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An Economic Theory of the Growth of the Western World¹

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THE object of this article is to present a new explanation for the economic rise of the Western world. While the model presented below has equally radical implications for the study of contemporary economic growth, our focus is upon the economic history of the nations that comprise the North Atlantic nucleus between 1100 and 1800. In capsule form our explanation is that changes in relative product and factor prices, initially induced by Malthusian population pressure, and changes in the size of markets induced a set of fundamental institutional changes which channelled incentives towards productivity-raising types of economic activity. By the eighteenth century these institutional innovations and accompanying changes in property rights built productivity changes into the system enabling Western man to finally escape the Malthusian cycle. The so-called "Industrial Revolution" is simply a later surface manifestation of innovative activity reflecting this redirection of economic incentives.

In subsequent sections of this article we shall (1) summarize (mostly from price history and population studies) the general contours of economic changes in Western Europe from 1100 to 1800, (2) provide an economic explanation for these changes, (3) develop a theoretical approach to institutional change, (4) integrate the analysis of economic change with the model of institutional change, and (5) explore briefly the implications of this general model.

There exists only fragmentary information on the economic contours of society between 1100 and 1800. We know that sustained economic growth emerged some time before the latter date and has continued ever since, although we are unaware of just when it began. We also know that the world prior to, say, 1500—if not

¹ This essay is a drastic condensation of a forthcoming book by the authors and of necessity has eliminated extensive bibliographical references. We are indebted to Stanley Engerman and to our colleagues Mary Eysenbach, John Floyd, and M. D. Morris for helpful comments on an earlier draft.

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typical of what we would call a stationary state—still shows no evidence of having achieved continuously rising *per capita* income.

What follows is a brief summary of our knowledge—fragmentary, incomplete, and occasionally contradictory (particularly with respect to the demographic evidence). We should caution, to begin with, that regional variations marked Western Europe, so that the general contours of population change and price movements described above were not always parallel. Nevertheless, general patterns do emerge; and these appear to offer hard enough evidence to justify an attempt to construct a more general theoretical model with which to interpret this information.

Scholars generally agree that in the twelfth century Western Europe experienced notable expansion both of population and of settlers moving into still good arable land. *Per capita* income probably rose as output increased faster than population. Exactly when Europe became settled and diminishing returns to further increases in population set in is a matter of some controversy; but it appears likely that by the end of the twelfth century population pressure was a significant factor leading to changing relative prices with consequent rising rents and falling real wages. Also a matter of some dispute is the question of when population growth reversed itself, some scholars maintaining that the downward trend began as early as the first decade of the fourteenth century, whereas others hold to the classical explanation of the Black Death between 1347 and 1351 as the turning-point. The relative price data suggest that the former explanation is more credible: that is, real wages appear to be rising and the prices of agricultural products falling, beginning with the early fourteenth century. What is indisputable is that from the middle of the century on, population fell for a substantial period of time as recurrent plagues swept over Western Europe. In England the plague returned in 1360-1, 1369, and again in 1374, and regardless of the relative impact of each it is clear that collectively the plagues throughout the rest of the century were continually checking population growth and probably causing an actual decline over a substantial period. During this disturbed time land rents were falling, real wages were rising, and agricultural prices were relatively depressed.

Neither demographic data nor relative price data enable us to say exactly when population began again to expand. Since large amounts of good land were available to be put into production, population could grow for some time before relative price changes reflecting diminishing returns in agriculture would signal the onset of population pressure. Some time during the fifteenth century, therefore, a turning-point was reached, although the abundance of available land, and probably some increases in productivity, may for a time have maintained rising *per capita* real income in the face of a growing population; the evidence on this is not conclusive. The classic work of Hamilton has made clear, however, that a general rise in the price level did occur in the sixteenth century. This was accompanied by a significant relative price change, with agricultural prices rising much more rapidly than others, and by higher rents and lower real wages.

It would also appear that this was an era of population expansion accompanied by significantly diminishing returns in agriculture. John U. Nef has suggested that technological change in the latter part of this century brought about some advance in productivity. It is doubtful whether this was of a magnitude to over-

come diminishing returns in agriculture. The more likely inference is that increased productivity served merely to damp the Malthusian checks, allowing a larger total population to exist before the inevitable population pressures resulted, in the seventeenth century, in another crisis with population outstripping the rate of growth in output. If population did not absolutely decline in Western Europe during this century, it appears at best to have stagnated.

During this period there is clear indication that productivity change occurred in a number of sectors, the most apparent being substantial improvements of productivity in transportation. Not only was the Canal du Midi constructed in the seventeenth century; more impressively, unequivocal evidence points to an improvement of efficiency in ocean transportation leading to falling real costs in the movement of goods. The extensive grant of patent monopolies in England in both the sixteenth and the seventeenth centuries probably paid off in productivity increase due to a variety of innovations brought over from the Continent.

