

The Economics of Sea Power. Property rights arrangements and institutional change in Elizabethan England

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Abstract

This article focuses on the institutional conditions that helped England to be transformed into a sea power during the reign of Queen Elisabeth I (1558-1603). Institutional change was the result of a successful coordination of public choices in order to organize national defense and privateering expeditions against Spain's trade and its New World colonies. The creation of the stock-market and the establishment of joint stock overseas trade companies were both the outcome of a large alliance between public and private interests, leading to an effective arrangement of property rights and of the appropriate incentives related to them, inaugurating a path responsible for the development of Great Britain over the next centuries. From a methodological point of view our analysis provides an assessment of the appropriateness of the conceptual framework of property rights in understanding commercial capitalism.

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1. The historical background: A Kingdom in Peril

England's situation at the coronation of Queen Elizabeth the First, in 1558, was precarious. It has rightly been argued that during the course of history, the sea has been used as a way of invasion, and just as often as a defensive moat¹. Concerning the British Isles, the sea was the way of invasion for the Romans, the Saxons, the Scandinavian Vikings, the Danes, the Norwegians of Harold Hadrada and the Normans of William the Conqueror. It looked likely that history would repeat itself through a Spanish invasion during the reign of Elizabeth.

Indeed, after the peace of Chateau-Cambresis of 1559 with the French, England's main enemy was the Spanish - Habsburgian Empire of Phillip the Second (1556-1598). It was a multinational empire of great geographic extent, encompassing Spain, the Low Countries, great parts of Italy in the North and South, Sicily and Sardinia, Portugal (annexed in 1580), Franche Comte, and the vast empire in Central and South America as well as the Philippines in Asia. The population of the European part of the empire was about 20 millions, of which 10 million were in the Iberian Peninsula, out of a total of 95 million for all of Europe including the European parts of Russia and the Ottoman Empire².

In 1580, England and Wales had a total population of about 4.5 million, and although it had a homogenous population, it could not be considered a great economic or military power. England did not have any colonies and although some of the Channel ports had an important seafaring tradition, its commercial navy was smaller than Holland's, Spain's or France's and comparable to that of Venice or the German Hanseatic cities, both of which had smaller populations. The land armed forces of the empire were comprised of about 200,000, while those of England 30,000³. The Spanish army with its famous «tercios» regiments was the best in the world, while its navy had gained resounding victories against the Turks in Lepanto (1571) and the French - Portuguese in the Azores Sea (1580).

The deteriorating political relations with the Spanish empire made a sea born invasion a real menace. England's leaders understood that in order to face successfully Spain's challenge, they had to adapt their military strategy and become a naval power, just like Athens did under similar circumstances, when faced with the Persian

invasion of 480 BC. Two major improvements were introduced in naval technology, namely galleons and iron guns.

During the second half of the 16th Century, the galley, a direct descendant of the ancient Greek «trieris», was the dominant warship type in the Mediterranean. It was totally unsuitable due to the need for greater range and for facing big waves, in the open Atlantic waters⁴. So, new ship types had evolved, the naves, carracks and caravelles, which had sails as their sole propulsive power. For military purposes, they evolved into the galleon, a long ship with clean lines, armed with guns of various calibers, on usually two levels at their sides. The fire of a galleon's broadside could sink any galley. During the period under consideration, neither England nor Spain had built enough purpose galleons, so that both fleets pressed into service armed merchantmen. Although Spanish and English ships had more or less the same displacement, English galleons were faster and more maneuverable and had a marked superiority in their rate of fire, due to more efficient gun carriages, that allowed faster reloading⁵.

In the field of artillery, England, forced by circumstances, made substantial progress by 1540. Till then, most guns were made of bronze. In the 1540s, the first iron foundry was established with the Crown's support, at Weald in Kent. In 1543 an «international» team with Frenchman Pierre Baude and Englishmen William Levett and Ralph Hogg produced the first cast iron guns. From a technological stand point, iron guns had many disadvantages compared to bronze ones,⁶ but they offered one decisive advantage for England: Iron abounded in the country and cost one tenth of the price of bronze. During a period of increasing inflation, the price of cast iron guns decreased from 10-12 pounds per tone in 1565-1570, to 8-9 pounds in 1600⁷.

The necessity of creating a «defense industry» as it is called today, is a classic example as to how technological progress in this sector creates links and spillovers that are beneficial to the growth of the economy as a whole⁸. During a period of forty years, the iron industry was so developed that in 1573 there existed seven foundries producing 400 tons of guns and shot per year, being only part of the total iron industry. In 1520 there existed just one blast furnace, increasing to 67 with a capacity of 1300 tons by 1570⁹. So, England, which by the beginning of the century was an importer of guns, had become the foremost producer and exporter of cheap iron guns by the end of the century, being practically the

only country to possess that technology¹⁰. Although it is broadly accepted that the industrial revolution in England began at about 1750, it is clear from the above, that as far as the iron industry is concerned the process characterized by mass production, very high rates of growth and import substitution by exports, began during the second half of the 16th Century.

