

# IN SEARCH OF THE ETERNAL COIN: A LONG FINANCE VIEW OF HISTORY

DR MALCOLM COOPER



LONG  
FINANCE

ETERNAL BREVITY | 1-02010

## Long Finance – Eternal Brevity 1-02010

Established in 2007 by Z/Yen Group in conjunction with Gresham College, the Long Finance initiative began with a conundrum – “when would we know our financial system is working?”. Long Finance aims to “improve society’s understanding and use of finance over the long-term”, in contrast to the short-termism that defines today’s financial and economic views. Long Finance is a community which can be explored and joined at [www.longfinance.net](http://www.longfinance.net).

Long Finance publishes occasional Eternal Brevity notes in order to initiate discussion on an idea of some originality that is pertinent to a long-term view of commerce. Eternal Brevities allow authors to explore and share new ideas without feeling that intensive research or consensus is needed beforehand.

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# PREFACE

George Santayana said, “those who cannot learn from history are doomed to repeat it”. Malcolm Cooper’s *Eternal Brevity* paper is the sort of history from which we can all learn. Malcolm presents both a long finance view of history and a history of value to help us grapple with a thought experiment – can we find an eternal coin? His is an awe-inspiring journey through ancient civilisations of Egypt, Mesopotamia and China, through Carthage and Rome, onwards to England in the Middle Ages, and through the industrial revolution to land in today’s global information age. He observes the eternal coin changing substance subtly through these ages, yet many characteristics remain consistent. Malcolm Cooper is one of those rare and valuable historians who maintain our interest, even on subjects and periods about which we might know and care little; this paper entertains throughout, yet all the while sticks relentlessly to its challenging purpose, the search for the illusive eternal coin.

The thinker, Étienne Gilson, said, “history is the only laboratory we have in which to test the consequences of thought”. Malcolm concludes his superb history paper with a selection of topics and mouth-watering questions for the future that result from his historical thought experiment. Malcolm Cooper’s paper isn’t providing the answers (if only!) but it is certainly honing some darned good questions for us to test in the Long Finance laboratory. This paper is a wonderful launch pad for our eternal coin debate.



**Ian Harris**

Managing Director  
Z/Yen Group Limited

# FOREWORD

**Long Finance aims to “improve society’s understanding and use of finance over the long-term”, in contrast to the short-termism that defines today’s financial and economic views. Our goal is to develop a Long Finance movement that submits challenging ideas and options to rigorous analysis and vigorous debate. Along the way we hope to have some intellectual fun.**

Our iconic project for Long Finance is a thought experiment, the Eternal Coin. Our objective is to start a global debate about society’s values over the long-term. John Kenneth Galbraith remarked: “There can be few fields of human endeavor in which history counts for so little as in the world of finance”. Malcolm attempts to make financial history count today. For us, Malcolm Cooper’s excellent historical survey is a wonderful base from which to begin the first of our Eternal Brevity explorations.

We are extremely grateful to Alpheus for funding the first of our Eternal Brevities and providing support for subsequent discussion.



**Professor Michael Mainelli**

Executive Chairman  
Z/Yen Group Limited

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# **IN SEARCH OF THE ETERNAL COIN: A LONG FINANCE VIEW OF HISTORY**

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# ABOUT THE AUTHOR

## Dr Malcolm Cooper

Official Historian, Long Finance

**Malcolm is an historian by training, and prides himself on being a jack of almost all trades and a master of some.**

He holds a First Class Bachelor of Arts in History from Dalhousie University, a Master of Arts in History from the University of Western Ontario, and a Doctorate of Philosophy in Modern History from Oxford University. His thesis on the formation of the Royal Air Force was subsequently developed into a book, *The Birth of Independent Air Power*, and published in 1986. His career has included a Research Fellowship at Downing College, Cambridge, management of the research programme of the Institute of Chartered Accountants in England and Wales, equity research management with three different investment banks (none of which, alas, exist today under their original name), and a five year spell as Head of Research for the City of London Corporation. His most recent post was as Head of research for the independent public policy think tank Centre for Cities.

Malcolm was the first foreigner to take up coverage of the Istanbul and Athens stock markets and spent most of his investment banking career in European emerging markets, his last post being as Head of EMEA Equity Research for ABN-AMRO (a job he gave up in 2000 – not because he could see the dot.com crash coming, but because he decided he really didn't want to be on the Central Line at 6.30 in the morning any

more). Most of his recent work has been in the UK public policy field but he retains an active interest in the more challenging parts of the world, and is still inordinately proud of having a letter published in *The Times* pointing out some of the more obvious problems with the UK's current military commitments in Afghanistan. He has also published several pieces on Turkey, including an article in *International Affairs*, a written submission to the Commons Select Committee and a contribution to a Chatham House forecast of likely regional scenarios following the second Iraq war.

Malcolm commissioned and worked with Z/Yen on the Global Financial Centres Index, and has since written several pieces on the impact of the recession on financial services employment in the UK. He is involved in both the London Accord and Long Finance initiatives. He is particularly interested in water-driven alternative energy sources, and in using history to develop a longer long view of financial markets.

Malcolm's major hobbies are maritime and naval history, on which he is an active researcher and writer, and chess (which he plays rather badly). He is also particularly interested in developing business and economic relationships with China – not least because his wife and step-daughter represent part of that country's intellectual contribution to Britain's increasingly diverse culture.

# AN EXPERIMENT WITH TIME AND SPACE

*“Money makes sense in a language all nations understand.”*

Aphra Behn – *The Rover*, Part II (1681)

In an age of e-commerce and electronic trading, when even the smallest transaction can be carried out with a credit card, a computer or any range of digital devices, it might seem more sensible to ask whether currency will disappear altogether than to construct a conceptual eternal coin. That, however, is exactly what this paper seeks to do. The coin in question is a virtual one, a representation of value, wealth and exchange, tracked over time. The basic premise is that societies have always functioned around goods, resources, objects and services that can be used to sustain life, achieve economic growth, reach political targets, or simply improve human happiness. For long periods of history this basket of assets has been at least partially represented by real currency, either metallic coins with an intrinsic value of their own, or paper currency backed up by other assets. At other times, however, currency has been scarce or non-existent. What has been present in each society is a broader measure of aspirational value and wealth – something that can be exchanged across space and through time to achieve whatever goals the society in question sought to achieve. This is our eternal coin.

The eternal coin is thus a thought experiment that speculates on whether a coin that never loses value could exist, and, if such a coin could exist, how it might be constructed. Value is, of course, intrinsically tied to what the coin would exchange for in the future. Therefore an eternal coin would be a call on future wealth. Its composition could range from physical materials such as precious metals to a digital representation. Its construction would include the mechanisms for managing the coin's value, which could be completely free of human intervention at one end of the spectrum or move through a spectrum of management mechanisms such as controlling the supply of currency or creating a structure to make the coin redeemable against one or more of a basket of goods.

The history of the eternal coin has been decidedly diverse and erratic – in the pre-global era regional differences could be profound, and over the centuries

the coin of any particular era has often mutated in the most profound fashion due to changing economic, political or social circumstances. This paper will explore the eternal coin through a sample of civilizations across time and space, seek to draw broad conclusions on how its composition has evolved, and conclude by returning to the question alluded to in the opening sentence – what will the eternal coin of the future look like? We will not attempt to cover the entire sweep of human history, but will rather focus on periods when civilizations were experiencing profound political, economic and social changes – changes which, in our thought experiment, produced significant changes in the composition of our eternal coin.

Before beginning our journey through time, it is necessary to develop a broad idea of how the eternal coin is constructed. The base material is net economic output, broken down into its major physical and invisible trade elements. Net output can broadly be defined as the total value of goods and services produced, less the cost of producing them. The coin, however, is much more than a basket of goods and services. It is necessary to factor in the manner in which these latter were produced. This involves looking at political and social structures as well as economic ones. This we will find is a critical part of the process. While we are all familiar with the profound changes in economic output produced by periods of rapid technological change such as the Industrial Revolution, shifts in social aspirations and political objectives have often produced equally important transformations. In addition, much of the energy consumed in producing wealth in the pre-industrial age was supplied by human labour, and the manner in which this was harnessed is an important component of our eternal coin. Finally, and critically, it is necessary to look at what drove the whole process. What vision of the future underpinned the eternal coin? Here we will find variations at their most profound, ranging from simple subsistence through visions of many different measures of growth to the pursuit of the eternal itself.

