans in one unique and optimal equilibrium.”

²⁹ It is Vromen, *Economic Evolution*, 212-213, who argues that the following feature is an outcome of evolution and therefore has not the same status as the three foregoing principles of evolutionary mechanisms.

³⁰ David, *Why are Institutions the ‘Carriers of History’?*, 205-208.

³¹ North, *Institutions*, 92-104.

³² It will be discussed in the last section of this chapter.

evolution of any institution. The choice of the rule at the beginning of the path, which may have satisfied the needs of its time, may lead to an irreversible course of development that locks out better opportunities that might have been attained if the course had been different. Path dependency is a recognised aspect of technological development. The famous example of path dependency is the organisation of the letters on the typewriter keyboard, QWERTY., which has become so standardised and fixed that it will persist even in the face of more efficient alternatives.³³ My experience of studying the evolution of money of account in medieval Frisia has convinced me that the occurrence of path dependency cannot be ignored. I therefore share the view of North, who states more specifically: “Once a development path is set on a particular course, the network externalities, the learning process of organisations, and the historically derived subjective modelling of the issues reinforce the course”.³⁴ There is no reason to suppose that such a path would be the most efficient thinkable - that is, the socially optimal institution which would be the best for the growth of wealth - if, within that society, all relevant circumstances had been known from the very start. North felt challenged to explain the persistency of differences in wealth among various economies in the world. The explanation may be found, he believes, in path dependent differences in the development of economic institutions, rooted in historical constraints. “Path dependence means that history matters”.³⁵

Economic theories of the evolution of money

This section deals very briefly with economic theories regarding the evolution of money as an economic institution. It should be taken for granted that, in this section, both functions of money - as means of payment and as measure of value - are discerned but not dealt with separately. In the rest of this study, the evolution of money as a means of payment is assumed as a datum because, as stated in the introductory chapter, my focus is on the question of why a particular money unit is selected as a measure of value and how a system of account based on that selected money unit is shaped. It is true that money as means of payment is an important datum for this subject, so it pays here to look at that aspect too.

In 1871, Menger, as we have seen, opened the eyes of economists to the evolution of institutions in general and to the evolution of money as a means of payment in particular.³⁶ He imagined the latter as starting from a state of nature. The realisation of multilateral exchanges of goods, satisfying all individuals involved in a market, would have been extremely difficult if some of the individuals involved had not noticed that goods have different degrees of saleability (we would say ‘liquidity’) and that the least effort

³³ David, *Clio*, 335-337.

³⁴ North, *Institutions*, 99.

³⁵ *Ibidem*, 100.

³⁶ Menger, *Grundsätze*, 247-256.

to realise exchanges was made by those individuals offering the most saleable goods. This observation would have initiated an 'invention': the exchanges could be made easier - in one's selfish interest - if they were made indirectly; that is, by accepting in exchange for one's own goods, goods which were more saleable, with the purpose of exchanging these more saleable goods for the goods that one really wanted. This 'invention' would have been imitated by other individuals and, in time, have become a custom of the particular society involved. An institution had emerged. And clearly, this emergence was motivated by the welcome reduction of efforts to realise exchanges or, as we would say, by 'reduction of transaction costs'. So, according to Menger's theory, the principal incentive for the individuals to find and sustain an institutionalised money system of exchange is the motive to reduce the transaction costs. By satisfying this motive the institution indeed enables its users to increase the convenience of payments. Therefore the means of payment should be commonly desired, divisible and 'representative' (that is, their quality and quantity should be easily determinable). But, in addition to this motive, Menger mentioned a second motive: the desire to store means of payment in order to secure future needs and opportunities. Hence the means of payment should not only be saleable (liquid); they should also be valuable, transportable and durable.³⁷

Hayek, in 1977, followed Menger's theme.³⁸ In his view, competition between various money systems will result in the selection of the 'best' money.³⁹ It is a logical consequence of his general view that competition between institutions leads to the survival of the most successful institution. In this contest between moneys, Hayek has paid attention not only to money as a means of payment but also to money as a measure of value. Money, he argues, has four applications. 1. In its function as a means of payment it may serve present purchases. For present purchases, the wider its currency, the better. 2. By being stored, it may also serve future purchases. For future purchases, the more its value increases, the better. 3. As a measure of value money must quote present values. For present values, the more widely it is used for pricing, the better. 4. In this function, it must also quote future values. For future calculations, the more stable it is, the better.⁴⁰ If these applications are taken into account, what will be the decisive money function when various money systems compete for public preference? Although convenience of payment is significant, Hayek believes that its being a sound measure of value (unit of account) would be decisive.⁴¹ If not - that is, if current experience of prices

³⁷ A formal explanation of the existence of money in terms of the neo-classical marginalistic approach is found in Brunner, "A Survey", 7-19.

³⁸ Hayek, *Entnationalisierung*, 53-65.

³⁹ *Ibidem*, 1-4: Instead of a common currency, Hayek proposed free competition between the currencies of the countries of the European Community, by making each currency legal payment in each country.