Hence, pressed by necessity, England developed an improved weapon's system that consisted of the new fast galleon armed with iron guns on efficient four-wheel carriages. This partial naval superiority would not be sufficient, if it was not combined with a pertinent improvement of strategy and tactics. The Spanish plan was based on collaboration of naval and land forces. The fleet under the Duke of Medina-Sidonia would sail from Spain to join the army of the Duke of Parma at Calais, which was 60,000 strong. There, the army would embark and the fleet would transport them for a landing on the southern English coast, in a repetition of William the Conqueror's landing¹¹. If it succeeded in this, the subjugation of England appeared almost a foregone conclusion, because the English did not have an army strong enough to defeat the Spanish. The weak point in the Spanish strategic plan was that not possessing in Spain itself the necessary army to embark directly on the fleet, they had first to join forces with Parma, before attempting the invasion¹². Success depended on land and sea forces coordination and the prevention of their meeting became the focus of English strategy.

The Spanish based their naval tactics on boarding the enemy's vessels and capturing them. So they embarked a strong element of naval soldiers. The English wanted to avoid boarding and transform the battle into a long-range gunnery contest. Having faster and more maneuverable ships and a faster rate of fire, they managed to achieve this, but they did not succeed in breaking the Armada's admirable discipline and defensive order. The Armada anchored before Calais, awaited Parma's embarkation. At this crucial moment, at dawn of the 7th August 1588, the English used their secret weapon, fire ships. Although the Spanish managed to avoid them, the attack achieved its aim. The Spanish ships had to cut and leave their anchors, in order to sail in a hurry. But without anchors they could not come back to embark the army and they had to continue sailing on, contouring the British isles and loosing 42 out of their 107 ships in storms and shipwrecks¹³.

2. Political organization and public finance

The transition of a country from a land to a sea power demands structural organizational modifications and results in significant social changes. Such was the case of Athens's transformation after the Persian wars, and England followed the same rule. For the Armada campaign, the English fleet comprised 110 warships (galleons and converted merchantmen), 15 supply ships, 6 small warships of less than 100 tons each plus 95 other small ships for various duties. The total crews of the ships have been estimated at about 16,000¹⁴. Naval population in England was more or less stable for the period 1500-1550, but demand for manning the royal ships increased, reaching a peak in the Armada years, when out of a total naval population of 16,255 in 1583 the fleet needed about 16,000¹⁵. So, even if all English sailors were employed in the fleet, their total number, taking into account illnesses, desertions etc., would still be insufficient. The demand gap had to be covered from other sources of the population, these being the inland counties. As early as in 1586 these counties were ordered to supply men (farm laborers, workers, and artisans even condemned criminals) to man the fleet. During the last twenty years of Elizabeth's reign (1583-1603) an increasing number of inhabitants of inland counties would abandon the difficult living conditions of the countryside to seek their fortune in the sea. The very lucrative voyage of Drake's ship «Golden Hind» in 1577 had fired the fantasy of the courageous young Englishmen, turning them to the sea. As a result, England's naval population, after remaining stable for about the first 60 years of the 16th century, had at least doubled during the last twenty.

Opening itself to the sea, England not only laid the foundations of sea power, but also transformed its political system towards increased freedom and democracy, a change that would become more apparent during the next century. Naval population was clearly more progressive than the purely landlocked one and this again manifested itself during the English Civil War. The naval cities and districts supported Parliament against the Stuarts, contributing substantially to its victory¹⁶. Once again in history, naval power and constitutional government went together. Strong navy requires great expenses, only affordable by strongly supported and stable governments capable of translating that support into longterm political commitment¹⁷.

A thorough comparison of the economies of the Spanish Empire and England seems on a first look, strongly in favor of the Empire,

which had five main sources of revenue: 1. Direct taxes like the tax revenue of the Spanish Kingdom, mainly Castile; other taxes like that paid by the «Mesta» Guild of shepherds producing wool, sales tax «tomsa», and «crusading tax» on ecclesiastic property. 2. Taxes levied in Italy and the Low Countries. 3. Custom duties levied in Italy and the Low Countries. 4. The American colonies, mainly from the silver Potosi mines in Peru (discovered in 1543). 5. Profits from bank capital invested in the most important banking centers of the time belonging to the Empire, namely Milan, Seville, Cadiz and mostly Antwerp.

But on the other hand, public expenditure increased even faster during the 16th Century, because the Empire fought continuously on many fronts. In the Mediterranean and North Africa against the Ottoman Turks and their tributary corsair kingdoms of Algiers and Tunis, in Italy against the French and some of the Italian states, in Germany and Bohemia supporting the German Habsburg branch against the Hussites and the German Protestant Princes, in the Low Countries after 1572 against the rebelling Dutch and during the last twenty years also against the English. Spain was suffering from «imperial over-stretching» not being able to, despite its strength and wealth, overcome all its enemies at the same time¹⁸.