# OZYMANDIAS?

*“Supreme over other kings, lordly in appearance,  
he is the hero, born of Uruk, the goring wild bull.  
He walks out in front, the leader,  
and walks at the rear, trusted by his companions.  
Mighty net, protector of his people,  
raging flood-wave who destroys even walls of stone!”*

The Epic of Gilgamesh

We first step into the time tunnel to look at the first great civilizations of the two millennia BC – those of Egypt, Mesopotamia and China. Our sweep here is far broader than at any other time in the paper and our focus less precise for the same reason – the relative sparseness of the evidence base. We are dealing in a mixture of archaeological finds, some often fragmentary contemporary written records and the writings of near contemporary historians who pursued a far less sceptical trade than their modern-day successors. The biggest problem is really not what we know but what we don't know – it cannot be quantified, and new archaeological discoveries could lead to complete re-interpretations of the past and hence of our eternal coin. This is particularly the case in China. While the known remains of ancient Egypt have been relatively well explored, and those of Mesopotamia have been rendered largely inaccessible by modern conflict, those of China continue to open up. They are spread over a far larger area and have been left undisturbed through the years to a far greater extent than the pillaged tombs of Pharaohs or the razed palaces of Middle Eastern monarchs. The eternal coin of a Shang or Zhou king is far more likely to be subject to future review than that of Tutankhamun or Hammurabi.

It would be possible to write pages on the differences between the early Egyptian, Babylonian and Chinese civilizations. What is interesting for the purposes of this paper are the similarities. All were agrarian economies – indeed all emerged as dominant civilizations because strong central authority was able to create the infrastructure and the compulsion to raise agricultural output from subsistence level to a point where it could provide a surplus to support an expansionist state. In the case of Egypt and

Mesopotamia this involved the exploitation of the Nile, Tigris and Euphrates. In the case of China, it involved an early drive south from the less fruitful and far colder climes of the northern part of the country to the Yellow River; and then, right at the end of our period, the extraordinary conquest of the vast cereal bowl of Sichuan to the west by the newly arrived Qin dynasty, who reached their target through the mountains of Qingling range by building a road in the late 4th century BC which deserves to be recognized as one of the civil engineering masterpieces of the ancient world.

The states themselves were highly autocratic and expansionist, and it is no accident that older histories of them are largely those of wars. The position of the ruler as an absolute monarch and the maintenance of large military forces are very important to the construction of our eternal coin. The rulers supported



their positions with legal codes, of which that of Hammurabi, dating from roughly 1790 BC is the earliest and most famous (and also probably the most bloodthirsty). They employed large numbers of scribes both to administer their kingdoms, and, equally important, record and legitimize their deeds. We have an early echo here of the value of information as a means of control and exchange over space. As the administrators and artists of the pharaohs laboured over their papyrus, so too did the administrators of the Shang and the Zhou over their inscribed shells and bones, their bronzes, and finally their bamboo strips. The objectives were not purely administrative. The past itself has always been a powerful tool for shaping the present. Bronze Age rulers were re-writing history themselves to glorify their achievements and arrange the past in a manner best suited to supporting their power long before independent historians got involved in the act.

The position of the population at large, however, is equally important. The creation of food supplies and the completion of huge building projects were basically the product of the mass mobilization of human labour. The exact legal status of the Egyptian labourer or the Chinese farmer can be vague – some were undoubtedly slaves, others day workers paid on a subsistence basis only marginally different from slavery, some were peasants working in a proto-feudal system, and a very small minority would be skilled craftsmen paid in some way to ply their trade. The important point is that human labour was the most important input into basic net output. It was also important because the need to harness more of it was one of the driving influences behind the expansionism of the early civilizations. Whether they used slaves on a mass scale, or simply expanded their political control through conquest, early civilizations grew by expanding a human-powered agricultural production base.

If we turn to the creation of physical assets of intrinsic value we get an insight into another important component of the early eternal coin. Coinage itself did make an uncertain debut during the period. Traditionally, the first coins were minted by the Lydians, one of a host of shadowy peoples to make their way across the crowded stage of the history of Asia Minor in the late 7th century BC, from electrum an alloy of gold and silver. There is considerable evidence, however, that coins had appeared in China

hundreds of years earlier, and there were other rivals to the Lydians elsewhere in their own region. The coins themselves, however, are something of a blind alley. There is little evidence of coinage becoming the basis of trade or the measure of wealth at this stage. Most trade appears to have been barter, most taxes were paid in kind, and critically for this essay, precious metals were used for other purposes than buying and selling. The most important of these metals, indeed the one to lend its name to the entire Age was bronze, an alloy of copper and tin. Bronze made an early appearance in the fourth millennium BC but it was only in the second that bronze began to be produced in sizeable quantities. Bronze's immediate utility was military, and bronze arms and armour played a key role in the expansion of the great empires of the time. In China, however, bronze appears to have been created on a far greater scale than in the Middle East, and while the armies got their spears and their helmets, the bulk of production went elsewhere.

In China, bronze became the ritualistic medium for demonstrating wealth and status. Most production went into the creation of vast udder-like vessels on tripod bases, the ornamentation of which became more and more intricate as the complicated skills of moulding developed. It is impossible to put numbers to it, but bronze casting was clearly a large industry in its own right. The vessels themselves could be huge – single pieces weighing close to three quarters of a tonne have been excavated. These were clearly not trade goods and their immediate purpose was to meet the needs of the ruling elite. In the lifetimes of kings and their families these needs may have served ritualistic purposes beyond the simple desire to demonstrate status, wealth and power. It is in the afterlife, however, that they find their true place in our eternal coin. The vessels followed their owners into their tombs, in some cases on a massive scale. The total bronze component of one fifth century BC tomb at Sizhou totalled 10 tonnes. A fairly small tomb of a Shang princess at Anyang, dating from about 1200 BC included 195 bronze vessels, the largest weighing 265 pounds, and 271 smaller bronze pieces. The tomb also held a collection of 755 objects of carved jade, the largest ever found. Chinese tombs are only coming to light gradually as they are often hidden under burial mounds rather than monuments. They could, however, be huge. The largest of the complex of tombs at Anyang is roughly the size of a football pitch.

By now a bell should be ringing very loudly, and readers should be thinking of Ancient Egypt. The Pyramids are the most enduring image of ancient Egypt, and this is exactly what their builders intended them to be. The most famous treasure-find of the modern era is that of the boy pharaoh Tutankhamun, a treasure trove which was probably far smaller than those buried with some of his longer-lived and more illustrious ancestors, which simply survived to the present day because it was not placed under a massive edifice where tomb robbers would find it when there were no longer guards at the entrance. The Pyramids were Egypt's equivalent of China's great bronzes. The largest, that of Khufu, was constructed over a 20 year period ending somewhere around 2550 BC. It has a total mass of roughly 5.9 million tonnes, and it has been calculated that building it could have involved moving as much as 800 tonnes of stone a day. While slave labour was probably involved in basic quarrying and transportation, it is now accepted that the pyramid was built by a trained workforce of paid craftsman who lived in a semi-permanent settlement at the site. Their number is a matter of intelligent guesswork, but the figure must certainly have been in the many tens of thousands.

What binds Chinese bronzes and Egyptian pyramids together is a belief in the afterlife which is critical to casting our first eternal coin. The ruling elites of the first great civilizations accumulated precious objects and built massive edifices so that they could take their wealth with them into the next world. They sometimes took people too, either literally by having their servants buried with them, or figuratively by creating their likenesses. In the latter case, this could quite literally include armies such as the 8,000 terracotta warriors of the first Qin Emperor Qin Hua Shiang. Thus it could probably be said that long finance in the early world was longer than it was at any other time. Wealth was accumulated and huge segments of the economy were mobilized to ensure that the elite went into eternity with all the trappings, status and protection of their earthy power. The eternal coin was based heavily on the creation of an arable surplus and the mass exploitation of human labour; it incorporated the fruits of conquest by armies funded by the rural economy and was underpinned by legal systems supporting the lineage and legitimacy of the elite; it found its physical manifestation in massive stone edifices and huge

collections of precious objects; and its ultimate exchange value through time was the continued power and prestige of the elite in the next world.

The first great civilizations left one other legacy beyond monuments and collections of objects – the concentration of population, power and economic activity into cities. Paradoxically, most of the actual cities of the Bronze Age have left behind very little to hint at their greatness. All that is left of Babylon is a mound of debris in the desert, while the site of the Egyptian capital of Memphis holds little more than the remains of two temples and some statues. The location of not a few ancient cities is still a matter of debate, and subject to ongoing archaeological revision. Estimates of the populations of these cities vary enormously – those for Memphis, for example, range from 6,000 to 30,000, and most are as much guesswork as science. One of the problems with cities through most of human history was that their wealth and their status as seats of power were magnets to invaders. By the middle of the first millennium BC, however, cities were being established which, however battered and bruised, would stand the test of time. Ancient Athens, for example, had been founded by the end of the 6th century BC. The history of the following 1,000 years, however, would be dominated by another survivor – Rome, often dubbed “the Eternal City”, in its prime far more than just that.

