

## **Imagining the Future**

### **Towards an Economic History of Time Preference & Time Horizon**

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“Were life to endure forever, were the capacity to enjoy in perfection all its goods, both mental and corporeal, to be prolonged with it, and were we guided solely by the dictates of reason, there could be no limit to the formation of means for future gratification, till our uttermost wishes were supplied. A pleasure to be enjoyed, or a pain to be endured, fifty or hundred years hence, would be considered deserving the same attention as if it were to befall us fifty or a hundred minutes left” John Rae, 1834, p. 53

“The present always gets its rights. It forces itself upon us through our senses. To cry for food when hungry occurs even to a baby. But the future we must anticipate and picture. Indeed, to have any effect on the future, we must form a double series of anticipations. We must be able to form a mental picture of what will be the state of our wants, needs, feelings, at any particular point in time. And we must be able to form another set of anticipations as to the fate of those measures which we take at the moment with a view to the future”

Böhm Bawerk, 1891, 244.

#### 1. Introduction

Time is a fundamental dimension of the study of economic history, yet we do not think a lot about time – how it is ‘experienced’ and how that changes over time. This is an attempt to start thinking about one aspect of time: the role looking into the future plays in economic (and political) decision making. More specifically, we focus on ‘time preference’ – the degree to which the (distant) future is literally taken into account – and the related concept of ‘time horizon’ – the end of the period in the future that is still considered relevant for contemporary decision making. We will argue that time preference and time horizon have fundamentally changed over time – from being quite short in hunter gatherer societies to becoming quite

long with the rise of ‘capitalism’ in more recent times. Moreover, both may also differ substantially between (historical and contemporary) societies. These changes in time and the spatial differences between societies are not understood well, but are, we will argue as well, important determinants of economic growth and societal change. Time preference is related to ‘delay of gratification’, a concept used by social psychologists to analyse human behaviour. They have demonstrated that the ability to delay pleasure (to save in the terminology of the economist) is an important dimension of human behaviour that differs from person to person. Moreover, this ability has a strong impact on personal development: people who at a young age already can delay gratification, are on average more successful later in life (Mischel et.al. 1989). Similarly, simple growth models in the tradition of Solow often have an exogenous time preference that determines the savings rate that in its turn causes the rate of economic growth – eg.i.e. time preference is the exogenous variable that makes the difference. But what explains variation in time preference between countries and over time? Which economic, social, institutional factors determine the time horizon of economic and political decision makers? These are relevant question, which are unfortunately not asked very often.

There is an additional reason to be interested in this issue: the challenge of creating a sustainable society, in which the interests of future generations are taken into account. The Brundlandt Committee defines ‘sustainable development’ as ‘development that meets the needs of the present without compromising the ability of future generations to meet their own needs’ (World Commission on Environment and Development 1987). This obviously implies that in decision making the interests of future generations have to weigh heavily. It is however unclear how time preference and time horizon can be extended in such a way that actual decision making will reflect this. Our search for the historical determinants of time preference is also motivated by this issue: can we understand why in the past time preference changed and time horizons were extended? And is time preference still changing in the ‘right’ direction, or have economic and political institutions developed in such a way that policy makers and entrepreneurs have been faced with increased pressures to ‘score’ in the short term, at the expense of the ‘long view’. Is there, in other words, a clash between the need to increasingly think and plan ahead – to extend the time horizon – and the short termism of contemporary politics and business, which is standing in the way of a transition into the direction of greater sustainability?

In this exploratory essay we will use the following concepts: time preference is the degree to which one weights future events – material satisfaction for example - compared to

present ones. It can be measured quantitatively by the discount rate, which is one when future satisfaction is appreciated equal to present consumption (an extreme situation); normally, the discount rate is somewhat below one, and the lower it is, the less future events weigh in current decision making. Time horizon is a related concept; a long time horizon means that one is also concerned about events happening in the distant future, which is consistent with a high discount rate (when the discount rate is one, the time horizon is in principle infinite). Patience is also used in this literature: being patient obviously means that one is prepared to sacrifice current consumption in return for (higher) future consumption – and therefore attaches great value to future events.