The cost of war made obvious the financial weakness of Spain. When Charles V resigned in favor of his son Phillip II in 1556, the latter inherited a public debt of about 20 million ducats, which could not be served by Spain's normal revenues, resulting in Spain's bankruptcy the following year. This brought down also its debtors, especially the great bankers from Augsburg, the Fugger family¹⁹. Phillip's revenues doubled during the period 1556-1573 and more than doubled, to the end of his reign. The revenues from America's silver mines have been estimated at 12 million ducats for 1571-1580 and over 25 million for 1591-1600, but expenditure rose even faster. The Armada's cost was 10 million ducats in 1588 and Phillip had serious problems in financing his fleet. So, he was obliged to recur to increasing loans mainly from the Genoese bankers under increasingly negative conditions: The Genoese gave cash loans to Phillip in exchange for contracts, known as «asientos», which tied to them increasing future quantities of silver from the American silver mines²⁰. In 1596, when Spain went bankrupt for the third time within the same century, public debt had risen above 100 million ducats, so that interest rates on it took two thirds of the total revenue²¹. Within twenty years, Phillip's debt increased four fold²².

A dramatic economic consequence of the war effort was the «great inflation» resulting from the inflow of precious metals, mainly American silver, without an analogous increase in production. Nominal agricultural prices rose by 500% and «industrial» ones by 300% between 1500 and 1630. Scholars living at that time, like Salamanca's Professor Martin de Azpilcueta, noticed with surprise this phenomenon, trying to give various explanations. This phenomenon gave rise to a passionate debate between Sieur de Malestroit who suggested that depreciation of money was due to an internal devaluation of the currency and Jean Bodin who has tried to explain «inflation» as a result of the great increase of currency circulation (money supply), in a crude presentation of the quantity theory of money²³.

When Elizabeth was crowned in 1558, after the death of her sister Mary Tudor, first wife of Philip, she brought to Parliament a naval law-budget, for the construction of «the strongest wall of defense that can exist against the enemies of this island»²⁴. A permanent naval budget was thus introduced, under the supervision of the Treasurer of the Navy, which enabled England to lay down the nucleus of its fleet of war galleons, 14 of which were built in the five years till 1564. The naval program gave an impetus to the steel industry, as stated above, and to the shipbuilding industry. During 1548-1551 only 100 persons were working as paid members by the English Treasury in the dock yards, while already by 1559, 520 «shipbuilders» and 100 «workmen» worked at the three royal shipyards at Deptford, Woolwich and Portsmouth. By comparison, the greatest «private industry» of the time was a turf producing plant in London, which employed 7 workers and 11 apprentices while the biggest «industrial firm» had a total capital of 20 pounds!²⁵

Elizabeth's public revenue in 1575 was 300,000 pounds (at an exchange rate of five shilling and six pence per ducat), only one-eleventh of Phillip's revenue. After ten years of good administration, by 1585 Elizabeth had a surplus of 300,000 pounds. As soon as hostilities with Spain began, the Parliament voted an additional expenditure of 72,000 pounds per year. At the beginning of 1588, Elizabeth, thanks to the sound financial advises of Sir Thomas Gresham, had a surplus of 154,000 pounds. In the same year the English fleet cost over 150,000 pounds, while for the period 1580-1590 total yearly average public expenditure rose above 350,000 pounds²⁶. The English Crown tried to cover a part of this expenditure by selling some of the Crown's land, or monopolies revenues.

Revenues arising from those two sources were insufficient, so that Elizabeth had to convene the Commons and ask for additional taxation and grants for a total of 2 million pounds. When the Commons voted favorably, the Crown was in a position both to pay the sailors of the fleet and to avoid bankruptcy, while Phillip often could not achieve the first and did not avoid the second. But, on the other hand, the fact that the Crown had to summon the Commons resulted in strengthening its position and increasing its political power as well as of the classes and regions that it represented.

3. Property rights' structure and economic efficiency

The Anglo-Spanish War is a very good example of how a smaller country, when it manages to create more efficient economic institutions, can overcome a stronger military and economic power. As many historians have suggested²⁷, Phillip's Empire was a «model» of inefficient and short-viewed economic policy. The tax system was unjust, weighing heavily on particular regions and classes, giving rise to counterincentives and distortions. Castile bore the main tax burden. A representative body, the «Cortes» existed also there, but with much reduced power to control public expenditure and with the important difference as compared to the Commons, that in the Cortes were represented almost solely the landed aristocracy without also the commercial, industrial and financial interests of the country. Taking this into account, it is not strange that the Cortes approved taxes that had to be paid by the other classes and not the aristocratic landowners, such as the «alcabala» (10% levy on commercial exchanges), the «encabeziamento» (a yearly per head tax), the «millones» (a tax on alimentation products), the «servicios» (grants) etc.²⁸ All these taxes, together with the internal custom duties between the various ex-Kingdoms (Castile, Aragon, Leon, Andalusia, Luzitania etc) of the Spanish peninsula inhibited commerce and resulted in a reduction of the incomes of the poorer classes of the population, while at the same time discouraging the initiative for new productive activities. Not accidentally, the «hidalgos» distrusted commerce and chose a career in the church or the Army, the only institutions that the Crown did not dare to touch²⁹. The system of counterincentives resulted in a deficit of specialized labor

and capital for investment purposes which had its direct repercussion also in the military effort: In contrast to England, in Spain itself there was no development of a gun producing and iron industry except for a few small foundries, and «Spanish» guns were mainly foreign imports from Italy, the Netherlands and Germany, bought with silver from the New World.