# SENATUS POPULUSQUE ROMANUS

*“Wherever the Roman conquers, there he dwells.”*

Lucius Annaeus Seneca – Moral Essays

*“The People that once bestowed commands, consulships, legions, and all else, now concerns itself no more, and longs eagerly for just two things – bread and circuses!”*

Decimus Junius Juvenal – Satires

We now move to what was undoubtedly the greatest civilization of the pre-modern world, Ancient Rome. Our starting point is the middle of the third century BC (roughly at the same time as the first Qin emperor – he of terracotta warrior fame – came to power in China). By this time, three critical changes had occurred which were transforming our eternal coin. First, Rome was an oligarchic republic with an elaborate system of political checks and balances in place to ensure that it could not revert to any form of monarchy. Second, trade in high value, low bulk goods had become international, largely as a result of technical developments in ship design and scientific advances in navigation. Finally, precious metals had become recognized instruments of exchange, and were not simply used to create symbols of power or funerary finery. The process of transformation is best understood through an analysis of the Punic Wars – a century-long struggle between Rome and Carthage, another oligarchic republic which had grown up in what is now Tunisia as a result of colonization in the 9th century BC by the Phoenicians, a maritime trading people who had originated in Tyre in the Eastern Mediterranean.

Rome and Carthage shared very little beyond the basic principles of their political systems. Rome had expanded by conquest and annexation to control the entire Italian peninsula south of the River Po. Its power was based on a large standing army made up of its own citizens. Carthage began the period controlling only its North African hinterland. Carthage’s army was largely mercenary but its trading power was protected by a large professional navy crewed largely by its citizens. Carthage enjoyed an almost complete monopoly on trade in the Western Mediterranean, and also through this

controlled the supply of most luxury goods. Its fleet traded as far afield as Britain and the Canary Islands and was probably equivalent in size to the merchant marine of 18th century France or Britain. Carthage enjoyed a monopoly on the supply of tin, the critical ingredient in the manufacture of bronze, it was the Mediterranean’s largest supplier of silver – one mine in Spain was said to provide it with the 300 pounds (the equivalent of 3.75 Roman talents) a day, and it had inherited from its ancestors the art of producing the dye Tyrian Purple – the most prized dye of the Mediterranean world generally worth 15 to 20 times its weight in gold. Beyond these market leaders, the Carthaginians brokered trade in everything from alabaster to salted Atlantic fish around the entire Mediterranean littoral, and supplemented their economic output with the products of the most technologically advanced agricultural system of the age (the coastal areas of North Africa were highly



fertile and nothing like the deserts of today). One of the most interesting aspects of the Carthaginian economy as a whole is it was not based on currency. Carthage minted no coins (although a semi-autonomous colony in Spain did so in considerable quantities during its brief lifetime); its trade was based on barter.

A collision between an expansionary Rome and a monopolist Carthage was inevitable. War began in 264BC as a result of both sides being pulled into a war between two small city states in Sicily, but it rapidly escalated into an all-out struggle for hegemony. This is not the place for a full history of the war. The key elements, however, were that the Carthaginians rapidly discovered they could not stand up to the Romans on land, and the Romans that they could not match the Carthaginians at sea. Rome won the war because it found a solution to its naval weakness by mounting a boarding ramp (known as a *Corvus*) on its vessels to allow its soldiers to board and capture their enemies. After a string of defeats, Carthage sued for peace in 261BC, evacuated Sicily and paid a large indemnity. The critical outcome was less that Rome now controlled Sicily than that Carthage's trading strength was no longer backed up by maritime might.

A prolonged bout of domestic instability delayed a response, but Rome's opportunistic seizure of the former Carthaginian colonies of Sardinia and Corsica prompted Carthage to guarantee its sources of wealth on the Iberian peninsula by invading and establishing a large colony of its own. By this time it was clear that the two powers had moved beyond the limited objectives of the first conflict and were really contesting political and economic hegemony over the entire western Mediterranean. The Romans reacted to the Carthaginian move by attacking the latter's Celtic allies north of the Po. This merely triggered Hannibal's invasion of Italy beginning with his famous passage across the Alps. The Second Punic War lasted from 218BC to 201BC. Hannibal was able to defeat successive Roman armies but could not take Rome, and the Carthaginian colony in Spain was eventually lost to a Roman counterattack. Carthage was again forced to sue for peace and to pay a huge indemnity – the only reason that Rome did not destroy Carthage completely was that it had become embroiled in a new series of wars of expansion in Greece. Carthage was finally destroyed in the Third Punic War of 149-146BC which was basically a three-year siege of

Carthage culminating in the city being razed to the ground; but the real war had been won half a century earlier. From the beginning of the second century BC, the Mediterranean was Rome's *Mare Nostrum* (our sea), and the Roman Republic was on its way to becoming an economic and political empire, with Rome as the centre of both trade and political power.

So what of our eternal coin? The most obvious observation was that it had mutated into something far closer to that of the modern world than its predecessor. The key change was the development of trade and the use of commodities and precious metals as means of exchange. Behind this, net output had become much more complex, with high value luxuries and ores adding a high degree of value to the basic basket of food (which itself was now far more diverse), fuel and building materials. A combination of technology and the domestication of animals was gradually reducing the human component in the production process, but it stayed high – not least because of the mass enslavement of conquered peoples. The coin was also changing because of the development of what we normally now describe as a consumer society. As Rome expanded, its citizens followed to reap the rewards of its triumph, either through participation in an ever widening and increasingly secure foreign trade, or to take up the multitude of offices needed to administer Roman rule (offices which in an era of institutionalized corruption were often highly lucrative). Like the middle class of more recent times, these traders and officials were voracious buyers of conveniences, luxury goods and art, and diligent builders of ever grander buildings. The state added to this through a programme of public building works and even of entirely new cities – the ultimate irony of the fall of Carthage was that 100 years later Julius Caesar built a new city on the same site which, by the first century, had grown to be the second largest city in the western half of the empire.

The final major ingredient in our coin was the active element of change which had emerged from Rome itself – the Roman Army and the political structure behind it. From the time of the Punic Wars, Rome was an overtly expansionist state, and while control of the Mediterranean might have been the original objective, ambitions soon overtook this to the point where any territory with a common border was a target for aggression. The Roman army was a superior

fighting machine to anything it encountered in the centuries on either side of the start of the new millennium, and Roman generals could normally expect to earn huge wealth and prestige on campaign. These generals were appointed by the Roman senate from within its own ranks, so the connection between military operations and the state was far less a matter of grand strategy than it was of intricate domestic power politics. The ultimate irony is that the Republic, which had been created to make absolute rule impossible, became so committed to military expansion that it began to produce men whose control of armies more loyal to themselves than to the state gave them the means to seize power.

Assassination stopped Julius Caesar from enjoying absolute power, but after coming out victorious in a war with his potential rivals, his great nephew Augustus was able to reduce the institutions of the republic to largely honorific status, and to rule as emperor. His reign was dominated by wars of conquest, and each of his successors would strive to emulate him. Thus the Roman eternal coin's value through time became driven by the continued expansion of the empire itself.

While we have only touched briefly on real coins to date, and the focus of our essay is on something rather different, it is worth touching on three aspects of Roman coinage. The first is that unlike most coins, Roman coins had an intrinsic value of their own – that is to say the value of the coin was higher than its precious metal (largely silver) content by a factor of something between 1.6 and 2.85. The second is that their iconography changed completely with the transition from Republic to Empire. Republican coin images normally featured a bust of the female deity Roma on one side and a variable image on the obverse alluding to some aspect of the Republic's past (such as Romulus and Remus suckling from a wolf). Julius Caesar changed all this by putting his own bust on coins and the emperors all followed suit. The coin thus became an important part of the imperial image and a means of legitimating it particularly at times of instability. Finally, the Roman coin was subject to steady debasement throughout its history. Two factors were at work here – in the first case the supply of silver did not grow quickly enough to keep pace with the economy; in the second, the state was often spending more than it could afford, although it is impossible to be precise about the extent of such inflationary policies.