Another turning-point appears to have come somewhere in the latter part of the seventeenth century—perhaps 1680 is as good a date as any. Again, from 1680 to the mid-eighteenth century substantial population growth occurred on the Continent. Prices remained relatively stable, and there appears to have been some rising *per capita* real income during the period. By now, one sees indisputable evidence of widespread improvement in productivity, not only in the form of continuing gains in transportation (particularly in shipping) but also as a result of widespread changes in the character of agriculture. These have been highlighted in many regional studies in agriculture, pointing, in the cases of Provence and Languedoc, for example, to shifts into viticulture and silk cultivation. Regional price differentials for agricultural commodities were narrowing, indicating an expansion from local to regional, to national, and finally to international markets. The growth was destined to extend throughout the eighteenth century, and it is perfectly evident that the productivity increase and expansion which were to become watchwords of the Industrial Revolution were already in effect. In short, sustained growth had begun in Western Europe.

II

An explanation of this demographic, price, and productivity behaviour can be summarized as follows. Before the middle of the twelfth century growth in population led to new colonization and settlement, and output grew as rapidly and probably more rapidly than population, so that *per capita* income increased. The urge to colonize and settle new areas would develop when relative overpopulation and diminishing returns in an existing settlement led to a falling off in well-being. This process could be slowed down by farming the given settlement more intensively, but as population continued to grow it would ultimately induce people to move out into new "frontier" lands. The spread of population through Western Europe produced a powerful inducement to expand trade since different parts of Europe had different resource endowments and, with different densities of population, also different factor proportions. To take but two examples, viticulture was possible in many new areas and fine wine increasingly in demand throughout most of Europe. The result was an expansion of the wine trade. Manu-

MANUFACTURING—in particular of wool cloth—developed in the more densely settled areas and the cloth trade grew. Thus, interregional trade was a natural consequence of the differential factor endowments concomitant with the spread of settlement in Europe as a consequence of population growth.

However, as Europe became settled and population continued to increase, generally diminishing returns set in, real wages fell, and ultimately as the standard of life declined the population became increasingly susceptible to famine and disease. The result was the disastrous events of the fourteenth century with the bottom of the cycle reached some time in the fifteenth century and the whole pattern started all over again at that point. However, the second cycle is considerably dampened compared to the first, not only because settlement moves beyond the frontiers of Europe to the New World thereby easing the population pressure but also, more particularly, because an accelerating rate of increase in productivity now permits rapidly expanding output to ameliorate the diminishing returns in agriculture; the trough of the second cycle is consequently far less devastating. Indeed, by the time a third cycle of population expansion begins, productivity increase has become built into the system, and output continues to grow more rapidly than population.

The inception of this sustained increase in productivity can be accounted for only by a theory of institutional change, and this is to be developed in the following section of this essay; but the pattern of population change, relative price movements, and the growth of interregional trade can be explained in terms of a strictly economic model which we shall call a Malthusian staple-thesis model. While this model oversimplifies the evolution of Western Europe that we wish to describe, the addition of complicating factors (such as some rate of technological change) does not appear to affect adversely its explanatory power.

The model consists of two sectors, a non-agricultural sector subject to constant returns to scale and an agricultural sector subject to diminishing returns as population in any given area of settlement continues to grow. However, as long as there exists available empty land of equal quality, the build-up of population and consequent diminishing returns in the settled areas can be relieved by colonization and settlement of new land. The factor endowments of areas as population grows thus become increasingly differentiated. In old settled areas, labour and capital (both physical and human) are relatively abundant, leading to the expansion of the non-agricultural sector. In the newly settled areas, differential resource patterns (from varied climates, soils, etc.) produce varied agricultural and mining output and the gains from trade are increasingly enhanced. The consequent specialization and interregional trade will themselves result in productivity increase, but cannot account for the sustained growth of productivity needed to break out of the Malthusian trap when all the available land becomes settled and general diminishing returns set in. In order to break out of the Malthusian cycle, institutional changes must occur which by incentive direct man's efforts towards technological change and sustained productivity growth.

III¹

Economic institutions, and specifically property rights, are generally considered by economists as parameters; but for the study of long-term economic growth they are clearly variables, historically subject to fundamental change. The nature of existing economic institutions channels the behaviour of individuals within the system and, in the process, determines whether the aggregate result is to be economic growth, stagnation, or decay.

Before we proceed farther, a definition is needed. Common usage of the term "institution" defies precise meaning since it has variously referred to an organization (such as a bank), to the legal rules that govern the economic relations between people (private property), to a person or position (king or monarch), and sometimes to a particular document (the Magna Charta). For our purposes, we shall define an "institution" or an institutional arrangement (which is a more accurately descriptive term) as an arrangement between economic units that defines and specifies the ways by which these units can co-operate or compete.

As in the more familiar case of the introduction of a new product or process, economic institutions are innovated because it appears profitable for individuals or groups in society to undertake the costs of bringing about such changes. The purpose is to capture for the innovator some profit unattainable under the old arrangements. The essential requirement for initiating an institution (or a product) is that the discounted expected gains exceed the expected costs of the undertaking; only when this condition is met would we expect to find attempts being made to alter the existing structure of institutions and property rights within a society. We shall explore successively the nature of potential gains and potential costs in such innovation, and then discuss the economic forces that would alter the ratio of these costs and gains through time.