A second example of the counter-productive structure of property rights, is the prerogatives of the «Mesta» guild of sheep owners and shepherds, which the Crown had already granted them in the 13th century. The «Mesta» was taxed for the right to graze its sheep. In exchange, the shepherds and their flocks could roam the countryside and feed anywhere, without any prohibitions. This led practically to the inexistence of property rights in land that could be used for extensive high quality, high yield agricultural products. As a consequence, Spain was all the more dependent on foodstuff imports, mainly cereals for its increasing population, with frequent outbursts of famine. Moreover, not having its own merchant fleet, these imports were being made by using ships of other countries, (Dutch, French, English, Genoese, Venetian) which were not infrequently in a state of war with Spain. The directive to the shipyards of the Biscayan ports that they should build warships as against commercial vessels, especially after the Armada's losses – and the custom duties on wool exports which benefited the English and Flemish competitors³⁰, aggravated the inefficiency of the economic system. Spanish products became even less competitive in international markets, as an early manifestation of the phenomenon that has been recently called «Dutch disease»³¹.

On the other hand, Elizabeth's government managed to stabilize the pound and control inflation thanks to Gresham's monetary reform. During the war years against Spain, thanks to a cautious and efficient fiscal policy, it managed to spend only 4.5 million pounds. This corresponded to one third of the total public expenditure³². The basic difference with Spain was that England covered the expenses mainly from its yearly revenues, avoiding external loans and eventual bankruptcy. In parallel, England's armed forces were regularly paid, in opposition to those of Spain which were not. Also, at the initiative of the English Admiralty, an innovative system of assistance for sailors and their families was introduced which took over their economic support and health care in the case of maiming, illness or death.

However, the true institutional change came out of the reorganiza-

tion of property rights in overseas commerce. The English rulers realized that the main source of Spain's power and wealth were the American colonies and their silver and goldmines. So, they decided to hit and if possibly destroy, not directly the Habsburg's armed forces, but the economic foundations that financed them, inaugurating an early form of «total war». The legal status of trade with the Spanish-American colonies was conducive to interference. From the Treaty of Tordesillas of 1494 between the Spanish and the Portuguese, the New World was divided in two spheres with the Western Indies going to Spain and Brazil, Africa and Asia being given to Portugal, to the exclusion of all other European countries. The Spanish introduced a severe monopoly of trade with their colonies, excluding all foreign traders and considering them as pirates. So, all non-Spanish merchants wishing to trade with the Spanish colonies had to arm their ships with guns for defensive purposes and always be ready for combat. From this point on to open piracy the step was a small one. On the other hand, in many cases, Spanish settlers themselves put the Spanish monopoly aside and traded with French and English merchants buying mainly African slaves (whom the latter had bought from the Portuguese), and selling them in exchange for sugar, tobacco, pearls and skins.

English, French and Dutch attacks against the Spanish New World settlements had already started during the reign of Queen Mary Tudor (1553-1558), sometimes as purely piratical enterprises, and sometimes, when a state of war between England and Spain existed officially. From 1557 on as corsairs whereby every ship and its captain was provided with a «letter of marque» or a «letter of reprisal», which permitted to the said ship to attack the ships and settlements of the enemy. The ship and its captain were no more an outlaw pirate but a corsair or privateer, i.e. a private person in the service of his Queen and country, officially empowered to attack the enemy's trade³³. Of particular importance for England was the fact that these enterprises during the second half of the 16th century linked trade, war, piracy and privateering with the religious feeling of «holy» war of the Protestants against the Catholic League, with patriotism and economic gains. These gains were distributed from the highest levels of society, the Queen and the Lords of the Admiralty (who received 10% of the sales at auctions of the seized enemy property), to the ship's captains, to the financiers-bankers of the expeditions, to the merchants who bought and resold these goods, as well as to the common sailors and soldiers who had their share in profits³⁴.

While at the beginning of the period privateering had much less importance than other economic activities, such as the wool industry, by the end of the period the great change had been accomplished. Due to England's successful response to Spain's invasion threat, England turned itself to the sea, and the «naval economy» with its linkages with other sectors (such as the iron industry, shipyards etc) had become by far the most important. Furthermore, this «turn to the sea» led to the establishment of a new institutional framework concerning property rights that was conducive to sustained economic growth. In a period when government was entrusted to the local gentry and to landowners who were not paid by the crown for their services, Elizabeth did not have the power and probably neither the will to stop piracy during peace, even if such activities were diplomatically harmful. But in times of war the pirates were immediately transformed into privateers collecting a valuable pool of experienced sailors and warriors. Already by 1563 Elizabeth granted the first «letters of reprisal». During the next twenty years privateers would enrich themselves together with their crews and investors becoming at the same time famous national heroes.

Most famous amongst them was one of the Armada's victors, Sir Francis Drake, who undertook his first raid against Spain's New World possessions in 1571. In 1577 he repeated his expedition with his ship «Golden Hind», which would result in the second world circumnavigation voyage after Magellan's. His investors were nobles, members of the Royal Council like Sir Francis Walsingham, the Secretary of State, Queen Elizabeth herself and London banking circles. In the Pacific Ocean, outside the coast of Peru, he captured the Spanish galleon *Nuestra Senora de la Concepcion* loaded with 26 tons of silver. At the Molucas islands he added a valuable cargo of spices, before returning to Plymouth in 1580. The value of his plunder was 600,000 pounds, double the annual Crown revenue, while his investors had a rate of return on their investment of 4,700%! It is clear that such achievements turned the ambition of every adventurous young Englishman, as well as of every «professional» investor, merchant, banker, or nobleman to the sea.