The interesting thing from the point of view of this paper is that the Roman virtual coin could also be said to have started suffering from debasement as the empire outreached its strength. Our eternal coin was based on a future of ongoing expansion, on an all-conquering army, on a massive secure trade network and a shared vision of the greatness of Rome. These all began to crumble. It is not possible to put a date on the point of inflection, but Rome was basically on the defensive when Hadrian began his wall in 122, and its wars with neighbours in central Europe and the Middle East had already begun to produce major defeats as well as occasional triumphs. The Roman army began to make heavier and heavier use of mercenaries until in its last century it was really forming alliances with old enemies to defend it against the new waves of barbarian invaders which pressed harder and harder against it. Trading markets were eroded away and became more and more vulnerable to attack, and the rules of emperors showed an increasing tendency to be nasty, brutish and short (there were 25 of them between 235 and 284), with an increasingly unstable army being the real arbiter of power. Diocletian, who brought a temporary end to this chaos when he came to power in 284, decided that the empire was simply too big and under too much pressure to be ruled by one man, and split it into two. The Eastern Empire survived a torrid start to become the Byzantine Empire. The eternal coin of Rome, which remained capital of the Western Empire, had, however, slipped away through space and time before Rome itself suffered its final "fall" in 476. The city was already a ruin, having been sacked by the Visigoths in 410 and the Vandals in 455. All that actually happened in 476 is that the Germanic mercenaries of the then "Roman" army revolted after being refused a request for lands in Italy and overthrew the emperor Romulus Augustus. He and most of his predecessors for the previous century had been figureheads supported by military strongmen. In 476 the title had become so meaningless that nobody bothered appointing somebody else in his place.

# DOMESDAY

*“...there was no single hide nor a yard of land, nor indeed one ox nor one cow nor one pig which was there left out: and all these records were brought to him afterwards.”*

The Anglo-Saxon Chronicler on the Domesday Book

*“Man proposes, but God disposes.”*

Thomas a Kempis – The Imitation of Christ

For our next experiment in eternal coin construction we move to England in 1085. The reason for choosing time and place so precisely is the existence of a unique document, the Domesday Book. Commissioned by William the Conqueror in December of that year and ready in draft form by the following August it is an economic audit of most of the kingdom of England, containing records for 13,418 settlements south of the Rivers Tees and Ribble (the contemporary border with Scotland). What makes Domesday so useful for our purposes is not just the extent and detail of its coverage, but its choice of which things it measured (and which it did not), and how these measurements were calibrated. Before looking at the Domesday Book in any detail it is necessary to look at the political system which it chronicled – feudalism. The basic principles of feudalism in England were quite simple. The land was divided into manors, all of which belonged to the

King. William kept a significant proportion for himself and his family (17% by the time the book was drawn up), made large grants to the church, and leased the rest out to his major followers (lords or barons). The lease of land was made in return for an oath of loyalty, a rent based on the output of the lands in question, the obligation to provide a pre-established number of knights for the royal army when the King called for them, and another obligation to provide food and lodging for the king and his court as they moved around the country. The Lords in turn kept a portion of land for their own direct use and leased the remainder out to knights in return for the obligation to answer the Lord's call either to meet his military commitment to the King or to protect the Lord himself. The Knights in turn assigned their land to villeins (or serfs) who had to provide their master with free food, labour or other service whenever it was asked for. Villeins had no rights – they were not allowed to leave their manor and even had to ask their master's permission to marry. In practice this meant that the bulk of the population lived at subsistence levels with all surpluses being re-distributed up the social scale.

There are some gaps in coverage (partially because William himself died before it was completed), including cities such as London and Winchester, but otherwise the coverage is extremely detailed, listing arable and pastoral land, woodlands and wasteland, livestock, mills and weirs on major rivers, and fishponds. Some 35% of the total covered was arable with its value measured in terms of the number of ploughs (a team of eight oxen) it could support – the number of ploughs per square mile varied considerably in line with the fertility of the soil ranging from at least four per square mile to only one



for two square miles. The land was largely used to produce cereal crops and the Domesday Book lists more than 6,000 water-powered mills for grinding grain. Another 25% of the land was accounted for by pasture and meadow – here the concept of measurement was the same but the unit varied: in Essex assessment was in terms of the number of sheep that could be supported, while in parts of Surrey and Sussex it was the number of pigs. Woodland accounted for 15% of the total and the residual 25% was heath, moor, fen or land left devastated by the Conqueror's suppression of the last resistance to his rule (largely in the north and southwest of the country). The Domesday Book often mentions specific numbers of animals (1,600 sheep at Puddletown in Dorset for example) or the yield from particular millponds (1,000 eels and 1,000 lampreys a year at Petersham in Surrey). The Book also chronicles the yield from the judicial process built into the feudal system – an extremely important component of wealth as most penalties were fines – one third of which went to the lord of the manor and two thirds to the king.

We thus have a picture of a mixed agricultural economy operating to produce a surplus for the elite. The use of animals for ploughing was widespread, but exploited human labour was still a major part of the equation. It was a largely rural economy – although the Domesday Book is not particularly useful here, we know from other sources that cities were not particularly large and that most concentrations of population would not qualify as anything more than a village. We have no real indicator of trade, although large concentrations of livestock are a sure sign that it was taking place in at least one part of the economy. In the late 11th century, however, political, social and economic structures in England (as well as in most of the rest of Western Europe) were still going through the profound transition which produced the feudal monarchies of the Middle Ages. The basic materials of our eternal coin were in place, but the coin itself was still being minted. We need to look beyond Domesday to complete the process.

The nature of the most important ingredient can be discovered by asking why William had the Book compiled in the first place. He was not looking for an audit but a tax assessment. William was facing a possible invasion from Scandinavia and was engaged in a series of wars in France. He needed to pay for a

bigger army than the existing system was providing. Medieval monarchs' need for money to finance wars was a constant theme throughout the period. The reasons for this are complex. The combination of dynastic intermarriage, high mortality rates and the semi-anarchy from which the early monarchic states had emerged tended to produce competing claims for provinces and even thrones. In addition, the value system of the elite with its emphasis on feats of arms injected a form of in-built aggression into medieval politics. A king who was not seen to be a successful military leader risked losing legitimacy in the eyes of his own nobility, who controlled most of the fighting men on whom he depended. The same dynamics played themselves out amongst the feudal nobility, the best evidence of which is the mass castle-building of the 12th and 13th centuries (there were few castles of note at the time of Domesday) – most of it undertaken by the nobility to protect themselves from each other, and sometimes the king himself. The castle was the guarantee of continued power and control for the medieval elite, and should therefore be stamped on the economic substance of the feudal economy in constructing our coin.

Something which was very strong in our Roman coin – a common identification with the state – was largely missing from its early medieval equivalent. Dynastic wars transcended nominal national boundaries – the Angevin monarchs of 12th century England, for example, were as much French as English and spent most of their time on the continent defending or attempting to expand their substantial land holdings there. Nobles, whose land holdings were often widely scattered, often held land from more than one monarch, and could appear in different armies as fortunes waxed and waned. Much of this left the bulk of the population (which in England or Scotland did not even speak the same language as its masters) untouched, and a sense of national identity was only likely in border areas where pillaging foreign armies provided a common threat against which to rally.

An equally important ingredient was the rapid increase in the status and wealth of the servants of Christianity. By the time of Domesday, bishops and abbots controlled 26% of the land in England. Although their own violent behaviour often suggested otherwise, the wealthy were very religious (or to be more cynical, very concerned for the future of

their everlasting souls). Visions of heaven and hell loomed large, and the result was that donations of land and wealth to the Catholic Church and to the monastic orders which grew alongside it were generous and ongoing. Individual bishops could be anything but real men of the cloth – they were often among the most influential politicians in the land and not above donning armour and going to war. The cathedrals they built were easily the most expensive and enduring structures of the age. Investment here was paralleled by an even more dramatic building programme of huge monastic complexes. Religious institutions received not only donations of money but very large grants of land. The result was that the church in aggregate controlled more of the economy than either the king or any grouping of the most powerful nobles. Thus our coin must reflect not only the reality of religious wealth but the fact that this wealth resulted from people investing their worldly wealth in what they hoped would be an eternity in heaven. This was the reality of exchange over time in the medieval world.

Finally, we need to look at the re-emergence of international trade. While trade had never disappeared entirely, it was fragmented and generally under-developed in the 11th century. Trade was to grow steadily through the Middle Ages. For England the bedrock of this development, and the most significant component of the eternal coin from the point of view of exchange across space, was wool. It was easily England's largest raw material export and dwarfed any other "industry" in the domestic economy. By 1300 there were probably between 15 and 18 million sheep in the country and individual flocks could be as large as 10,000 strong. Until war disrupted the business in the 13th century, wool was exported in huge quantities to be spun into cloth in Flanders and, after that trade was disrupted, a domestic cloth industry rapidly grew which allowed exporting to shift from raw materials to finished goods. The geography of the medieval wool industry can be mapped by the location of the cathedrals it helped fund. Thus we have a massive cathedral in Ely, now little more than a fen village, and other cathedrals in modest towns such as Lincoln and Salisbury. Surpluses from wool and woollen cloth also provided the revenues to fund imports, often of luxury goods from the continent, and in turn facilitated the development of east coast port cities as trading centres.