Potential profit from a number of general sources can be captured by institutional innovation, whether of a voluntary sort or undertaken by use of the coercive powers of government. To accomplish voluntary organizational change, a group of individuals may choose to place themselves under a common set of rules governing their behaviour. Since each member retains the right to withdraw, the organization will exist only so long as it serves the interests of the group. Partnerships, corporations, and co-operatives are examples of such organization. Differing fundamentally are organizations under government aegis, since in this case the force or coercion of government may be exerted to require specific performance and the individual may no longer withdraw from membership and the coercive consequences of the policies.

Potential benefits that historically have induced institutional innovations and thereby actually raised the productivity of society result from (1) economies of scale, and (2) reduction of transactions costs, which can best be viewed as the costs of operating an economic system. The latter in turn can be separated into

¹ The intellectual origins of the theory set out in this section can be traced to W. F. Baumol, *Welfare Economics and the Theory of the State* (Cambridge, Mass., 1952); Anthony Downs, *An Economic Theory of Democracy* (New York, 1957); J. Buchanan and G. Tullock, *The Calculus of Consent* (Ann Arbor, Michigan, 1962); Harold Demsetz, 'Towards a Theory of Property Rights', *American Economic Review* (Proceedings, May 1967); Kenneth Arrow, 'Political and Economic Evaluation of Social Effects and Externalities', Universities National Bureau Conference on the Economics of Public Output (unpublished, cited by permission of the author).

the costs of externalities, of information, and of risk. Both the realization of economies of scale and the reduction of transactions costs have been significant sources of profit to groups undertaking institutional rearrangement.

Economies of scale are essentially a technological phenomenon and reflect the fact that the most efficient (lowest cost per unit) output may entail a size that requires more complex organization than the single proprietor. The growth of chartered companies, joint-stock companies, the corporation, and the legal provision of limited liability provide classic examples of how institutions and property rights were created to permit individuals to capture the profits inherent in economies of scale. Such organizations were first sanctioned by government, then later became voluntary, within a set of property rights designed to allow businesses to organize on a large scale.

Among the transactions costs mentioned above, externalities have received the most attention. By an externality we mean that some of the benefits (or costs) in a transaction accrue to other than the directly participating parties. In modern times we think of the downstream benefits of a dam, or, historically, of pirates and privateers preying upon commerce, as familiar examples. An even more significant historical example is the inability of an entrepreneur to capture the gains from an innovation without the legal protection of intellectual property. In each case, the profits to the potential dam-builder, trading merchant, or innovating entrepreneur are lower than they could be by appropriate institutional rearrangement. A change in tax structure or property ownership could permit the dam-builder to capture downstream benefits. A naval force could wipe out pirates, thereby seeing that merchants rather than pirates reaped the gains from trade, and an enforceable patent law would see that an innovator captured the gains from his innovation. The internalization of an externality by reorganizing property rights, institutional innovation, or the policing of markets not only will raise the private profitability of the activity but, as in the case of economies of scale, will also improve the efficiency and output of the society by equating the private and social profitability of an activity.

A less explored aspect of transactions costs is that of organizing and improving the flow of relevant economic information, yet this has historically been a major area of institutional innovation.

If there were no costs to acquiring information then prices in all markets would differ only by transport costs. In fact, information is costly and the widespread existence of purely local markets reflected in good part simply the lack of information about profitable trading opportunities in more distant areas. The development of such information meant that merchants would send their products to the markets where net price differentials (i.e. prices adjusted for transport costs) were highest; thus the development of institutions to increase the flow of information increased the merchants' profits. The development of the whole network of trading institutions—merchants, brokers, factors, supercargoes, early exchanges in coffee houses, stock and commodity exchanges—were all directed basically to this end. Eventually, it became profitable to produce and sell this information in such forms as price currents or trade association journals. Like the two previous sources of institutional innovation, these were not only privately profitable to the merchant and entrepreneur but by arbitraging markets were a

major source of productivity increase and economic growth in the Western world.

The prevalence of risk—the inability to be certain of the terms on which future transactions can be made—is yet another cost limiting the extent of transactions. The possibility of very high losses on an individual transaction will inhibit such enterprises even though when averaged out over a sufficient number of undertakings the average rate of return may be very high indeed. The creation of institutions to spread risks would clearly make it possible for entrepreneurs to realize these higher rates of return without the risk of disastrous consequences when an individual venture failed. The early share-partnership in shipping and trade, the joint-stock company, and insurance associations (such as Lloyd's of London) were created precisely to capture the profits from such high-risk ventures. Since the high potential profits mirrored the social rate of return, the development of such institutions to spread risk also led to productivity increase. We should note in passing that many institutional innovations were created both to increase information and to spread risks (many types of financial institutions, futures markets, etc.).

12/02/08 The above types of innovation are associated with institutional change which also improves the efficiency of the economy. Yet, quite clearly, this is not the only kind of individually profitable institutional innovation that may occur. Institutional arrangements may also be created, either by voluntary groups or by the government, which are designed to capture gains for individual groups at the expense of others (or, in short, to redistribute income).¹ We may conceive of any group which is organized to control supply effectively as being able to redistribute income in its favour. The guild system may provide one example; or we can note various attempts through coercive power of government to undertake such activities: typical are the several attempts to fix wages following the era of the Black Death or, to take a different example, the Poll Tax of 1381 in England.