Attacks were not restricted to enemy vessels, but were made also against sea towns. The expeditions increased continuously in the number of men and of ships. If at the beginning of the 1570's the norm was single ships, in the 1590's «private» fleets undertook the expeditions including as many as 26 ships in the last joint expedition of Drake and Hawking against Puerto Rico in 1596. Historians

estimate that the cargoes of seized Spanish ships valued 100,000-200,000 pounds per year for the last two decades of the 16th century, or about 10-15% of total English imports³⁵. During the first three months of the 1587-1588 war, English privateers took 27 Spanish ships for a total value of 294,500 ducats. During the whole course of the war, they took over 1,000 Spanish ships. The English organized a total of 150 expeditions against the Spanish New World possessions, leading to the conquest and plunder of many Spanish towns and settlements in the Americas, such as Puerto de Caballos in Mexico (plundered six times), Porto Bello in Panama, even Cadiz in Spain in 1587 and 1596³⁶. The successes were such that the prices of colonial goods of the Spanish empire were often cheaper in the market of London than that of Seville!

The privateering expeditions illustrate dramatically what is actually called PPP (Public Private Partnership) concerning not only finance but also the practical operational field³⁷. Royal ships participated in the privateering fleets, guns from the royal ships, as well sails, cords, ropes etc were used to furnish «private» merchant ships and corsairs, the captains of which were often officers of the Royal Navy. The final outcome of all those mixed commercial-military enterprises was the establishment of England's, and later on Great Britain's, political and economic dominance till the beginning of the 20th century. England's transformation, by the end of 16th century, into a worldwide naval power started from the overseas «trade» of those mixed commercial-privateer enterprises. All together, as we will see below, Metropolitan England developed the economic institutions necessary for growth. As Rodger remarks «twenty years of war changed England's perspective. While before the Queen possessed an imposing but almost isolated fleet (of war galleons) now naval strength had become a national matter... It was clear that England's future laid in the open seas... The English had learned that the sea was more than a defense against a hostile world: it had become the means to discover new worlds for gold, fame and glory»³⁸.

4. Institutional arrangements and economic growth

Political institutions in a representative parliamentary democracy provide a structure of multiple veto points that entail the uncontrolla-

ble activity of central authority, creating a system of «check and balances»³⁹. In Elizabethan England the feasibility of economic growth was based on a legal framework that protected efficiently property rights from abuse by the central power. Instead of exercising tight control on property rights and taxation like in Spain, the English crown opted for elastic control and granting of substantial rights first to the privateers-entrepreneurs and then to merchants-entrepreneurs in the wool industry.

Long-run successful economic performance of the English economy was furthermore based in the formation of «correct behavioral incentives» not only for economic but also for political agents. The English crown showed a long-run dedication to the safeguard of this framework, avoiding changing it in its favor according to circumstances⁴⁰. The Spanish crown on the contrary, followed an arbitrary policy without an appropriate institutional basis that would bind it in the future. As a result, six consecutive bankruptcies from 1557 to 1647, which brought down with them great financial houses, ruining its financial credibility, destroyed also in the long-run the eventual development of a financial and banking system in Spain. It is not by chance that during the period of Spain's hegemony, all financial centers were located in regions out of mainland Spain and even out of its jurisdiction, like Augsburg, Antwerp, Genoa, Florence and last of all Amsterdam. England not only avoided bankruptcy but continued paying back Henry VIII's debt, thus laying down the foundations of the financial / banking system that made London later the financial center of the world.

North and Weingast (1989) remarked that the war's issue was in doubt and that possibly the crown might have prevailed if England had a standing army loyal to the crown, similar to the one already in existence in France and Spain. Our previous analysis offers an additional answer to the question why such an army did not exist yet in England: its geographic position and Phillip's invasion threat, forced England to opt out for a particular kind of the public good «defense», in the form of a standing navy, instead of a standing army. This choice, as pointed out above, not only gave it victory against Spain, but also laid down the basis for democracy and the institutions that led to sustained growth. By creating a wide «alliance of interests» between sailors, workmen and handworkers of the naval industry, iron industry etc, merchants, entrepreneurs, «capitalists», bankers and noblemen, an alliance that found its expression in Parliament, it gave to it the necessary strength to function as a second

pole of political power against the Stuarts, and thus strengthen the institutions that supported long run stability and sustained growth. The creation of such an «alliance of interests» is one of the most important elements in creating and transforming property rights, more important than vague ideas on justice⁴¹. When during the next century the successors of Elizabeth, the Stuart dynasty questioned the established institutional system, in particular Parliament's position, where the interests of the upcoming «bourgeois» class were represented, the great Civil War broke out.

What's more, in England, the opening to the sea and the «alliance of interests» became an incentive for the creation of two further fundamental economic institutions: the capital-financial market and the broadly based joint stock trade companies. The London Stock Exchange was built in 1566 with money given by Thomas Gresham on a plot of land belonging to the City of London, in Threadneedle Street. For many years, in the street level of the building were operating commercial shops, and Gresham used the rents paid by these shops to get back the cost of his initial investment. As pointed out emphatically⁴² Thomas Gresham was the ideal type of «the businessman who is just as much a public servant as he is businessman and who, though perfectly successful in looking after his own advantage, serves the state in ways that are beyond the competence of the mere public servant».