⁴⁰ *Ibidem*, 55-58. In this piece of text, the arguments Hayek uses are not as neatly divided over the four kinds of applications as his division and my summary suggest.

⁴¹ *Ibidem*, 55.

make future prices too uncertain - people might choose a measure of value (unit of account) that is not used as a means of payment at all.⁴²

A few years before Hayek - in 1971 - Brunner had already published a micro-analysis of money based on the neo-classical approach. His analysis starts from a world with perfect knowledge and zero transaction costs. Once this full information world is abandoned, the optimising behaviour generates transaction-dominating assets, and the individuals find it beneficial to use media of exchange. He concludes that “this analysis does not imply that individual transaction patterns converge to a single medium of exchange, a single asset used as money. It explains the occurrence of several types of money.”⁴³ It should be noted that this analysis is confined to money as medium of exchange,⁴⁴ so the conclusion does not exclude a convergence to a single asset used as measure of value. At about the same time, in 1976, Jones presented a probabilistic model of the evolution of a means of payment in which he derives stable solutions for an economy in which full monetisation and full barter, as well as intermediate amounts of monetisation or trade, evolve.⁴⁵ This model did not render a single, determinate equilibrium outcome (Hayek’s ‘best money’). Hence, the evolution of the monetary unit is a case of path dependency. Schotter, in 1981, presented a game theoretical analysis of the evolution of money. The game format provides a useful tool for analysing interactions. Game theorists distinguish various types of interactive problem.⁴⁶ Money solves an interactive co-ordination problem. Schotter concludes that various solutions would execute equilibrium trade in each period of the game. The corollary is that the set of institutions existing at any point in time is really an accident of history and that what exists today could have evolved in a very different manner.⁴⁷ This conclusion, too, underpins the logic of the evolutionary character of money as an economic institution because, in essence, it reflects path-dependence. Nevertheless, “there is a vast gap between the relatively clean, precise, and simple world of game theory and the complex, imprecise and fumbling way by which human beings have gone about structuring human interaction”, as North states.⁴⁸

Reviewing these monetary theories, I shall try to integrate their contributions in the framework proposed in the previous section. In that framework, we found that the need to co-ordinate interactive behaviour in trade in order to reduce transaction costs and to

⁴² *Ibidem*, 62.

⁴³ Brunner, “A Survey”, 5-25.

⁴⁴ The publication of this article (1971) precedes that of Goodhart (1989) in which a small distinction is made between media of exchange and means of payment (see Chapter 1, ‘Money as means of payment and money as measure of value’). This difference, however, does not affect my remark.

⁴⁵ Jones. “The Origin”, 757-776.

⁴⁶ Schotter, *The economic theory*, 35-38.

⁴⁷ *Ibidem*, 79.

⁴⁸ North, *Institution*, 15.

cope with uncertainties of trade is the underlying cause of the emergence and development of economic institutions. As the theories just mentioned make clear, money may be considered as a specimen of these economic institutions. But we are not occupied here with money in general. We must distinguish money as a means of payment from money as a measure of value in order to proceed to our purpose - an outline of a theory on the evolution of systems of money of account.

As far as money as a means of payment is concerned, a reduction in transaction costs will be attained by methods of increasing payment convenience, so the wider its present acceptance, the better. By dealing with the problem of coping satisfactorily with future uncertainty, the necessity of reserving means of payment for future payments comes into the picture. Hence, for money that may serve to cope with uncertainty of future liquidity, it holds that the higher its future acceptance the better. This formulation is close to Menger's, but has moved away from Hayek's modern concept.

As far as money as a measure of value is concerned, a greater reduction of transaction costs is attained the more widely the money is used for pricing - in other words, the more widely one can communicate in trade using this measure. A wider communication creates more opportunities and therefore a chance for better solutions to the individual's economic problems.⁴⁹ Coping satisfactorily with the future uncertainty of trade requires a stable measure of value - in other words, a measure of which the value in terms of other goods fluctuates the least, if at all.⁵⁰ This can be clarified. The value of any commodity in terms of an equivalent quantity of other goods is always susceptible to changes through time. Future uncertainty is the most precarious aspect of a barter economy because there are numerous reasons why a once-satisfactory deal between two individuals might not be repeated in the future. There is less chance of worry if a particular commodity serves as measure of value because other trade partners come more easily into view. One can watch prices and react. However, the value of such a measure is also susceptible to changes through time. Oxen used as measure of value may suddenly rise in value in relation to other goods if a cattle-plague kills large numbers of them in a short time. Gold or silver may decline in value in relation to other goods if new gold or silver mines are discovered and exploited. As we also experience in our times, fiduciary money is susceptible to changes in value because of modern inflationary or deflationary tendencies. No money seems to escape this vice, but people presuppose some moneys to be more vulnerable than others.

⁴⁹ In our days it is one of the official rationales for the euro.