Institutional arrangements are not costless to create. The cost of forming both voluntary and governmental associations varies directly with the numbers involved; the greater the number that must be brought into agreement, the greater are the costs incurred.² Since voluntary organization presumably also implies the privilege of voluntary withdrawal, such organization must in effect exist under a unanimity rule.³

However, in considering organization by government one must look carefully at the potential costs. Until a more sophisticated theory of the state is developed by political scientists, we can only specify at discrete points in time the structure of political power and decision-making rather than provide a dynamic theory of political change. In a democracy the costs of effecting a particular policy will typically be those of obtaining the support of 51 per cent of the populace under majority rule. But when we go back in time to explore the issues that concern us in this essay, decision rules with respect to political change are more difficult to as-

¹ Institutional innovations designed to realize the gains inherent in economies of scale or to reduce transactions costs will probably also redistribute income within the economy, but this effect is a by-product of the primary objective. On the other hand, institutional innovations designed primarily to redistribute income will generally not raise society's output and will usually lower it.

² This very brief discussion of the costs of organization is amplified in Buchanan and Tullock, op. cit. ch. 8.

³ This means that the participant must view the cost of withdrawal as exceeding the cost of the policy with which he disagrees.

certain. This is not to deny that changes could be effected in political policy at some particular cost. The most obvious method that comes to mind is the bribing of kings and princes who were notoriously hungry for funds to run their governments. Historically, we observe many innovational changes accomplished by the use of discreet bribery, sometimes in the guise of loans. But for these earlier forms of political change we do not yet possess even the embryo of a general theory such as we are beginning to achieve for changes occurring under a political democracy.¹ Therefore, so far we must conclude that decision rules must have varied widely over time, and we are unable at this point to specify them accurately. We must simply assume the ability of groups in society through time to modify decision rules or to modify the political process.

We should note an additional cost incurred in the political process but absent in the voluntary system: once agreement has been reached to pass a law, all citizens become subject to that law whether they approve of it or not. These are the costs of coercive agreement. For example, when the peasants of feudal Europe entered into the manorial system—providing labour services in exchange for “protection and justice”—they were from that point on subject to the coercive authority of the lord and had not the right to dissolve the bond even though the initial benefits might have long ago ceased to exist. The familiar story of the protracted death of feudalism aptly illustrates the potential cost of a coercive agreement. The extension of the authority of government always has potential costs in terms of its coercive power being utilized in ways that may injure even those members of society who may originally have promoted the extension of government authority.

What will decide whether groups choose voluntary rather than governmental means of implementing institutional innovation? The answer must be the relative benefits and costs of the alternative methods, and our brief outline above suggests some of the benefits and costs that might exist. We may note that the social costs appear to be greater in general for governmental organization; but we should also realize that in many instances the benefits will be still greater. The most obvious reason for this is the coercive power which permits government to undertake policies even though they may be strongly objected to by a part of the society. Coercive power is exerted through the capacity to collect taxes, to enact regulatory legislation, and to institute eminent domain proceedings. The relative benefits and costs will be particularly influenced by the degree of development of government “infrastructure” as compared to the degree of development of the market. The era of “mercantilism” represents a period when the government structure was relatively well developed and the markets were small, fragmented, and often monopolized. Merchants and entrepreneurs turned to government to open up markets, to break down local monopolies, and to provide naval and military protection for trade; in short, to undertake the institutional innovations essential to internalizing externalities and reducing transactions costs.

So far our exploration of the basis for institutional innovation has not explained why such innovation tends to occur. But we must remember that presumably ex-

¹ Even for political democracies the theory is tentative and a long way from satisfactory; Buchanan and Tullock, *op. cit.* and Downs, *op. cit.* have made a beginning towards exploring aspects of this part of the problem.

ternalities or transactions costs exist at any given moment because no group in society judges it profitable to internalize the externality or to arbitrage out the market imperfections associated with other forms of transactions costs. Equilibrium among economic institutions exists when the costs of change (to the individual or group) exceed potential benefits. Therefore, to induce institutional innovation, some disequilibrium must occur in the system that adds weight to the profit side in the judgement of the decision-making individuals or groups, i.e. the perceived benefits must have risen, the costs fallen, or both.

Several factors appear to have created disequilibrium in the social structure of the Western world. The ones that we will subsequently focus on in this essay are: (1) long-run changes in relative product and factor prices, (2) changes in the size of the market, and (3) changes in the decision rules of government.¹

Long-run changes in relative factor and product prices have led to fundamental institutional changes. For instance, changes in the relative value of land and labour altered the profitability of "owning" one versus the other and destroyed the basic *raison d'être* of feudalism. Rising agricultural prices increased the value of land and made it profitable to develop exclusive ownership of land (i.e. develop private property in land). With growing population and a relatively fixed supply of land, labour services became decreasingly valuable, thus providing the basis for the development of a free labour force. When relative prices reversed, the pressures for institutional change worked in the opposite direction. Changes in relative prices also led to an expanded basis for interregional trade and caused other changes, to be elaborated in Section IV below (pp. 10-16).