The coalition of private and public interests is far more important in overseas trade. As seen above, the privateering expeditions were financed also by the crown's direct contribution in collaboration with the financial means of the privateersship owners. A «syndicate of investors» financed Drake's enterprise of 1577, and this was the norm also for further enterprises. In some of them, Elizabeth contributed also her royal warships in addition to her financial contribution. For the 1595 Caribbean enterprise, the Queen contributed two thirds of the total cost of 33,266 pounds. Other main contributors were the Lord Admiral, important nobles of the court and many famous navy captains, such as Hawkins and Raleigh. The bankers and merchants of London took over the management of the company and the furniture of all necessary provisions for the fleet and crews. These enterprises, while aiming at the state's enemy, the Spanish empire, were not part of any long-run strategic aim, other than profit seeking. Profits from each enterprise were financing the next one, in a self-perpetuating process. And profits were very high for everybody, as seen above, from the Crown, the nobles of the

Court, the merchant-bankers (like John Watts whose profit was 32,000 pounds in 1591), the captains and officers of the ships, down to the simple sailors and soldiers.

Before long, the necessary institutional framework was created promoting the development of other sectors. In 1600 was established the famous «East India Company» as a public-private joint stock company with a broad share basis. It became the main instrument of commercial expansion of the British interests in the wider Asia area, till its dissolution in 1857. It followed the examples of similar previous commercial companies (Muscovy Co 1555, Spanish Co 1577, Eastland Baltic Co 1579, Levant Co 1583), which united public and private funds with the purpose of monopolistic exploitation of trade relations with the named geographic regions⁴³. These activities generated positive externalities, where the creation of efficient institutions in some sector –the financial one and the overseas trading companies in our case– works as a basis for the development of other sectors of the economy. The Anglo-Spanish war, waged on private economic criteria of organization and for the sake of profit, had so successful long-run strategic implications and so astonishing unintended consequences, that it would have been impossible to achieve otherwise.

5. Conclusion: Efficient institutional change and property rights

New-Institutional Economics explains the evolution of economic systems as an attempt to determine and arrange efficiently property rights and to lower transaction costs. For the organization and completion of transactions, resources are needed for the determination and the enforcement of the exchange conditions, for the collection and distribution of information and for the determination and protection of property rights before, during and after the transaction⁴⁴. The economic efficiency of an organization (a firm or a system) and the final outcome (profit maximization or economic growth respectively) depend directly on the way these property rights are determined, especially as far the ownership between the private and the public sector is concerned⁴⁵. In the long run, economic growth is based upon the successful choice of economic institutions that make transactions easier and less costly over long periods of time.

We have attempted to apply this analytical frame to the early period of commercial capitalism. When Elizabethan England faced the Spanish threat of invasion, the particular choice of the public's good defense in the form of a permanent navy, and the creation of a strong fleet helped both to confront the enemy and to obtain naval supremacy. Once this supremacy was obtained, England tried to expand its commercial activities to overcome Dutch hegemony in the seas during the 17th century. The creation of broadly based joint-stock companies aimed at solving the complex problem of organizing and financing big overseas privateering-commercial expeditions. The size of necessary funds was so great, that neither the public nor the private sector alone had the necessary mix of skills and amount of resources to solve it by itself alone. So, these expeditions based on a large «alliance of interests» led to the establishment of a stable legal framework of property rights and political institutions. Since the Anglo-Spanish war lasted for forty years, this choice had the character of a continuous repeated game, so that the «alliance of interests» could be tested again and again, be refined and become permanent, stabilizing furthermore the legal framework and finally leading to «institutional path dependence».

Elizabethan England gave an ingenious solution to the distribution of costs and benefits of the public good defense: those benefiting the most from it, were bearing the heaviest burden. Naval and commercial circles were called to offer their personal capital and labor for the creation and maintenance of sea power. But England went a step further: It transformed war into a self financing commercial private enterprise, with profit as its main incentive, where the question as to who would bear the costs and get the benefits was automatically solved through the creation of joint-stock trade companies. These companies supported England's commerce during the period starting in the early 1600's, and contributed significantly to its future economic growth. Ocean-shipping efficiency grew rapidly after 1600 because of the «decline of piracy and privateering and the development of markets and international trade»⁴⁶. Elizabethan England is an exemplar case of successful organization and institutional change generated by singular historical circumstances that became «locked-in» into a single growth path⁴⁷.

Notes

1. Rodger N.A.M., *The Safeguard of the Sea*, (London: Harper & Collins 1997).

2. Spooner F.C., «The Economy of Europe 1559-1609», in R.B. Wernham ed. *The New Cambridge Modern History*, vol. III. (Cambridge: Cambridge U.P., 1990).

3. Kennedy P., *The Rise and Fall of the Great Powers*, (Unwin and Hyman 1988).

4. The galleys, being propelled by oars, necessitated big crews and so were dependent on replenishment of water and food at frequent intervals. Furthermore the «mechanics» of oar propulsion necessitated low boards over the sea's surface, which were inadequate against the heavy seas of the Atlantic.