⁵⁰ Niehans, *The Theory of Money*, 123: "The important point is that for given fluctuations in relative prices the overall variability of money prices depends on the choice of the medium of account. To the extent accounting costs depend on price variability, the minimisation of accounting costs thus provides a criterion for the choice of the medium of account".

The result of this review may be put in a matrix, showing the particular facilities that money provides for the co-ordination of trade:

| <u>money function</u> | <u>reduction of transaction costs</u> | <u>coping with future uncertainties of trade</u> |
|-----------------------|---|--|
| means of payment | facilitates the convenience of making payments | facilitates the storing of liquidity for future payments |
| measure of value | facilitates the convenience of communication in trade | facilitates the reduction of future price uncertainties |

Economic theory of the evolution of money as measure of value (under conditions such as those in medieval Frisia)

In the previous sections, a tentative, rudimentary framework for a theory of the evolution of economic institutions with regard to the co-ordination of trade has been presented, together with elements of the monetary theory to be placed within that framework. We have now arrived at the point where we can construct the tools of economic analysis that must serve to enable us to understand the evolution of a system of money of account. The matrix at the end of the previous section offers the starting point as it tells us in what ways a measure of value helps to solve interactive economic problems. From this starting point, the tools of our analysis will be constructed in three stages. A special section of this chapter is devoted to each of these stages. First, the institutional rules that are the building stones of a system of money of account - this system being the institutional shape of a measure of value - will be explained. Next, the changes in the data of the economic problems underlying the interactive economic behaviour in trade that may provoke a change of such a money of account system will be analysed. The third stage will be devoted to the social response to these data changes that can result in a change of the system of account itself. In this stage the evolutionary features of the response - imitation, creative innovation, adaptive learning and path dependency - will come to the fore.

The rules of a system of money of account

If money is being used as measure of value, it is an economic institution, as has been demonstrated. The institution may be denoted as 'a system of money of account' or a 'money of account system'. As the money of account systems studied here are limited to medieval Frisia, I shall limit the properties of this institution to what I have found in that particular time and place.

Now, what does an institution called a money of account system imply in fact? Like any institution, it is a set of rules. As I have found empirically, only four rules constituted the medieval Frisian money of account systems:

1. The rule which implied what standard coin would be mutually recognised as the basis for the unit of account (for instance, the coin named ‘old *vleemse grote*’).
2. The rule which implied the mutually recognised face value⁵¹ of that coin at a given time (for instance, 1.4g silver equivalence).
3. The rule which implied the relationship between this standard coin and the unit of account (for instance, 1 unit of account = 1/12th old *vleemse grote*).
4. The rule which implied the relationship between this unit of account and the multiple units in the money of account system (for instance, 1 mark = 12 shillings = 144 pennies = 144 units of account).

Since we are dealing with the evolution of this institution, it follows that all four rules are subject to change. In the following chapters, which concern a real history of money of account, this will be made visible by the use of tables recording the monetary changes found in each chapter. Their format will be made clear by the following example (in which, during the period 1394 to c.1430, the silver equivalence of the standard coin, the old *vleemse grote*, which was worth 12 units of account, decreased from c.1.4g to c.1.2g, and the money of account system consisted of a.o. 1 mark = 12 shillings = 12 x 12 = 144 pennies = 144 units of account):

A survey of the evolution of the system of money of account

| Period | Standard coin | Equivalence | Unit of acc./multiple units |
|-----------------|--------------------------|---------------------------------------|--|
| 1394/ c.1430 | old <i>vleemse grote</i> | c.1.4g of silver/ c.1.2g of silver | 1 d. æ 1/12th standard 1 sh = 12 d. 1 mk = 12 sh |

Data changes

In dealing with the causes that may change an economic institution, we have seen that we must look at the data underlying changes in relative prices: lasting major shifts in preferences,⁵² resources⁵³ and technologies.⁵⁴ The resulting changes mostly emerge spon-

⁵¹ The face value of a silver (or gold) coin is the quantity of silver (or gold) for which that coin is accepted as equivalent in a given place at a given time. In short: its current silver (or gold) equivalence.

⁵² I did not find changes in systems of money of account that might clearly be ascribed to fundamental changes of taste. This does not alter the fact that the attribution of stability to some moneys can be seen as a kind of taste that strengthens social inertia against change. Such kinds of influence on systems of money of account are now being experienced as national feelings opposing the introduction of the euro.

taneously from the society itself, but they may also result from political enforcement. So, to understand these causes of change, we must penetrate the data behind the prices. Even when they are limited to medieval Frisia, their range is wide. I have therefore arranged the data that I found into three more-or-less independent societal spheres - the coin sphere, the economic sphere and the political sphere of the society in question.

The coin sphere (the currency)

The coin sphere concerns the stock of means of payment used in the society under consideration. It is the stock from which the standard coin of a money of account system is usually selected. I say 'usually' because, in principle, the money of account may differ from the money used by a society as a means of payment. The way in which the stock of the means of payment (in brief, the currency) is generated and evolves in a society is of great importance to the understanding of its system of money of account. From my study of medieval Frisia, I have found empirically that, without political interference, the currency is determined by several mechanisms:

- the coin trade,
- mint enterprising,
- deterioration,
- 'Gresham's law',
- the monetisation of bullion.