The increasing size of the market has historically weighed heavily as a force for institutional innovation. Transactions costs tend to be subject to economies of scale. The cost of getting additional information about prices may be independent of the size of the market involved, and a larger potential market makes it worth while to acquire information which would have been unprofitable in a very small market. This would appear to be true with respect both to improving information and to reducing externalities in such cases as the policing of piracy or brigandage.

For example, the cost of establishing a resident factor in a foreign port is approximately the same whether trade with that area is of a value of £1,000 or £1 million annually. The reduction in costs through better information on prices and quantities may not be worth while in the first case, but is more likely to be so in the second. Similarly, when trade with the West Indies was small, the costs of eliminating piracy were simply too great relative to the benefits to be undertaken; but at some point, the increased volume of trade warranted the expenditure:

Changes in decision rules of the government are a factor which can be referred

¹ While changes in factor prices resulting from population growth and changes in decision rules of government are exogenous, changes in market size are partly endogenous (from population growth and relative price changes) and partly exogenous (from political and military actions). Other forces which produced disequilibrium were changes in the norms of behaviour—such as the willingness of the populace to accept private property—and innovations. The acceleration of innovation is endogenous to our model, but some innovation would and did occur even in the absence of institutions which enabled the innovator to capture a large share of the benefits of the innovation. They were generally confined to chance discoveries or innovation that involved few search costs or risks. The pace of such innovative activity was so slow that the consequent productivity increase was subsequently swamped by population growth. The introduction of the three-field system is a typical case in point.

to only briefly—at least in this essay. But, clearly, these must play a large part in any overall examination of the evolution of the Western world. The relative power of the crown, of feudal lords, and of the towns—and changes in their relative power over time—were in fact changes in decision rules which basically altered the costs of calling on government to implement economic policy. At present, we simply lack any body of theory to explain these changes.

It should now be evident that we are talking about two different levels of institutions. There are the fundamental institutions that specify the basic "ground rules" such as the underlying "constitutional" basis of property rights and basic decision rules with respect to political decision-making, and then there are the secondary institutional arrangements which may be created without altering the basic institutions. The fundamental institutions may be specified in a constitution or may exist by legal precedent or perhaps only by custom. Sometimes the ways in which these fundamental institutions can be changed are specified, as in the rules for amendment of a formal constitution, but more often they are not. The innovation of secondary institutional arrangements may sometimes take place without any political or legal change, but others require political implementation. Historically, many secondary institutional developments have been entirely consistent with existing basic institutions; but the implications of others have been in conflict with the status quo of property rights or of political decision rules. As such secondary innovations take place, political pressures accumulate to induce a reorganization of the fundamental institutions.

As already emphasized, institutional innovation does not necessarily lead to growth. Some institutional changes lead to the redistribution of income and actually reduce output. The history of ancient civilizations as well as of most underdeveloped economies today bears witness that it has often been more profitable for entrepreneurs to develop institutions to redistribute income than to innovate productivity-raising institutions. The essential key to our essay is that cumulative changes in secondary institutional arrangements ultimately led to a restructuring of fundamental institutions in Western Europe over this period, in such a way that individuals in the society were now encouraged to strive for greater productivity in their economic undertakings. New incentives had arisen in the form of increased private profitability of innovation and improvement in the quality of factors of production. To put it more specifically, while the social rate of return on innovation and capital formation (both human and physical) had always been high, changes in organization and property rights increasingly brought the private rate of return accruing to individuals and groups nearer the social rate of return. Growing efficiency was the inevitable result.

IV.

The implications of the preceding sections are that basic economic changes have created a potential for profitable opportunities which could be realized by the innovation of economic institutions. In this section, we shall explore these implications in what must, of necessity, be no more than a brief sketch. Our primary objective is to illustrate the promise of this model. The illustrations will mainly be drawn from English experience.

While our model has implications for the way in which feudal institutions evolved, we here examine only the way in which they declined and were replaced. The basic economic characteristics of the medieval world before 1100 were these: (1) abundant land was available for colonization and settlement, of approximately equal quality to that already settled; (2) labour was relatively the scarce factor of production; (3) of the small volume of trade, most was confined to local exchange of goods and services: what long-distance trade existed was based essentially on differentials of resource endowments between regions, occasionally including differentials in specialized human capital investments; (4) the rate of innovative activity appears to have been very low.

The force which upset this economy was population change. The fundamental institutions of feudalism had developed because of the scarcity of labour relative to land, which made it imperative to capture from labour the rents not existing from a ubiquitous supply of land.¹ Population pressure undermined the economic basis for the institutional organization of feudalism by reversing the relationship of prices as a result of diminishing returns and by expanding the size of markets. Increases in population relative to a fixed supply of good land led to agricultural prices rising relative to non-agricultural prices; this in turn increased the value of land and decreased real wages as the output per labourer fell. Growing population, colonization, and consequent different regional factor endowments led to expanding trade. The result was that landlords now found it to their interest to commute labour dues to payments in kind and in cash, and to lease the demesne lands in return for rent.

On the other side of the scale the rising value of land also produced a basic disequilibrium in the medieval world. Land now offered vastly higher returns if only they could be captured by individuals: a continuous pressure arose to eliminate common-property use of land and to achieve private exclusive ownership. The enclosure movement, undoubtedly the most dramatic of the institutional changes induced by this relative price change, resulted in a reorganization of property to permit exclusive ownership. Voluntary enclosures date from precisely this period.