5. Lewis M., *The Spanish Armada*, (Pan, 1960), maintained that English guns had smaller calibers but superior range, a view contested by Rodger *The Safeguard of the Sea*, and Konstam, A. *The Armada Campaign 1588*, (Oxford: Osprey Publishing Co., 2001).

6. These being that iron melts at a much higher level of temperature than bronze, making it thus much more difficult to achieve high quality without shortcomings. It weighed about one fifth more than bronze and became corrugated by gunpowder. A bronze gun that received an over close of powder discharge dilates and cracks, but an iron gun just explodes without further warning. Thus, iron guns were more dangerous to their own crews.

7. Davies C.S.L., *Supply Services of the English Armed Forces*, Oxford, Ph. D. Thesis, (1963).

8. Other examples of this are radar technology, airplane turbines, missile propulsion, computers and atomic energy developed during the second World War for military purposes, and satellites, laser, new composite metals and synthetics developed during the Cold War period. For a critical appraisal of the positive economic effects of war, see Nef J.U., «The impact of war on science and technology», in *4th International Conference of Economic History*, Bloomington 1968, (Paris: Mouton 1973).

9. Cipolla C., *Before the industrial revolution*, (New York, W. Norton & Co. 1980).

10. Schubert H.R., *History of the British Steel Industry from 450 B.C. to AD 1775*, (London, 1957). Cleere H. - Crossley D., *The Iron Industry of the Weald*, (Leicester 1985).

11. Tincey J., *The Armada Campaign 1588*, (Osprey Elite, No 15. 1988), Thompson I.A.A., *War and Government in Habsburg Spain 1560-1620*, (London 1976).

12. 7,667 sailors and 20,459 soldiers manned the Armada. Before his death, the Admiral, Marquis De Santa Cruz estimated that England's con-

quest would necessitate an expeditionary force of 55,000 foot and 1,200 cavalry, to be embarked in 520 sailing and 89 oared vessels for a total cost of 2,589,519 ducats. Phillip found this unachievable and thus selected the option of embarking Parma's army. A propos: Fuller J.F.C., *The Decisive Battles of the Western World*, (Paladium 1970), Rodger N., *op. cit.*, Konstam, *op. cit.*

13. The Armada consisted of 107 big ships, plus 34 smaller ones of less than 100 tons. In total, only 4 big ships were lost from various causes during the Channel naval fights; the rest had sunk in storms. See Konstam, *The Armada Campaign*.

14. Konstam, *op. cit.*

15. Rodger, *op. cit.*

16. The mainly agricultural regions supported the king, while the seaboard «naval» cities and counties, as well as the commercial and «industrial» ones, where sailors, workers, merchants and industrialists predominated, and London -where in addition to the above «classes» there existed also the «bankers» and financiers- sided with Parliament. See Wernham R.B. «The English Question 1559-1569», in Wernham R. (ed.), *The New Cambridge Modern History*, (Cambridge U.P. 1990), vol. III. Weingast, B.R. «The Political Foundations of Limited Government: Parliament and Sovereign Debt in 17th and 18th Century England», in J. Drobak & J. Nye (eds), *The Frontiers of New Institutional Economics*, (San Diego: Academic Press 1997).

17. Glete, J. *Navies and Nations, Warships, Navies and State Building in Europe and America, 1500-1860*, (Stockholm: Coronet Books 1993).

18. Kennedy P., *op. cit.*

19. Lynch J., (1964), (1969), *Spain Under the Habsburgs*, 2 vols, Oxford. Braudel, F., *Civilisation materielle, economie et capitalisme XV-XVIII siècle*, vol III, (Paris: Livre de Poche, 1993).

20. Braudel F., *op. cit.*

21. Koenigsberger H.G., «Western Europe and the Power of Spain», in R.B. Wernham (ed.), *The New Cambridge Modern History*, vol. III. (Cambridge Univ. Press 1990).

22. Braudel F., *La Mediterranee et le monde mediterraneen a l' epoque de Philippe II*, vol. I, (Paris: Armand Colin, 1990).

23. It is nowadays largely accepted that they were both partly right. Cf. Schumpeter J.A.S, *History of Economic Analysis*, (N.Y. Allen & Unwin 1954), pp.311-2; Spooner, *op. cit.*, p. 18.

24. Quoted in Rodger (1997). We have here a striking analogy with the emergence of another naval power, Athens in the 5th century B.C. As soon as the Democratic leader, Themistocles came to power, he introduced his «Naval Law», that enabled Athens to build during 482-481 BC 200 triremes, the fleet that won the sea battle against the Persians in Salamis, 480 BC. See Kyriazis N. - Zouboulakis M., «Democracy, Sea Power and Institutional Change: An Economic Analysis of the Athenian Naval Law», *European Journal of Law and Economics*, 17 (1), 2004.