One last development that was key to the growth of trade, and in which the wool industry played an important role, was the evolution of the guild system. Guilds were societies of craftsmen plying a particular trade which required specialist knowledge – anything ranging from tanners and dyers to silversmiths and cabinet-makers. While such organizations had been fairly common in earlier civilizations, the medieval versions were far more structured and far more powerful. They grew rapidly as the medieval economy expanded and regional specializations coalesced, and gained increasing economic and political power, to the extent that they effectively ran many medieval cities. They established common standards, the apprenticeship system whereby new members were trained, and could act aggressively to defend their separate monopolies. As such, guilds mark an extremely important place in the evolution of the eternal coin – the institutionalization of knowledge and the creation of what was in effect intellectual capital. They were also of critical importance in two other areas. First they accelerated and reinforced the growth of cities as centres of production and trade, and hence of population. Second they played a vital role in the growing use of coinage as a means of exchange. While you could exchange commodities, you had to pay for a piece of craftsmanship. To put it another way, the lord of a manor could potentially exchange a surplus of grain from his fields for a supply of meat from a neighbour, but if he wanted an ornate cabinet for his chamber, he would need to ride into town with coins in his purse, not grain in a cart behind him.

In Northern Europe, the combination of increasing international trade, the guild system and the increased concentration of wealth in cities spurred the formation of politico-economic alliances which operated independently of larger monarchies. The most famous of these was the Hanseatic League (Hanse), which grew from a small trading alliance built around Lübeck in the 13th century Baltic to embrace a whole network of independent city states which operated from the shores of the English Channel through the North Sea and the Baltic up to the head of the Gulf of Finland. The League's structure was fluid, but it used its influence to negotiate trading concessions with the rulers around it. The League functioned fairly effectively as a mutual defence pact which protected the independence of its members. The emergence of stronger post-medieval states

caused the League's gradual implosion over the course of the 16th century. The League's impact on our medieval eternal coin was profound, as it created a large regional basket of cross-traded raw materials and finished goods, the main strands of which were westward flows of foodstuffs, furs and other raw materials, eastward flows of cloth and manufactured goods, and southward flows of iron ore from Scandinavia.

The growth of international banking ran parallel to the growth of international trade and created individual financial centres in cities, particularly in northern Italy. Trade and urbanization were the driving forces behind the creation of the early banking houses. Banks generally prospered as long as they stayed in the arena of trade finance, but ran into serious trouble when they took on warring medieval monarchs as clients. Monarchical clients tended to adopt a double standard in their dealings with foreign lenders – models of business rectitude while securing loans, but haughty feudal overlords in repudiating them having spent the money without earning any real return on their military investment. The banks in question were generally ruined, with the result that most institutional lending was still highly localized at the end of the 15th century.

Thus our medieval eternal coin reaches its final form – or rather it would have done if some of its original ingredients were not already changing before the newer ones were in place. One of the key contents of the medieval coin that was changing even as others were taking shape was feudalism. The concept of royal power based on an armed feudal levy was always the system's weakest link, and payment for military service was leaking its way into English armies even in the 12th and 13th centuries. The key shift in the development of what is sometimes known as bastard feudalism, was not, however, the payment of soldiers, but the provision of service, be it military, political, legal or domestic in return for money, office, influence or protection. The practice became increasingly widespread from the 14th century on with the result that the local gentry and minor aristocracy came to see themselves as men of their lord rather than their king. This was not a problem in itself if the king was strong – Henry V quashed an attempted coup and executed its two noble leaders on the way to the Agincourt campaign, and his authority was sufficiently strong that the elder brother of one of

the executed plotters died fighting in the battle at Henry's side. It was a disaster, however, if the king was weak, and was the root cause of the sporadic civil war waged between 1455 and 1485 (which we now call the War of the Roses thanks to the imaginations of William Shakespeare and Sir Walter Scott). The critical point for our eternal coin is that men looked for future worldly wealth not from their king but from a more local master.

# THE WORLD TURNED UPSIDE DOWN

*“I am the state.”*

Louis XIV of France

*“To found a great empire for the sole purpose of raising up a people of customers, may at first sight appear a project fit only for a nation of shopkeepers. It is, however, a project altogether unfit for a nation of shopkeepers; but extremely fit for a nation whose Government is influenced by shopkeepers.”*

Adam Smith – Wealth of Nations

One of the truisms of historical study is that the closer we get to the contemporary world the more we tend to know about that part of the past. It is also certainly the case that the pace of change has been accelerating in recent centuries, but we would be on very uncertain ground if we were to attempt to push the process of acceleration too far back into time. Acceptance of these generalizations is very important for our thought experiment. Our eternal coin has really been going through an ongoing process of mutation – the apparent speed and greater complexity of that mutation over the last millennium is partially a product of the fact that we simply know more about what was happening than we did in more distant ages.



This said, the number and scale of changes in political, economic and social structures from the middle of the 15th century on make it difficult to freeze frame our eternal coin at any particular point in time. It therefore seems more sensible to look at the changes themselves before constructing our last pre-industrial coin dated at some time in the first half of the 18th century. Two of the most important developments were the re-invention and re-assertion of the twin pillars of the early medieval world – the monarchy and religion – both of which had seen their power and legitimacy eroded and in some cases completely undermined in the late Middle Ages. The two processes were very different. The kings of the 16th and 17th centuries sought to build up an entirely new version of themselves as absolute monarchs accountable only to God. They did so by disarming their more mighty subjects, occasionally by force but more commonly with money and land. One of the most important components of the process was the transfer of land ownership into individual private hands – while Henry VIII’s break with Rome was the result of dynastic concerns, his subsequent dissolution of the monasteries gave him a huge land bank which he could use to reward supporters and buy loyalty. The new monarchies also spent lavishly on symbols of their own power – particularly on grand palaces. While their medieval forebears had moved from castle to castle, Henry VIII and his contemporaries built huge homes of their own – the fact that they were designed for comfort inside and display outside rather than for safety was evidence of their success in enfolding their subjects in the new order. All of this cost a great deal more money than medieval kingship.

The bill went even higher when the new kings went to war, as they now had to pay for completely professional armies – either mercenaries, or standing armies of their own. The expanding, and frequently in the red profit and loss accounts of the new monarchies had a profound impact on the real monetary system. It has a similarly dramatic effect on the composition of our eternal coin. Before we discuss this, however, we need to move on to the other major driver of institutional change – religion.

The change in the religious fabric of Europe was both violent and profound. The emergence of Protestantism and the aggressive re-assertion of Catholicism it provoked, touched the lives of the population at large rather than just the wealthy elite. While differences in religious belief had caused a considerable amount of violence in the Middle Ages, most of it took the form either of crusading in distant lands, which was largely the preserve of the nobility, or occasional pogroms against small Jewish communities. The struggle between Protestantism and Catholicism embroiled most of society, not least because one of the keystones of the former was that the word of God should be made available in the vernacular. One of the bi-products of this was a rapid acceleration in rates of literacy. The early leaders of the Reformation, Luther, Calvin or Knox, waged war by the written word (helped by near simultaneous advances in printing technology) and their opponents, while continuing to insist that the Bible must remain in Latin, responded in kind. Religious boundaries gradually aligned themselves along national lines – sometimes fairly peacefully (as in England) but sometimes only after prolonged and vicious civil war (as in France). These alignments in turn moved the armed struggle onto the international stage. The second half of the 16th century in particular was to be dominated by a Catholic crusade, led in turn by the Holy Roman Emperor Charles V, and his son, Philip II of Spain, against the two most obnoxious bastions of Protestantism in western Europe – Holland and England. We will return to this subject in our discussion of state finances, but first there is a critical difference between the two warring religions which warrants exploration as it impacts subtly on the eternal coin as a medium of exchange over time.