Population pressure also exerted significant effect on the non-agricultural sectors of the economy. Because it was unevenly felt throughout Western Europe, and not felt at all in Eastern Europe, the result was to differentiate increasingly the relative factor endowments of different regions and this, in turn, led to greater reason for trade. However, potential profits from trade were obstructed by high transactions costs due to lack of information about potential markets and to the existence of piracy and brigandage on a widespread scale. Not surprisingly, merchant groups now undertook concerted action to reduce these costs. The development of merchant-trading groups, the establishment of resident factors in different cities to increase information flows, and a drive to eliminate or reduce piracy on major trade routes during this period were all designed to enable merchants to capture the ever-growing gains inherent in long-distance trade. Deposit banking,

¹ Prof. Evsey Domar, in an unpublished essay which he has been kind enough to show us, constructs a model which explains the perpetuation of serfdom in Eastern Europe (in contrast to its demise in Western Europe) in terms of a gentry having the ability to appropriate "rents" from labour when land is ubiquitous. In contrast, in Western Europe, when land becomes scarce, the gentry can appropriate the returns from land. This explanation is consistent with our more general model.

insurance, and predecessors of the corporation were just three examples of institutional arrangements developed to reduce information costs and risks during the period.

The expansion of trade led to two other significant institutional consequences. (1) Formal contracts came to replace the earlier informal agreements, as the size of the market made trade relationships more impersonal; the rise of contractual obligation was an important step in the development of property rights. (2) Existing political administrative units were increasingly inadequate to meet the needs of expanding trade which required a wider scope of fiscal policies, policing protection, and information; consequently, larger political units grew up or consolidated to keep pace with the growing market size.

As discussed in the preceding sections, we do not know exactly when a check in population growth tended to counter these processes. However, the effects of the long decline in population were striking. Relative prices reversed. Land now relatively more abundant became less valuable; labour became more scarce and, as a consequence of competition between lords to acquire labour, more dear. To recapture the loss in rents from the now more valuable labour, the lords attempted to use their political power to reimpose feudal obligations. Peasants and labourers, on the other hand, saw freedom from these obligations as a chance to capture more fully the returns of their own labour, which had now risen strikingly in terms of real wages.

Our model, in these circumstances, would predict a period of rising social tension and of conflict between these groups, requiring an exploration of the structure and distribution of political power of the times to foresee its resolution. To the extent that the political power resided with the lord, he would be able to reimpose feudal obligations; to the extent that it was more widely diffused among diverse political interests, he might be less able to capture again the rents from labour.

With respect to the non-agricultural sector of the economy, the decline in population served to reduce the aggregate volume of trade in two ways: it affected both the total size of the market and the difference between regions in Europe. Thus, in a world of high transactions costs, it reduced the bases for trade. While it is true that per capita income increased and the distribution of income shifted in favour of the working classes (which would result in a shift in the composition of demands), it would be surprising if the income elasticity of demand for imports would be sufficient to overcome the forces making for a decline in trade. A further trade-reducing factor would be the higher transactions costs associated with declining volume. In the first section, we sketched how merchants found it profitable to reduce transactions costs by stationing factors in a distant city to acquire information about prices and possible trading opportunities; as the volume of trade shrank, this was no longer expedient.¹ Information flows dried up and trade volume was further reduced. It is thus not surprising that economic historians have found depression (for them meaning a decreased total volume of economic

¹ The Hanseatic League developed in this period not only to consolidate information sources, but particularly as a defensive "institution" to perpetuate the dominance of these northern European cities in the face of declining trade and severe competition from outsiders. Our model would predict that in periods of contracting markets the institutions which would develop would be redistributive in character (such as guilds).

activity) even in the midst of this world where higher *per capita* income would presumably have followed the relatively increased real wage that peasant and worker must have been experiencing.

With the advent of the sixteenth century the changing pattern of relative prices leaves little doubt that diminishing returns had obviously once again set in. Real wages declined dramatically throughout the century. While the decline in real wages and in the value of labour tolled the final and ultimate demise of feudal obligations (since labour became relatively less valuable), it equally rang in the effective rise and fundamental institutionalization of private-property ownership as a consequence of rising land values. The enclosures taking place at this time occurred in areas precisely predicted by the theory we have sketched—in pastures producing raw wool and in areas suitable for truck farms. The former was in response to an expanding demand for raw wool and the second to increases in local demands for foodstuffs by the growing urban areas. The sixteenth-century enclosure movement was most extensive in the highland regions of England because the returns to enclosures were higher there than in the arable regions, for two reasons. First, the areas suited to pasture had a lower population density than did the more arable ones; hence, in terms of our model, fewer people had to reach agreement for the enclosure to occur. Second, and probably more important, the increase in the price of wool would have caused individuals holding land in common to use it inefficiently by each attempting to pasture more sheep. The cost to the individual of pasturing another sheep on the common approached zero, but the cost to society of everyone doing so was clearly positive. The common would tend to become overgrazed and the total output of wool would actually decline—providing a classic example of an externality associated with common-property resources. Individuals with the power to enclose the common could avoid this occurrence by enclosing areas and denying access to all others. The extinguishing of the rights of the common allowed the new owners to increase their private output (and that of society) at the cost of persons excluded from the common, who were obviously worse off. However, since the pasture was now more efficiently used, the costs and benefits to society were brought closer in line with those accruing to the individual.