In principle these mechanisms work independently, but it is their combined effect that determines demand for and supply of coins, resulting in a relative price expressing the face value of the coins. As the standard coin of a system of money of account is selected from the types of coin in the coin stock, these mechanisms determine the system of money of account if, and as far as, they arouse social response. Provided these forces work without governmental interference, the result is a 'market-controlled' currency. With a few exceptions, this condition was fulfilled in medieval Frisia. Interestingly, the combined effect of the mechanisms just enumerated, working in a market-controlled currency, has an endogenous dynamic aspect. Consequently, the face value of coins - including that of the standard coin - shows a secular tendency. But before dealing with that tendency I must elucidate the mechanisms separately.

- The mechanism of the coin trade.

The economy of medieval Frisia was completely open. Coins from abroad could flow in and coins produced in the country could flow out, without any hindrance. They were valued according to free market principles. So the prices of coins in commerce were market rates. But free trade in foreign coins also opened the way to the influx of inferior

⁵³ For instance, the considerable reduction in population resulting from the plague epidemic in the middle of the 14th century caused a relative shortage of labour and hence a growing economic influence of the little man, who cared less about the importance of money for future pricing.

⁵⁴ For instance, the growth of urban crafts caused a need for small money.

foreign coins, sometimes deliberately debased during a monetary conflict between princes, but also often counterfeits. The addition of these coins to the money supply caused a decline in the average intrinsic value of the currency.

- The mechanism of mint enterprising.

Under medieval Frisian circumstances, a mint operated like any other business under free market conditions. The entrepreneurial behaviour of the mints determined the supply of home-made coins. A coin was a product intended for the market. Coins were offered by the mints to meet public demand. The moneyers offered their product with an assumed metal content, sometimes in various denominations and various designs. A certain quantity of these coins was the price they paid for the bullion or other coins brought in by the customer. Because minting takes time, the moneyers will usually have supplied from stock. So they had to predict their demand. Moneyers must have been continuously pressed to minimise the minting costs. In order to obtain a reasonable reward, they tried to strike as many coins from a given weight of silver or gold as was customary or legally tolerable. Because a very rigid quality control would be too costly, a limited variety in weight and alloy between the specimens was generally tolerated. Within certain limits of variation in intrinsic value, coins were accepted by the public at what was considered to be the normal average intrinsic value of the time. This was what we call the 'face value' of the coin. Obviously, moneyers tried to produce their coins at an intrinsic value as close as possible to the lower limit of the tolerance.⁵⁵ Apart from the regular mint enterprises, there have always been coiners able to add deceptive coins to the currency with some degree of success. Consequently, the average intrinsic value of new coins added to the existing circulation tended to press down the current average. In other words, it tended to be a little below the current face value.

- The mechanism of deterioration.⁵⁶

The average weight of a stock of coins of a given type decreases over the course of time as a result of wear and tear during normal use in circulation as well as by clipping and other illegal ways of withdrawing gold or silver from the pieces. Research has shown that, in the late Middle Ages, the normal loss of silver equivalence in coins by wear and tear was a very small and usually fairly constant⁵⁷ quantity per annum. This quantity depends upon various factors such as the velocity of circulation, the diameter of the coin, the kind of metal, and so on. In the early and high Middle Ages the velocity of circulation of money was so modest that consequent wear was hardly noticeable at all.⁵⁸ According to a formula proposed by Van Hengel, the average loss in the 14th

⁵⁵ Pol, "Muntgewichten", 25.

⁵⁶ This subject is dealt with in detail by Van Hengel, "Wear", 139-145; Mayhew, "Numismatic evidence", 3; Aerts, "Metal loss", 41-58.

⁵⁷ The term 'identical' instead of 'constant' is proposed by Aerts, "Metal loss", 43 (note 6).

⁵⁸ Information kindly provided by Dr P. Ilisch, custodian of the coin collection of the Westfälisches Landesmuseum für Kunst und Kulturgeschichte in Münster.

century and thereafter was c.0.0045g per annum for silver coins with a diameter of 19mm and over,⁵⁹ and from empirical research it appears that this formula would still hold approximately if the average velocity of circulation in Europe was roughly constant from the 14th century onwards. The results of his examinations prove to be even better if the velocity during the 14th century was lower than it was during the 19th and 20th centuries.⁶⁰ We must assume the decline of silver content by wear and tear before the 14th century to have been much less, probably almost zero, although it was increasing with the growing velocity of circulation due to progressive use of money in the economies. This decline in the silver content of the coin was equal to the decline in the silver equivalence of the unit of account (= penny of account) when the standard coin was a penny - for instance, the sterling penny. But of course, as soon as a larger coin was used as the standard coin - representing n units of account - the 'normal' decline of the silver equivalence of the unit of account would be only 1/n of the 'normal' loss in silver content of that standard coin.