One of the most critical differences between Catholicism and Calvinist Protestantism revolved around their views of the afterlife. The established

belief was that the destination of man's eternal soul – either its ascent to heaven or its descent to hell – was determined by his behaviour while in the living world. Crudely speaking, it was this belief that fuelled the mass donation of money and land to the medieval church, and provided a steady source of income from the living to fund intercession through prayer for departed relatives. The Calvinist view was completely different – man's final destination was pre-determined by God, and the world was divided between the elect and the damned. This produced two very different value systems, two different economic models and ultimately two rather different eternal coins. While the Catholic world continued to invest heavily in eternity through direct subsidization of the church, the Protestant world was driven by other concerns. During the more intense phases of the evolution it manifested itself in the destruction of religious buildings and the defacement of religious images. Over the longer term, however, it evolved into something more productive. Although he might already be a member of the elect, the convinced Protestant still needed something to prove his worth to his peers. Max Weber famously described the result as the Protestant work ethic. Weber's thesis is contentious and in essence simplistic (although there is nothing simplistic in the manner in which he argues it), but there can be no doubt that the vacuum left by the removal of the old religion's vision of eternity was filled by an emphasis on hard work as a sign of godliness. As it gathered strength and wealth, Protestant entrepreneurship also developed a strong philanthropic streak and a very human desire to have one's successes remembered by future generations. This ended up producing a new crop of large public buildings and ornate memorials. Thus the eternal coins of Catholicism and Protestantism, while underpinned by a different vision of exchange value over time, were often superimposed on very similar material investments of real wealth.

Beyond the monarchy and religion, the most important development of the early-modern era was the beginning of the process of globalization. Since we left the Middle and Far East during the first millennium BC, we have been concentrating entirely on Europe. Civilizations of considerable scale had developed, waxed and waned, elsewhere in the world, and some of them – the Chinese in general and the Muslim world in certain areas – were in many ways more advanced than their European equivalents. Our

excuse for not covering them is simply one of space, but the reason why we have been able to talk about Europe in isolation from them is that it really was isolated. Beyond the generally unhappy experience of the Crusades and the travels of Marco Polo, Europe was a self-contained entity until the late 15th century. This changed completely in a matter of only a few decades because of advances in maritime technology. By the 1490s, seamen finally had the vessels and the navigational instruments to make long voyages out of sight of land (something the Carthaginians had not been capable of 2000 years before). Technology alone does not necessarily produce change, and the launch of the great era of seaborne exploration was driven by three other factors: advances in astronomy which suggested that the world was round, long-standing fables of great wealth a vaguely defined Orient, and the insatiable need of the new generation of monarchs for more money. All of the early ventures overseas were state-sponsored searches for wealth – private investment in trade simply followed in its wake.

The popular history of the age of discovery tends to accentuate westward voyages and the accidental discovery of America. This prominence is valid in as much as explorers like Columbus were followed by conquistadors like Cortez and Pizarro who opened up to Spain massive new sources of gold and silver, providing the Spanish-led Catholic counteroffensive against Protestantism with a huge war chest. Spanish exploration to the west, however, was matched by first Portuguese and then Dutch exploration to the east, which did actually find the fabled Orient, a land rich not as much in precious vessels but in equally valuable spices and other luxuries. There was one very critical difference between the exploitation of these discoveries (beyond the Pope's mediation on Spanish-Portuguese squabbles over exploitation rights which resulted in a dividing line down the middle of Atlantic – and incidentally made modern Brazil the only Portuguese speaking South American country). The Spanish crushed the Aztec and Mayan civilizations in Central America and the Inca civilization in the Andes, and thereafter ran what was basically a one-way trade exporting gold and silver from the mines they discovered. The civilizations of the East were stronger and the desirable commodities could not be conveniently recovered by digging holes in the ground. Thus in the East, trade was very much a two-way process, and one of the problems faced in the

early years, before western countries could deploy sufficient might to support more exploitative practices, was to find goods which local traders would accept in return for their high value commodities. The result was that a proportion of the precious metal imported from the Americas was then exported to the East to barter for spices. The eastbound gold and silver had usually been minted into Spanish or Portuguese coins, but its value at its destination was simply as bullion.

The state-sponsored expeditions were followed first by private trading companies, such as the British and Dutch East India Companies, and rather more slowly by colonists. The objectives of the first were straight commercial profit, but in the absence of a strong government presence they often developed pseudo-state infrastructures of their own, employing among other things their own armies. Colonists' motives were more mixed – some, most famously America's Pilgrim Fathers, were seeking religious freedom and some were simple adventurers. As colonies became better established, they began to attract a steady stream of people seeking economic opportunity, either by exploiting land they could not hope to own in Europe, or to participate in an increasingly large and complex transoceanic trading network. The new worlds produced not only precious metals and spices, but also new luxuries, such as furs, new opportunities for mass agricultural development – such as the sugar industry of the West Indies or the cotton plantations of the American south – and potentially massive reserves of raw materials such as wood which were increasingly scarce in Europe.

The growth of oceanic trade re-kindled the need for naval might to protect a nation's own trading interests and attack those of rivals. England got off to a strong early start in the Atlantic, making rapid advances in warship design which allowed it both to attack Spain's early monopoly on trade in the Caribbean and to fight off the Spanish Armada – Philip II's huge attempt to crush his most aggressive commercial rival and most pernicious religious foe. Elizabethan maritime supremacy, however, was short lived, and neglect in the early Stuart era was so great that Barbary pirates began to prey on the increasing stream of "Western Adventurers" to the extent that by the 1620s they were capturing roughly a fifth of the ships setting out for the New World. Arguments between King and Parliament about funding a larger

and more effective navy were one of the touchstones of the English Civil War – a long and bloody process which lost the king his head and sparked a brief but violent upsurge in religious radicalism. Its long-term outcome, which was only really settled when a restored Stuart monarchy was again overthrown in 1688 was a constitutional monarchy very different from the absolute model which generally took root on the continent, and an de-facto pact between crown, aristocracy and business which would provide the foundations for Britain's surge as an economic powerhouse in the 18th century. By this time, it had built a navy that would guarantee it control of the seas, the critical period being not the series of wars with France in the 18th century, but a hard-fought struggle with the other maritime Protestant power, the Dutch, in the second half of the 17th.

We are close now to being able to strike our pre-industrial eternal coin, but before we do we must return to the subject of finance. The 16th century was a time of profound change and turmoil, partially because of the huge inflationary influx of gold and silver from Spain's American colonies and partially because of the appetite of the new generation of absolute monarchs for cash to secure their legitimacy and fight their wars. The success or failure of increasingly well defined national states in establishing themselves in the 17th century was largely determined by the progress they made in constructing a financial system that would support the state's administrative, military and naval requirements. As colonization gathered momentum and as the last round of highly destructive religious wars burnt themselves out, the financial system began to assume international dimensions. The need for capital to finance long-distance trade and overseas commercial development, and the opportunities for profit thus presented created a much wider investor base whose activities were informed by the increasingly high informational content in our eternal coin. The development of information-driven international financial markets would be a long-term evolutionary process, but its key elements were in place by the early 18th century – including the dangerous propensity for uninformed mass popular investment such as that in the ill-fated Scottish attempt at colonization – the Darien Disaster, which bankrupted the country and led directly to its political union with England in 1707, and the huge "Bubbles" of the following decade and a half, including the South

Sea Bubble in England and John Law's Mississippi Scheme in France, which imploded almost simultaneously in 1720-21.

# CONTINUITY AND CHANGE

Before moving on to the era of industrialization, it might be timely to pause and compare the four eternal coins we have constructed. All have a common material base in control of land and in the use of largely human labour to extract value from it. The coin of the first great civilizations is clearly differentiated by its power structure and its focus on the afterlife, while the European medieval coin has unique characteristics due largely to the twin pillars of feudalism and the Christian church.

There are, however, a lot of broad similarities between the coin of late Republican Rome and that of 18th century Europe. There is a huge difference in geographical scale, but both, while also based on land ownership and human labour, shared an increasing emphasis on generating wealth by trading a complex basket of goods over space, and a dependence on the security provided by an expansionist state with which there was a strong sense of collective identity. Both were times of accelerated technological change, of increased urbanization, and of improving literacy in which the informational content of our coin, both in political and economic terms, was rising. One point worth noting, is that information itself moved at roughly the same speed by land or sea in both worlds. This remained the case into the 19th century – the British army, for example, fought and lost the Battle of New Orleans on 8 January 1815 unaware that a peace settlement had been negotiated between Britain and America at Ghent on the preceding Christmas Eve.

There were, however, important differences hidden beyond the move from the European to the World stage. This might best be illustrated by staying briefly in the realms of military history and comparing the century long struggle between Rome and Carthage with what could be called the “Second Hundred Years War” (there were in fact six separate wars) – the confrontation between Britain and France which began with the outbreak of the War of the Spanish Succession in 1701 and ended with the final defeat of Napoleon in 1815. The most obvious difference is that this time round the maritime power won. The reasons why it did so were complex, but two are of paramount importance. The first is that the more complex technology of naval warfare, and the more advanced skills and material means necessary to achieve

maritime dominance, were such that the French could find no simple antidote like the Roman *Corvus*. British maritime supremacy increased to the point where the results of naval engagements were all but pre-ordained. Admiral Villeneuve sailed to Trafalgar knowing he would be beaten and his fleet destroyed. The second is that behind its control of the seas, Britain had built up the strongest economy of its age – one that gave it the means not only to field armies of its own, but more importantly to provide huge subsidies to France’s enemies on the continent. Even Napoleon, who defeated each of these enemies in turn before his fatal attempt to invade Russia in 1812, failed in the face of this potent combination. His attempt at economic warfare – the embargo on British imports known as the Continental System – failed simply because Europe needed British manufactured goods, and British traders were able to smuggle their way past the embargo on a massive scale.