The arable land areas of southern England were slower to yield to enclosure. The cost of achieving agreement to the process was obviously higher where many persons were involved. Also, potential external diseconomies in these areas were less onerous than in the grazing areas. For one thing, the problems attendant on a common-property resource were less pressing, since here individuals farmed their own strips and captured the benefits directly; it was only on land held fallow or between crops and on the wastelands that common rights existed. Additionally, the reclamation of swamp and wastelands may well have provided a less expensive alternative for expanding output than would the undertaking of arable enclosure during the sixteenth and seventeenth centuries. In any event, the complete enclosure of arable lands had to await the use of the coercive power of government in the eighteenth century as a means of reducing its cost.

Turning again to the non-agricultural sector, we find two basic forces making for a rearrangement of institutions in these centuries. The first, which had already existed in the earlier period, was the divergence in relative prices due to differen-

tiation of factor endowment among different regions in Europe, as well as between Eastern and Western Europe (since the eastern area lacked the pressure and diminishing returns characteristic of Western Europe). Interregional trade flourished as the shifting comparative advantage of different areas offered entrepreneurs new profits. Another influence leading to substantial increases in trade was the inflationary effect of an influx of treasure from the New World. While the emphasis of Hamilton and subsequent economic historians has been on the resultant lag of wages behind prices (a hypothesis which is supported neither by theory nor by evidence), the real consequence of the treasure was its impact upon expansion in the size of markets. The importation of precious metals into Europe via Spain stimulated the growth of all the Western economies by increasing the incentive to trade. The consequence of the expansion of trade was an era of substantial institutional innovation which has commonly been described as a "commercial revolution". Typical of the institutional innovations were the joint-stock company, a variety of sophisticated forms of insurance, and the development of international financial markets—all devised in response to the profitable potential of reducing information costs or spreading risks. Convoys and naval expeditions were organized to combat piracy. Cities like Cadiz, Lisbon, Bordeaux, Rouen, Antwerp, Amsterdam, Bristol, and London gained stature as trading centres, developing commercial and financial institutions to increase the flow of trade. It must be emphasized at this point that the consequence of this was a substantial increase in productivity; that the growth of increased information, as well as the decline of piracy and of other obstacles to trade, lowered the cost of the movement of goods between areas in dramatic fashion. Indeed, just as we look upon the innovator and technological change as being the great sources of productivity change in the period of the Industrial Revolution, we have been remiss in not looking upon the merchant and the provision of increased information as having performed the same function in the era of commercial growth.

A classic example of an institution evolved under the impetus of such newly profitable opportunities is the joint-stock company. This arrangement not only served to spread risk by making shares available to individual owners but it also increased information about trade by stationing resident partners in various locations and at times even protected its participants by its own police power.

The international financial markets which grew up in Antwerp and Amsterdam were also a consequence of the growing profitability of international trade. Expansion and greater profits for the merchants would attend any increased knowledge of the supply and demand for capital. These institutions performed such a function, thereby lowering the cost of capital and expanding trade.

The expansion in the size of the market encouraged innovation in two basic respects: the first was a natural consequence of specialization and the division of labour in the classic sense that Adam Smith described the process. In terms of our model this simply lowered the costs of discovering an innovation. The second was that the expansion in the size of the market raised the potential returns to innovation. However, as long as the innovation was freely available to be adopted by other entrepreneurs, most of the benefits generated could not be captured by the innovator.

The granting of monopoly privilege by the Elizabethan crown to ensure that

inventions introduced in Western Europe might profitably be imported to England was a governmental device to encourage the adoption of improved techniques. The way in which such monopoly grants gradually evolved into a patent system embedded in the legal structure of English common law in the Statute of Monopolies of 1624 has been told elsewhere and illustrates the way in which a cumulative set of secondary institutional innovations led to a change in the fundamental institutional structure.¹

The implications of the Statute of Monopolies far outreached the statute itself. In an earlier period, the power of government had been the most feasible agent to break down such barriers to trade as the threat of piracy and the proliferation of local monopolies; the very basis of mercantilism had been a tacit banding together of government and merchants to realize profits from commercial venturing. By the end of the sixteenth century, markets had widened and the potential gains from expanded foreign and domestic trade had increased to the point where government intervention not only seemed unnecessary but was now actually costly and hence unwarranted. Officially created monopolies now thwarted merchants and traders bent on capturing the growing trade. Even when the granting of monopolies was first inaugurated some grants had been tossed as largesse to court favourites (and were therefore purely redistributive in effect rather than a stimulation to trade). Now all monopolistic grants became increasingly suspect as vehicles of privilege and as devices to redistribute income by denying free access to the profits inherent in expanding markets. Pressures arose to oust the government and its monopolistic grantee groups from their entrenched positions.