- The mechanism of 'Gresham's law'.

This law is usually formulated as 'bad money always drives out good money', which must be understood to mean 'overvalued money always drives out undervalued money'.⁶¹ Money is undervalued if its face value - that is, its legal or conventional value - has developed below its intrinsic metallic value. The mechanism works by the activity of people, presumably people familiar with the coin market, who are able to pick out the undervalued coins and collect them together for melting or for export.

- The mechanism of monetisation of bullion.

In Frisia, the public was free to bring bullion to the mint and order new coins in exchange for it. They did so as long as the terms of the mint seemed favourable. Under this condition - freedom of the public to sell bullion to the mint - the gradual decline in the value of coins, mentioned in the previous section, could not be restored. In bringing bullion to the mint in exchange for coinage, one would suffer an immediate loss if requiring the initial, or at least a higher, gold or silver content for a given type of coin than was the average in the market because, in trade, the new coins - notwithstanding their better quality - would be accepted only at the already-conventional lower face value. Hence there was no advantage to be gained from doing this.

⁵⁹ Van Hengel, "Wear", 144: "... in other words: every coin with a diameter of more than 19 mm loses 4.5 milligrams p.a. through normal circulation; for coins of smaller size the loss would be reduced by a factor of $d^2/19^2$ where d is the diameter in mm." (Mr Van Hengel kindly informed me that his article had mistakenly mentioned a loss of 0.45 mg per annum.)

⁶⁰ *Ibidem*, 144.

⁶¹ See Polak, *Historiografie*, 255, on various interpretations of this law.

I shall now turn to the combined effect of these mechanisms on the face value of coins under the condition of a market-controlled currency. All the mechanisms just mentioned have the direction of their results in common: the lowering of the face value of the coins. As we have seen, the production of coins of a given type with varying intrinsic value was practically inevitable and hence tolerated, so the moneyers tried to produce coins as close as possible to the tolerated lower limit. Hence, the freshly supplied coins already tended to push the average intrinsic value of the currency below its conventional face value. Counterfeit coins increased this tendency, and it was substantially enhanced by coin deterioration. In particular, the clipping of the better coins to the lower limit of their acceptance must have been commonplace. Slower, but still persistent, was deterioration by wear and tear. Furthermore, the import of inferior foreign coins of the same types that were used in the home currency contributed to the process. The latter factor was particularly significant in medieval Frisia during periods when the currency was mainly based on coins of foreign design. The public also tried to make their payments with coins at the lower limit of acceptance because, as a result of Gresham's law, coins of a given type with a silver weight apparently better than the average of the time were picked out of circulation to be sold abroad or melted down as bullion for replacement by lighter coins with the current face value. The larger the variety in the weight of a given type of coin in the currency, the stronger the effect on its face value. It was only weakened by the costs of melting and reminting, and bullion was only monetised if the coins returned would meet the current, lower face value. All these forces resulted in the lowering of the actual average intrinsic value of the coins in the currency. So the process went on and on; in fact, it never stopped.

Of course this tendency also applied to the coins used as the standard for the money of account. The prices were based on their face value. Obviously, the prices of goods and services and even legal tariffs (albeit mostly delayed) were adapted periodically to the declining silver content of the standard coins. For instance, a standard coin of good quality with an intrinsic value of 1.3g of silver would be ousted if almost all other coins of the same type that were in circulation contained only 1.2g of silver with the result that the pricing system, in fact, was already based on coins with a conventional value of 1.2g of silver. Only the less valuable specimens remained in circulation. So, as a result of the combined effect of the various mechanisms determining supply and demand of the currency, the face value of coins tended slowly, hardly noticeably within one human generation but nevertheless continuously, towards the lowest limit of acceptance of the pieces in circulation. As a result, there was always a secular tendency towards decline of the face value of coins and, *mutatis mutandis*, of standard coins. As a result, the gradual decline of the average intrinsic value of the standard coins, and hence of their face value, caused a gradual rise in prices, *ceteris paribus*. This creeping inflation in the value of coins because of the declining intrinsic value of the standard coins may be

regarded as normal in the Middle Ages.⁶² It will be referred to in this study as ‘normal decrease’ in the unit of account. This tendency can be viewed as a dynamic force coming from the coin sphere, affecting the evolution of a money of account system. It can be typified as a ‘built-in destabiliser’ of such a system. However, it should be stressed that this steady destabiliser has an unsteady effect. It may cause a growing increase in prices because a decrease in silver content of 0.1g per period of a coin of 1.3g results in a loss of only 8.3% silver, but if the coin was 0.2g before the resulting loss would be 50%. In other words, in the long run, a constant normal decrease may result in a growing loss of purchasing power; that is, a growing increase in prices. We will meet this phenomenon clearly in Chapter 5.