# DARK SATANIC MILLS

*“You cannot fight against the future. Time is on our side.”*

William Gladstone

*“Upon the sacredness of property civilization itself depends – the right of the labourer to his hundred dollars in the savings bank, and equally the legal right of the millionaire to his millions.”*

Andrew Carnegie – Wealth

If foreign trade was one pillar of Britain’s rise as an economic superpower, the other was the Industrial Revolution. We will not dwell here on the nature of the Revolution itself save to say that the term itself is not really appropriate as we are dealing with a host of technological and business innovations stretching over a period of more than a century. Before picking out the main factors that distinguished the industrial era from its pre-industrial counterpart, there is one important point that should be made. The fact that industrial revolution began in Britain and continued to be led by British entrepreneurs until at least the third quarter of the 19th century was partially a product of Britain’s pre-eminent trading position and partially a product of Britain’s security behind the Royal Navy. The last serious fighting in Britain ended with the English Civil War, and beyond several small doomed Jacobite forays, the only ‘invasion’ was the unopposed arrival of William III in 1688. From the end of the 17th century on businessmen generally had nothing more serious to contend with than sporadic small-scale outbursts of social unrest.

Industrialization was an immensely complex process but it is possible to identify a small number of key developments that must be factored into our coin. Technological advances had six major consequences. First, a wide variety of manufactured goods could be mass-produced on a huge scale. Second, briefly by canal but thereafter by rail, raw materials could be moved to factories and finished goods either to domestic markets or ports on a scale. Third, although the new factories were mass employers of labour, the large-scale combustion of fossil fuels – almost entirely coal – changed the economics of life (and thus our coin) profoundly. The importance of coal was such

that it changed the entire demography of the UK, large industrial towns growing rapidly in the North of England where the major coal deposits were located. Fourth, the key strategic raw material beyond coal became iron ore from which produced first the iron and then the steel that built machinery and transport infrastructure, and equipped armies and navies. Fifth, population growth, fuelled by technological progress and improving health and wealth, produced large imbalances in food supplies, which were met by developing large scale food production in non-industrial areas. Sixth, the scale of entrepreneurial activity produced the need for greater and greater concentrations of capital and eventually moves towards cartelization. The same population growth also triggered mass migration – most importantly from Europe to the United States – and played a key role in the final emergence of the new world as a real rival to the old.



Much of this is fairly obvious, but there were some more subtle developments which might be missed. One of the most important was the mid-19th century laying of transoceanic cables which allowed near-instantaneous communication between the major power and trade centres of the world. The power of the telegram was immense – it transformed trade through a step change in the informational content of decision making. It also transformed international relations, giving ambassadors quick access to their masters at home, and making it easier to resolve more, but by no means all, potential sources of conflict by negotiation. A second important development was the power of industrial might to create and distort markets. One of the best examples of this was the Manchester cotton industry. Cotton had never been grown on any scale in Britain, and in any case the growth of fast seaborne carrying capacity made it cheaper to import the raw material from areas where it could be grown on a large scale. One of these areas was India, effectively a British-dominated trade zone before the Indian Mutiny and afterwards the most important part of the Empire. With British businessmen in control at all the key points, Britain imported raw cotton from India and exported cotton cloth goods back to India, with the Indian consumer paying the costs of two long sea voyages and a foreign factory. The third development was that the search for new markets triggered a new phase of imperial expansion. Some of the late arrivals in the new imperial race were driven by the ambitions of governments, but the largest empire – that of Britain – was the result largely of private initiative. Britain was pulled into most of its 19th century colonial wars by adventurers and traders. Here again, however, two other aspects of the contemporary eternal coin were extremely important – its informational content and its representation of an aggressive sense of national identity. While politicians were often anxious not to acquire new possessions or become embroiled in colonial wars, they were generally unable to resist the public demands for action whipped up through the press by unscrupulous business interests – particularly in cases where local resistance had led to British lives being lost. From a modern ethical standpoint there is little to be proud of in the last great age of empire, even if it did produce a steady stream of acts of extreme heroism and a large cohort of colonial administrators who tried very hard to improve the lot of their new charges.

Among the low points of 19th century European imperialism were the two Opium Wars of 1839-42 and 1856-60 in which superior British (and in the second war British and French) military and naval might was used to force China not just to lift its prohibition on the import of opium – which was being smuggled in by British merchants from India at the rate of about 1,400 tons a year – but to cede Hong Kong to Britain, pay large indemnities to the attackers and open their ports to foreign powers and ultimately allow foreigners to travel throughout the country without interference. Thereafter, the European powers all maintained permanent military and naval forces in the Treaty Ports, and responded aggressively to any interference with their commercial rights. The Opium Wars fatally undermined Chinese civilization, which had waxed and waned largely isolated from the world beyond the volatile states around its own borders since the terracotta army had been buried 2,000 years before (with the one major exception of Mongol conquest and rule in the 13th and 14th centuries). In a sense, however, the whole unsavoury business made globalization more complete – a process further advanced from the 1860s by the opening of Japan to the world, a completely different process in which the Japanese state successfully controlled developments throughout.

By the beginning of the 20th century the eternal coin was showing fewer and fewer regional variations. Basic wealth was still being extracted from the ground and land remained the important ingredient, as it had so far. Technology, trade and information were, however, determining how the wealth was developed and transmitted, and beyond the individual pursuit of greater health, happiness and comfort, there was a shared if not always coherent belief in the developed world in the continued progress of civilization. National identity had become a strong and differentiating feature, and would prove of critical and dangerous potency when harnessed to divergent views of national objectives in the two world wars. The telephone, the radio and finally the television intensified the information content of the coin, and oil increasingly replaced coal as the major source of energy. Continued improvements in aggregate wealth and an uneven movement towards wider political participation went hand in hand with the growth of the knowledge economy and, in terms of our thought experiment, the eternal coin was becoming more and more the currency of entire

societies rather than just their elites. The wider coin really developed only by degrees from the mid-19th century to the mid-20th, but it is instructive to stop on the threshold of the modern world to consider two contemporaneous exceptions – the Plains Indians and the Confederacy.

## PLAINS INDIANS

One interesting example is the Plains Indians of the mid-19th century. At the same time as the Union and Confederacy were fighting out a very modern war to the East, the Sioux, Comanche and Kiowa were living a nomadic lifestyle which revolved around just two things. The most important was the huge population of American bison which provided them with their major source of food, shelter, clothing and most other material goods. The second, which had made them far more effective hunters and allowed the support of a larger population, was the horse, which had been introduced to Mexico by the Spanish, and began falling increasingly into Indian hands in the 18th century. Indian bands were nomadic, following the seasonal migrations of the Buffalo herds. Inter-tribal hostilities existed but were low-level and sporadic simply because there was no need to compete for food and no attachment to any particular land. Belief systems were animist, involving a strong beliefs that everything had a spirit and that all were governed by one Great Spirit. Worship both of the Great Spirit and of a host of individual spirits in search of good fortune provided the aspirational content of what was otherwise a simple coin, which found its only common material manifestations in collections of talismans in medicine bags and warriors' highly decorated shields.



## THE CONFEDERACY



The Confederacy, a political entity with a life of less than five years, could be said to have embraced the mirage of a special eternal coin of its own. Before secession, the 13 states of the South were simply part of a still evolving American democracy with an established position in the mid-19th century trading world that largely revolved around the export of cotton to Europe in return for a host of goods and commodities. When the South went to war things changed. The Southern economy was highly specialized – it had only a small industrial sector and was only marginally self-sufficient in food. Southern statesmen went to war confident that the tiny US Navy would not be able to interfere with the export of cotton and the import of arms and other necessities. When the Union imposed a blockade far more quickly and effectively than expected, the South remained buoyed by the expectation that the cotton-hungry mills of Europe would lead Britain and France to recognize them and intervene to free the seas. The Confederacy issued its own currency – effectively it was a cotton bond based on the belief that the blockade would be broken. It could also be taken as a fair proxy for a rather short-lived eternal coin – one which would be exchangeable over time and space in pursuit of the common goal of independence. The real Confederate dollar held a high purchasing power in the early part of the war, when hopes of either victory over the North or European intervention were high. It began to depreciate rapidly as these hopes waned and in the last year of the war was effectively worthless. The eternal coin proved a little more durable. Confederate armies fought to the last. Though the Confederates were hardly in a position where the only alternative was death, some glimmer of the original coin's value must still have been there in the trenches around Petersburg.