The fundamental political conflicts of the seventeenth century reflect this resistance to oppressive influences in trade and commerce; the evolution of the first voluntary business organization, in the form of the joint-stock company, was a logical development. In this context, the crises of the seventeenth century and the revolutionary period between 1640 and 1688 are fully consistent with the model we have outlined.

It is clear that by this time substantial productivity increase was already taking place in the Western world. We see it strikingly evidenced in the case of shipping, where the gains stemmed not from technological change but from the decline of piracy (allowing a decline in crew size) and from the growing size of markets which reduced turn-around time and port time for ships. All these phenomena manifested declining transactions costs of the kind we have described.² A productivity change similar to that described for shipping was also happening elsewhere, particularly in trade and commerce, where transactions costs were moving inversely to the growing volume of trade and commerce.

Sustained economic growth in the Western world required the creation of institutions and property rights that served to bring the private rate of return to individual activities more nearly in line with the social rate of return. This means that the individual's perception of his own gains from undertaking an activity

¹ 'Innovation and Diffusion of Technology: A Theoretical Framework', by Douglass C. North, is forthcoming in the Proceedings of the Fourth International Congress of Economic Historians at Bloomington, Indiana, and is to be published by the University of Indiana Press.

² See Douglass C. North, 'Sources of Productivity Change in Ocean Shipping, 1600-1850', *Journal of Political Economy*, LXXVI (1968).

would in practice closely approximate to the benefits that society would receive from that activity. This necessitates a set of property rights and institutions that ensures that the factors of production directly receive their economic value.

Because it lacked such provisions, the late medieval world was beset by population growing more rapidly than output. Much of the land was held in common (and all had ill-defined property rights); when it became scarce, no economic incentive assured its efficient utilization. Labour, tied by law and by custom to a specific activity, had neither the opportunity nor the incentive to increase its productivity, either by seeking its most efficient employment or by improving its efficiency in its existing occupation. The institutions and legal attitudes of feudal Europe generally were designed to channel the energies of individuals away from productivity-increasing effort.

In contrast, the English economy at the end of the seventeenth century had achieved or was in the process of creating within its social structure a set of institutions and a common law that jointly encouraged improvements in productivity. Each factor of production was able to receive the bulk of its economic value. Land was in the process of passing into private hands, with the owner having the right to exclude others from its use and freely to alienate his property. Any improvements made were captured by the owners, who therefore were motivated to use their property to obtain the highest returns. Labour had been freed (with minor restrictions) to seek its best employment; what skills a workman developed were his to sell as best he could, as he was no longer subject to arbitrary exploitation by some third person. The development of private property and the legal enforcement of contracts reduced the externalities and risks that had been present in the feudal world, thereby raising the rate of return on undertaking all kinds of economic activities. The development of a patent system and other laws protecting intellectual property (however imperfectly enforced) encouraged the growth of innovation. In addition to the patent system (which was always imperfectly enforced) prices, bounties, and subsidies were all used to encourage innovation and produced the same consequences in terms of our model.

In effect, a cumulative series of once and for all secondary institutional arrangements had gradually led to the reorganization of the fundamental institutional structure. This basic change was clearly evidenced by the characteristics of the property rights that had evolved. The social milieu of England at the end of the seventeenth century served to direct the individual efforts of Englishmen into channels that increased the productivity of society, where earlier the social structure had encouraged economic activities that mainly redistributed existing income. This change was a necessary prerequisite for Western man to escape the Malthusian trap.

V

The explanatory sketch outlined above suggests that the cause of the rise of the Western world was the redirection of incentives as a consequence of the development of institutions which made it more profitable to attempt to increase productivity within any economic activity. Such institutional innovations, as we have pointed out, are in direct contrast to those that throughout most of the history of mankind have served mainly to redistribute income. The two major

forces making for this change in the Western world were variations in relative prices and expansion in the size of the market.¹

Because the theory rests on response not only to market forces but also to non-market forces inherent in the coercive power of government, we cannot make any definitive statement about the inevitability of such an outcome; presumably some combination of political power under other circumstances could have thwarted the pressures for productive institutional changes—as they clearly have done in other societies up to the present day.

This point requires emphasis. There is no way to predict the outcome of conflicting political groups or coalitions, and therefore there is no certainty that political policies which will induce "productive" economic changes will be passed. We do not have a theory of the state that allows us to predict the outcome of such political conflicts, and indeed the theory of non-zero sum games suggests in fact that the results are indeterminate.

Nevertheless, in spite of these limitations on the explanatory sketch developed above, the implications and promise are revolutionary enough.

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¹ There are striking similarities—and differences—between this model and a Marxian model. In both, the development of a system of private-property rights was a critical aspect in unleashing the productive forces of economic growth (capitalism in the Marxian terminology). There are other similarities in the analysis of the characteristics of the feudal economy and the capturing of rents (surplus value) from the labour of the serf. Both this model and Marxian writing on the seventeenth century look upon it as a century of turmoil in which a basic restructuring of political power was necessary to implement the institutional changes essential to economic growth (a capitalist system). The most critical difference is in the sources of disequilibrium in the system which induced change. In the Marxian model it is technological change. In our model it is the change in relative prices and expansion in the size of the market.