Although normal decrease in the unit of account seems to be a drawback inherent to a system of account based on a market-controlled currency, this is a prejudice. Governmental interference could delay, but could not stop, this process. Spufford puts it this way: “Even the best intentioned prince had to make some concession to this fact, otherwise he would find that nobody would bring bullion to his mints, and that people would at once hoard or export any coins that he did succeed in issuing.”⁶³ What was the combined effect of these mechanisms on the face value of coins where the condition of a market-controlled currency did not exist - in other words, where governmental authorities interfered with the currency? Governmental measures with no other effect than facilitating the normal use of the currency - such as warranting the quality of the coins or protecting the mint and its customers - are not classed as governmental interference in this study. In these cases the seignorage to be paid to the authorities may be viewed as part of the normal cost of production of coins. Governmental interference, in this study, refers to measures with political aims. Of course, regardless of these measures, the mechanisms just mentioned still operated, but governmental control could bend the course of development of the intrinsic value of the coins to a considerable extent. Governmental interference involved control of the mints and control of the coin trade. Interference in mint enterprising took the form of prescribing the gross weight and the fineness of the coins that the mintmaster was permitted to strike. But only when these conditions met the conditions existing in the coin market could the mints produce coins profitably. If not, they had to be closed. This occurred often. For this reason, the authorities tried to control the coin market by ordaining coins to be admitted in circulation and by prescribing the rates of these coins. The degree of success was mostly dependent upon the balance of power between the governmental authorities and the merchants.

The political aims could result in re-establishment, as well as in debasement, of the intrinsic value of coins. In the first case, the extant currency was declared illegal and

⁶² Spufford, *Monetary problems*, 11; Munro, *Wool*, 33.

⁶³ *Ibidem*. See also Munro, *Wool*, 32-34.

coercively withdrawn from circulation, to be reminted at the cost of the owners of the coins. This method could render an extra profit of seignorage. This method could also be used in the second case if the debasement was public, usually motivated by national interest. But many rulers also applied secret debasements by supplying coins with an intrinsic value below the legal value of the extant currency, using the profit on the silver to finance wars, diplomacy or other areas of expenditure. Clearly, the effect of these policies on the face value of the coins in general, and on the standard coins in particular, could deeply influence the evolution of the unit of account in the countries concerned.

The economic sphere

The system of money of account is a part of the monetary system, and the monetary system is a part of the economy of a country. The whole affects the parts, and the parts affect the whole, in a mutual interaction. As this study is confined to discovering and explaining the evolution of a money of account system, we are interested in only one half of this interaction: the influences of the economy on the monetary system. Mostly these influences are indirect and diffuse. A few instances of direct influence need to be mentioned:

- the velocity of circulation of money
- the degree of division of labour in the society
- the relative size of the foreign trade
- the prices of foreign currency (the exchange market)
- the price of gold in terms of silver (the silver:gold ratio).

I will give only a very brief description of their role in the theoretical framework since the way these influences operate seems rather straightforward.

- The velocity of circulation of money.

The larger this velocity, the larger the coin deterioration and the faster the normal decrease in the silver equivalence of the unit of account.

- The degree of division of labour in the society.

The higher this degree, the larger the degree of indirect production (*in casu* the larger the proportion of production for small needs that will shift from direct production in agrarian households to indirect production by urban handicrafts and services) and hence the greater the frequency of payments of small amounts. This may affect the system of money of account in cases where the existing system renders the value calculations of small amounts inconvenient. In such cases, the system does not adequately satisfy the need for convenient communication. But the opposite is also valid. The higher the degree of division of labour in the society, the higher the real social income, the larger the frequency of high incomes and the more frequent the use of large sums. The convenience of calculation in large amounts may also require an adaptation of the system of

account. The existence of both forces may even lead to the evolution of two systems working alongside each other at the same time.

- The relative size of the foreign trade.

The higher the foreign trade relative to the internal trade, the higher the significance of foreign pricing, the greater the influence of costs of foreign transactions on the economy and the stronger the inducement to reduce these costs, for instance by tuning the systems of money of account involved. The relative size of foreign trade was perhaps the most important datum of the Frisian system of money of account. It dominated the evolution of the system for some time. Its influence on the money in use in Frisia declined when the foreign trade stagnated.

- The exchange market.

In addition to the influence of foreign trade, the influence of the exchange market on the system of money of account was also substantial. The level of the exchange rates must have been an important source of information on the value of the money of account of Frisia itself. Those watching the exchange market may have been pioneers in the adaptation of the face value of the standard coin of the Frisian money of account system. The system of money of account was also influenced by the import of foreign coins that could be added to the circulation at home. This has been mentioned already in the previous section.

- The silver:gold ratio.

This ratio is of particular interest where gold and silver coins circulate alongside each other and might compete for use as standard of the money of account. It is said that a double standard is in force if a legally or conventionally fixed rate of exchange between the silver and the gold based units of account exists, whereas a parallel standard defines the situation in which such a fixed rate does not exist. Both situations are found in medieval Frisia. The double standard was useful only as long as the legal or conventional rate matched the commercial silver:gold ratio. If it did not, coins of the legally or conventionally undervalued metal were driven out according to Gresham's law. This means that, in the system of a double standard, the latter ratio was ultimately decisive as to whether the silver based or the gold based unit of account was actually in use.