# THROUGH A GLASS DARKLY?

*“For now we see through a glass, darkly.”*

The New Testament, 1 Corinthians 13

We return now to the last of our eternal coins, today's. You will already have realized that this essay does not present globalization itself as the revolution it is commonly perceived to be. Three innovations have, however, accelerated the process and changed the real economy and the virtual coin profoundly – the jet aircraft, the micro-processor and medical progress. The first has reduced the effective circumference of the earth from weeks to hours. The second has produced a genuine information revolution – one of such scale that it is virtually impossible to calculate the size of the data mountain available. The third is medical progress in general, and mass vaccination in particular, which has played a major role in the acceleration of population growth, largely free from the savage correcting mechanisms of early mortality and epidemics.

These developments have taken place against the background of another trend, which although it had its roots in the 19th century has accelerated quickly thereafter – the growing role of the state in the economy. Early states had little more than control of a nation's armed forces and the administration necessary to collect taxes and administer law and order. The British public sector, for example, accounted for roughly 10% of the economy in the late 19th century, and the single biggest ticket item was the Royal Navy. Today the figure is close to 50%, with the increase driven by the large-scale entry of the state into education, health and social welfare provision with a related mushrooming of the state-paid workforce. Further, as average life expectancy has increased, states have incurred spiralling pension obligations. The importance of state pension obligations cannot be overemphasized, as they are not as susceptible to changes in government policy as the others, and have a built-in growth dynamic of their own. It is also noticeable that the state sector is very resistant to political attempts to shrink it for the simple reason that politicians are dependent on jobs and visible expenditure to stay in power.

Time and information have always been important contributors to wealth creation, but in the past both impacted on a scale which was measurable. It is no longer clear if this is the case, and one of the unanswered questions still hanging over the recent credit meltdown is if human decision makers and the systems they create can actually manage the information flows necessary to manage risk. Another open question is that of the preservation of the value of information. There is already evidence of state-sponsored attacks on digitally stored confidential and highly sensitive data, and at the more banal level, mass use of electronic fraud to steal real money from real people. Any paper currency's value is affected by confidence in the assets and institutions behind it, and the same must be true about the informational property in which so much of today's value is thought to reside. It could well be that those who speculate on the future disappearance of physical money are completely wrong – without a completely secure alternative, we might actually head in the other direction.



If the future of the knowledge economy is one of the blurred edges of today's eternal coin, another is the future of the environment. This is not the place to rehearse the debate about global warming, or the debate about sustainable production of fossil fuels ("Peak "), but one way or another, the world seems unlikely to be able to continue to increase its consumption of hydro-carbons for much longer. At the time of writing there is little more than a general consensus at state level that co-ordinated and decisive action is required. Every attempt to negotiate an agreed plan of action has failed. At the individual level, the unbelievers and uninterested almost certainly outnumber the environmentally aware. The environment is an entirely new addition to eternal coin manufacture. Save for the occasional preservation of beasts believed to be sacred or otherwise special, and the more modern move to create national parks or similar protected zones, mankind has always created value by taking from the earth what he can without particular regard to the consequences. As have argued throughout this paper, extraction has produced the base material for our otherwise changing eternal coin. Putting it another way, the short to medium-term future of the planet and man's life on it has only been questioned by those of extreme religious persuasions. It is still an open question if this situation is going to change. Thus, once again, we must question the future of our eternal coin.

With this level of uncertainty, we have reverted to a highly stylized eternal coin image with three major components, each of them a source of uncertainty: the earth itself – the land component that has featured in every other coin, but more rapidly becoming a finite resource; energy – first extracted from men and animals, then from fossil fuels; knowledge – from raw brains in the physical economy to the distribution of brainpower through information and communications technology, as well as knowledge being the hoped for driver of future wealth. The eternal coin is blurred and the imagery is uncertain. This seems a fair reflection of the current state of the coin. The eternal coin itself as a measure of wealth and exchange over space and time has always also been a measure of equity in terms of trade and sustainability over time. Sustainability is widely used in contemporary planning, logistics, finance and

debate. We have a long way to go, and some very difficult exchange decisions to make, before sustainable scenarios can be seen as realistic futures.

# TOWARDS A LONG FINANCE RESEARCH AGENDA

As was made clear at the start, the eternal coin itself is simply a thought experiment. This paper is not the product of deep research, but rather of the reflections of an historian around the theme in question. It has, however, thrown up some interesting topics which might provide part of the Long Finance research programme. The list that follows is by no means exhaustive – it simply picks up on some of strongest continuities or points of inflection and asks what we need to do to understand them better.

- 1 The strongest continuity across time is land, not just in terms of how it was owned or apportioned, but how it was exploited. If there is any one thing that has had a value across time it is not gold (which was not even a feature of some civilizations) or knowledge (access to most of which has generally been restricted until the modern era), but land. The value has fluctuated across time and place (the verdant fields of Carthage, for example, are no more; while many of the fields written off as “waste” in the Domesday Book would later be returned to profitable cultivation). Its value has been driven by the varying balance between population and availability, and by changing means of exploitation, but the intrinsic value has always been there. It is no accident that the longest living commercial entities in Britain – the City of London, Oxford and Cambridge colleges or the Anglican Church have held most of their wealth in land. In the wake of a financial crisis caused in part by what might be termed a systematic failure to price land accurately, there seems to be a particularly strong case for this programme to commission some in-depth research on land as a source of value over time, and the different mechanisms which have existed to control, price and exchange it.
- 2 The second question flows on from the first. If land is the most important source of eternal value, what impact will the unprecedented rate of population growth and the increasing degradation of natural resources have upon it in the future. Man has been interfering with the planet since he first walked on it, degrading value here and enhancing it there. An assortment of control mechanisms, not least disease, limited access to resources across space, technological ignorance and the medium-term fragility of most politico-economic systems has kept the interference within the planet’s ability to adapt to it. At some point, we either already have or soon will pass that point. What happens then? The obvious conclusion seems to be that the Long Finance of the future and the search for Environmental Sustainability are one and the same thing. In the lexicon of the exam paper: Discuss!
- 3 For most of human history, our Eternal Coin, would really only have been changing hands among a fraction of society – most people’s aspirations over time would have largely centred on ensuring that some of their children lived to enjoy whatever limited well-being they themselves had attained. While there was always movement up and down the socio-economic scale, and there were times when the scale waxed or waned, most of our essay has been concerned with only a few percent of the total population. This is no longer the case. While economic realities might be unchanged, even in the Third World aspirations have risen as a result of the communications revolution. Long Finance has thus become the object of the people not just their leaders. What are the consequences? Do increasing numbers of participants result in a greater propensity for de-stabilizing speculation? (Were there any significant speculative bubbles before the Dutch tulip mania of the early 17th century?) Is increasing participation driving markets’ much-lamented short-termism?

4 All of our Eternal Coins were driven by aspirations, and for much of the last couple of centuries these have been underpinned by a general belief in human progress towards a wealthier, more comfortable, more secure future. What happens to Long Finance if this belief falters? One of the more compelling historical truisms is that revolutions are often caused by decelerations in the rate of progress and frustrated ambition (thus the place of the middle class in the vanguard of most modern revolutionary movements). The generalities of today are that globalization and the knowledge economy are good things to which we can continue to trust our futures. As the paper has already pointed out, however there are some black clouds scudding about. Is there scope for Long Finance to become regressive and restrictive? This is not as wild as it sounds. The general reaction to a financial crisis is normally for investors to buy gold and for governments to erect tariff barriers. Sounds familiar? It should.

5 Finally, there seems to be scope for some serious thinking on the value of information. Knowledge really falls into two classes – that which has permanent value and that which has transient value. Permanent value can be exemplified by the mastering and diffusion of a particular technology which improves overall well-being. Transient value can be exemplified by somebody gaining a particular piece of market intelligence before a competitor and acting profitably upon the advantage. Most of the theory has been constructed about the second type, but this author suspects that most of the real eternal value is in the first – the accumulation of a process of serial commoditization. Informational advantages are very hard to protect. There are few historical examples of enduring informational advantages – the ability to make “Greek Fire” is one that comes to mind, though in the end the Byzantines appear to have forgotten how it was done. Much of the knowledge economy, or to be more accurate, the knowledge economy as a source of profit, is based on the premise that the knowledge in question can be protected in electronic form – yet at the time this is being written, national governments are

advising their citizens not to use certain internet search engines because of concerns about security. What then is the Long Finance view of the Knowledge Economy?

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