25. Davies, C.S.L., *op. cit.*
26. Henry VIII's expenditure during 1542-1547 for the navy reached 265,000 pounds out of a yearly revenue of about 250,000. Queen Mary spend 21,000 pounds per year for the Navy, and Elizabeth 16,000 per year for the period 1565-1574, or 6.5% of total «normal» revenues (Rodger 1997). We can compare this percentage with the defense expenditure (total, not just Navy) between 4-6% of GDP for Greece during 1990-2000, 2-2.5% for the EU countries average and 3-3.5% for the USA for the same period.
27. Wallerstein I., *The Modern World System II: Mercantilism and the Consolidation of the European World Economy*, (San Diego: Academic Press 1980), North D.C., *Structure and Change in Economic History*, (London: W.W. Norton & Co. 1981), Kennedy, *op. cit.*
28. Houmanides L., *Economic History of Europe*, (Athens: Papazizis, 1991, in Greek).
29. North D.C., *op. cit.*
30. Kennedy, *op. cit.*
31. After the discovery and exportation of gas by the Netherlands, this has lead to an appreciation of the Dutch currency, thus making all Dutch exports more expensive and less competitive.
32. Braudel F., *op. cit.*, vol. III, p.438.
33. Rodger N., *op. cit.*
34. Konstam A., *Elizabethan Sea Dogs: 1560-1605*, (Oxford: Osprey Publishing Co., 2000).
35. Andrews K.R., *Elizabethan Privateering*, (Cambridge: CUP, 1964).
36. Andrews K.R., *The Spanish Caribbean: Trade and Plunder 1530-1630*, (New Haven, 1978); *Trade, Plunder and Settlement: Maritime Enterprise and the Genesis of the British Empire 1480-1630*, (Cambridge, 1984).
37. Nowadays the issue of PPP in National Defense gains again momentum as in the field of communication and imagery satellites. For example the new British system due to enter into service in 2005 is SKYNET 5, which combines frequencies for civilian and military use, as will be the case also for the Greek Satellite Hellasat, while civilian imagery satellites like Landsat, Spot and Iconos are used also for military purposes, such as mapping.
38. Rodger N., *op. cit.* The last phrase has been attributed to sir Walter Raleigh, England's famous corsair and admiral, who among others organized the first unsuccessful English attempt at settlement in America, in 1589, leaving behind for posterity the name «Virginia» for the region, to honor the «virgin queen» Elizabeth.
39. North D.C. - B.R. Weingast, «Constitutions and Commitment: The Evolution of Institutions Governing Public Choice in 17th Century England», *Journal of Economic History*, vol. 59, 1989, pp. 803-832.
40. North and Weingast in «Constitutions and Commitment» speak about «future's long hand». Such is the incentive a king or sovereign has to obser-

ve his dues and obligations as for example paying back his debts. If he does not do this, he loses credibility and in the future he will find nobody to grant him a loan. A counterincentive may be the sovereign's time preference. If he values his present needs much higher than his future ones, then he may not observe his future obligations, because the present gain of non-observance may be higher than the future loss due to loss of credibility. See Buchanan J. - Brennan G., *Reason of Rules*, (Cambridge: Cambridge UP, 1981), Weingast B.R., «The Political Foundations of Limited Government». The same topic is being analyzed from an ethics and economic efficiency standpoint in Klundert T. van Der, «Economic Efficiency and Ethics», *De Economist*, (1999), No 2.

41. Samuels W.J. (1999), «Theories of Property», *Journal of Economic Issues*, vol. 33, pp. 183-8.

42. Schumpeter J.A.S., *History of Economic Analysis*, p.342.

43. Cameron R. (1989), *A Concise Economic History of the World*, Oxford University Press.

44. Among the huge transaction costs literature, see Coase R., «The Problem of Social Cost», *Journal of Law and Economics*, (1960) vol. 3, pp. 1-44. Coase R., (1992), «The Institutional Structure of Production», *American Economic Review*, vol. 82, pp. 713-719, Williamson O.E., *The Economic Institutions of Capitalism: Firms, Markets, Relational Contracting*, (New York: The Free Press, 1985), North D.C., «Structure and Performance: The Task of Economic History», *Journal of Economic Literature*, vol.16, (1978), pp. 963-978, North, «Transaction Costs, Institutions and Economic History», *Journal of Theoretical and Institutional Economics*, vol. 140, (1984), pp.7-17; North, *Institutions, Institutional Change and Economic Performance*, (Cambridge University Press, 1990); North D.C., «Economic Performance Through Time», *The American Economic Review*, vol.84, (1994), pp. 359-68.

45. Alchian A. - Demsetz H., «The Property Rights Paradigm», *Journal of Economic History*, Vol. 33, (1973), pp.16-27.

46. North D.C., «Sources of Productivity in Ocean Shipping, 1600-1850», *Journal of Political Economy*, vol. 76, (1968), pp. 953-970. In a more recent study, North (1991) adds that long distance commerce conducted to a series of economic institutional innovations that increased capital mobility, reduced the cost of information and distributed risk more evenly, thus reducing uncertainty.

47. On the meaning of «path dependence», see David P.A., «Clio and the Economics of QWERTY», *The American Economic Review*, vol. 75 (2: 1985), pp. 332-7; Arthur B.W. (1989), «Competing Technologies, Increasing Returns and Lock-In by Historical Events», *Economic Journal*, Vol. 99 (1, 1989), pp.116-131; David, «Why are Institutions the “carriers of history”? Path dependence and the evolution of conventions, organizations and institutions», *Structural Change and Economic Dynamics*, vol. 5, (2, 1994), pp. 205-220.