The political sphere

The political sphere is relevant to the subject in so far as the authorities try to intervene in the natural evolution of the system of money of account. This could happen in two ways:

- by stating what coin would be the legal standard for the unit of account;
- by stating what value was to be assigned to the legal unit of account.

A national government has never existed in Frisia, so there has been no national intervention in the system of money of account. Whether the ‘supra-national’ government in Carolingian times tried to rule the measure of value (and whether it succeeded) is not clear, as we shall see. In all other cases there was at best a local government, sometimes expanding over other localities. Only in a very few cases have these local governments tried to regulate the unit of account. But in Frisia the public did not follow blindly, as, for instance, will be demonstrated in 15th century Groningen, where the commercial and the legal units of account evolved differently.⁶⁴

The social response

A change of data will result in a change of an economic institution only if social response permits it to. In other words, a change will occur only if the forces inspired by entrepreneurial creativity to establish, alter, or replace an institutional rule prove, after some time, to be stronger than the forces of resistance from the social inertia of the masses; that is, if the tentative institutional adaptation promises sufficient economic gains to set off the economic losses and to break a tenacious habit. To complete our tools of analysis for the evolution of a system of money of account, we must define these two forces: entrepreneurial creativity and social inertia.

Entrepreneurial creativity

Entrepreneurial creativity generates change. As we have seen, creativity in the evolution of a system of money of account is motivated by attaining convenience of communication in trade (transaction cost problem) and/or by reducing uncertainty as to future prices (uncertainties of trade problem). Now, ‘entrepreneurial creativity’ is not a very active cause of change in a money of account system. It operates only when the existing system shows shortcomings.

In the Middle Ages, the need to improve the convenience of communication in trade is partly reflected in the desire to use a standard coin that is widely accepted as a measure of value. The more it is used, the fewer are the amounts, based on this standard, that have to be converted into another measure of value. It reduces the transaction costs; that is, the costs of communication with other trading partners. A system of money of account should also be easy to handle. Consequently its properties are more-or-less fit for communication. We will see that a system’s capability for being used for calculations was apparently an important property for its penetration and dispersal. In most cases, this facility is more easily fulfilled by using current coins than by using non-current coins.

⁶⁴ See Chapter 12, ‘History of the measure of value’: although an antiquated foreign coin named *butdrager* was the legal standard in Groningen, after 1454, the public preferred the current home-made *stadvlieger* as the standard coin.

The need to reduce the uncertainties of future prices is partly reflected in the desire to use a standard coin that is assumed to have a stable future purchasing power; that is, future value in terms of goods. The coin should be trustworthy. Naturally this is related to the trustworthiness of the producer of the coins. Since no one has perfect foresight, a coin not being produced any more is more trustworthy than a coin still in production because the intrinsic value of its last issue is an unchangeable fact of history.

These solutions are conflicting, and so they have to be traded-off. There are various possibilities. The options are:

- a current coin still in production;
- a current coin not being produced any more (*e.g.* an antiquated coin);
- a coin that is not current but is still in production (*e.g.* a foreign coin);
- a coin that is not current and not being produced any more.

The best way to reconcile both solutions appears to be the selection of current coins that are not in production any more. However, in practice, this option cannot last for long because coins not being produced any more will become scarce in the circulation, and a tension will develop between the original intrinsic value of the coin and its actual intrinsic value as a result of coin deterioration. This tension will generate misunderstandings, which are inconvenient. Because of this, the standard coin may not fulfil its requirements any more and will be ousted by a new one. So there is no optimal solution for all cases.

As this study will show, all options for selecting a standard coin have been found in medieval Frisia. All possessed advantages and disadvantages. What was preferred at a given time and place may have been influenced by recent experience or by experience abroad - adaptive learning. In the following history we can only guess the reasons why, in a given situation, a particular solution came to dominate. In this study, when the selection of a standard is being examined an attempt is made to explain the selection by taking the context into account. If we understand why a particular solution was tried out, we may also understand why it was or was not followed by the masses - its competitive success.

So much for creativity in the selection of a standard coin. But creativity was also at work when a system based on a given standard was being changed. Thus, when an existing system did not satisfy its users, a pioneer might create a slight change in the existing rule and propose it to his trade partner. When this slight change proved satisfactory, it gradually came to be imitated by others until it was generally adopted. By then the institution had changed. An example may serve to illustrate this process. The model of a survey of the evolution of money of account, given before⁶⁵, refers to a case

⁶⁵ In the section on the rules of a system of money of account.

where the average silver content of coins in circulation has decreased from 1.4g to 1.2g. This case might have come about when a pioneering merchant refused to accept the hitherto conventional face value of that coin at 1.4g of silver and declared his prices based on a coin of 1.2g. His incentive might have been that he was not sure that other prices - relevant for his business in the near future - would continue to be based on the hitherto conventional face value. His pioneering example, then, would gradually have been recognised and imitated by other users of the system.

Social inertia

Inertia resists change. It is the mechanism that may respond to a transaction cost problem since change will disturb communication in trade. It is also a mechanism that may respond to a problem concerning uncertainties of trade, as change may disturb existing future price agreements. 'Follow the rule' shows itself to be a very powerful datum that is continuously 'at work'.

In the Middle Ages inertia in the system of money of account was even stronger than political forces. Only over long periods did the working of counterbalancing forces become noticeable. Every change of a money of account system requires substantial efforts. The existing system, surviving from the past, tends to be preferred since it has the advantage of being already ingrained in the customs of the people. Consequently, efforts towards change are only effective if they are incremental. Moreover, they can be no more than an addition to, an alteration of or an alternative to an existing rule of the system as it was hitherto. It changes in much the same way as a language changes. The path of evolution is continuous and the evolution is step-by-step. The evolution is, as we say, 'path-dependent'.

The path of evolution of a system of money of account starts with the choice of a standard coin, the basis of a measure of value. Given a dynamic context for a system of money of account, it follows that a standard coin is selected by interactive behaviour as the assumed 'best' choice given constraints on information about the alternative options and their likely outcomes. However, after some time it may lose its initial superiority. Other options may emerge and compete. Because of distrust in its future value or because of apparent inconvenience in communication for trade, a standard coin may gradually be ousted if a better alternative is at hand, but leaving the old path implies the cost of acquiring new experience. The results of this study of Frisia will demonstrate that the force of the old habit was very tenacious. Path dependency is a feature of the evolution of institutions in general. It also applies to a money of account system.

Inertia in the evolution of a system of money of account has yet another feature. Sticking to the old path also means that special adaptations may be required to cope with new challenges. In many cases, the habits of foreign trade partners provided a chal-

lenge. This occurred, for instance, when popular coins were being imported. As Spufford found, the habit of counting coins in dozens and in dozens of dozens was so ingrained that, when a new coin did not coincide neatly with a multiple of the pre-existing coins, a new system of marks, shillings and pence was automatically constructed on the basis of the new coin.⁶⁶ This might result in a new system of account. However, not every new coin with a denomination that did not suit the existing system of account successfully generated a lasting new money of account system. The new systems were tried out, but if a new system of account failed its useful aspect could nevertheless be inserted into the old system.⁶⁷ This kind of adaptation led to the emergence of new multiple units of account in the old system. In fact this development was the result of a social process in which the benefits of improved communication were traded-off against the costs of switching the standard. In this study I will call the result ‘adaptive compromise’.

Summary

I shall take the findings of this chapter together. It relates the evolution of a system of money of account to the economic problems of the people using that system in so far as conditions exist as they did in medieval Frisia. To deal as well as possible with economic problems, people need regular interhuman exchange; that is, trade. To co-ordinate trade, people need economic institutions. A system of money of account is an economic institution which facilitates communication of current prices and reduces uncertainty as to future prices. Such a system is determined by data in the coin sphere, in the economic sphere and in the political sphere, and by the social response to these data - characterised by social inertia and entrepreneurial creativity. Once a standard for such a system, and its relation to the unit of account, has been determined, it evolves in accordance with changes in these data and the way these changes are met by society.

Generally, the standard will be a particular gold or silver coin. The evolutionary path begins with the selection of such a coin. Its use as a means of payment results in a normal decrease in its gold or silver content. This process - an inherent dynamic force coming from the coin sphere - determines the ‘normal decrease’ in the gold or silver equivalence of the unit of account. This normal decrease can be viewed as the main course of the evolution of the money of account system. Because of social inertia, if no other changes occurred, the evolutionary path would be a straight road as long as the standard coin was usable. But other changes in the coin sphere (that is, of a market-controlled currency), in the economic sphere (that is, roughly, in the conditions on the markets of goods and services), or in the political sphere (that is, by governmental interference) may occur and will challenge entrepreneurial creativity to try out novel-

⁶⁶ Spufford, *Handbook*, xxiii.

⁶⁷ The insertion would be effected as a change initiated by human creativity (‘a pioneer might create a slight change of the existing rule, and propose it to his trade partner’).

ties which will be set against resistance from social inertia. The outcome of this may show an evolutionary path repeatedly deviating from the straight road. So the path is mapped in a particular history, one example of which is medieval Frisia.

Final remark

The tools of analysis developed in the preceding sections will be applied in the following chapters. These chapters all have the same format. The first section, “The historical context”, deals with the main features of the political and economic spheres just mentioned. The second section, “The history of the means of payment”, is devoted to the coin sphere. The third section, “The history of the measure of value”, presents our findings on the topic of the study itself - the institution to be analysed, and closes with a brief survey of the development of the system of money of account concerned according to the table-format demonstrated in the present chapter. The final section, “Economic analysis”, uses the tools just described to analyse the development formulated in the previous section.