We will first briefly focus on what we know about global patterns of time preference (which is not a lot), then discuss some of the theories that have been developed to shed light on this issue. The next section will be devoted to the deep roots of the change towards a long time horizon: the Neolithic Revolution

## 2. How to measure time preference?

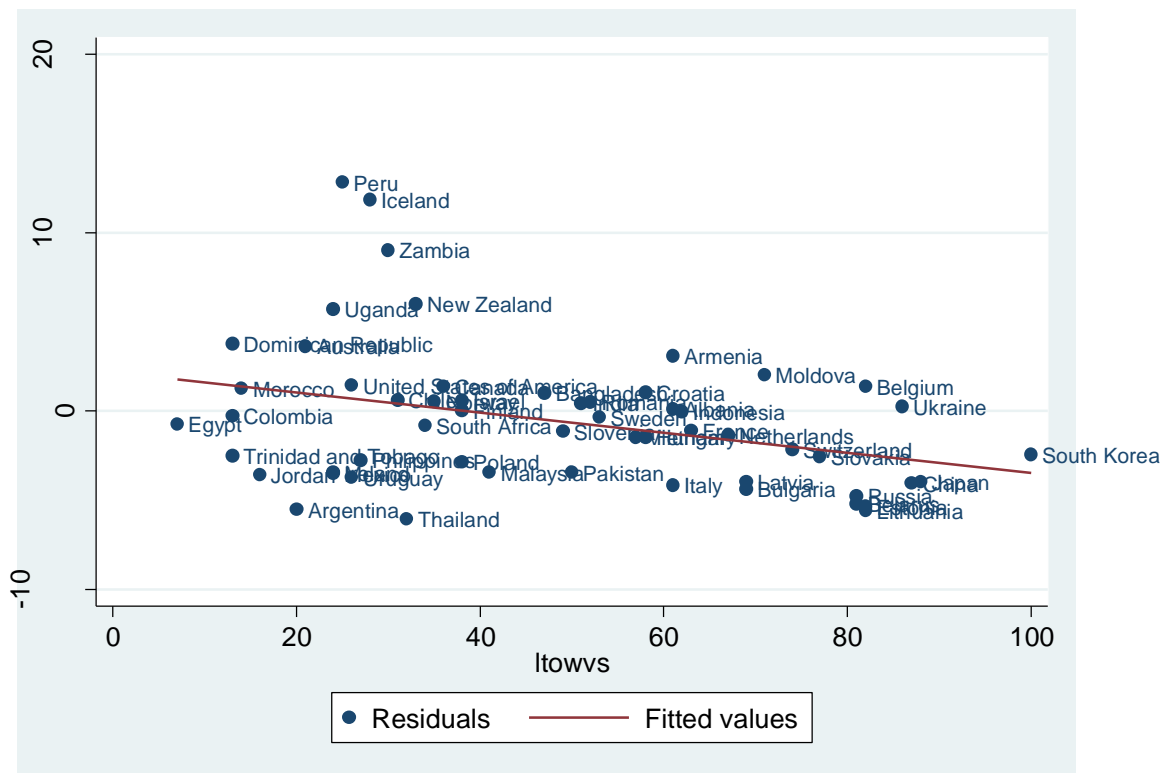
There are in essence three ways to measure time preference. Firstly, people state their preferences – their values – when questioned by surveys such as the World Value Survey (WVS). By looking at those questions that are related to time preference, it can be inferred how respondents in different parts of the world ideally value time. This approach has been developed by Hofstede (et.al. 2010) and has resulted in an index of ‘time preference’ which is available for 93 countries, and which is used by economists as the index measuring this variable (Galor and Özak 2015). One could call this the ‘subjective’ approach, as it is based on surveys of respondents who simply are asked to make statements about their ‘subjective’ values and ideas. Secondly, time preference can be read from economic data – such as interest rates – which reflect actual economic decision making concerning the balancing of the future versus the present. We could call this the ‘objective’ approach, as it is the result of real economic decision making. Thirdly, experimental economics and psychology can actually measure the choices people make in test situations – when they have to decide to eat the marshmallow that has been given to them immediately, or postpone gratification and get a second one after half an hour. All three have their drawbacks and limitations, as will become clear soon, and only offer a very limited picture of the ‘underlying’ values that we are interested in.

Hofstede (1991) is well known for his pioneering work on the values and norms of different societies, which he originally classified in four groups (or dimensions): Power Distance; Uncertainty Avoidance; Individualism versus Collectivism; and Masculinity versus Femininity. Later on, after an experiment involving Chinese scholars who set out to make their own classification of values, a fifth dimension was added, originally called 'Confucian Dynamism' as it reflected Confucian values such as stability, the value of family and virtue. Unsurprisingly, China scored the highest on this dimension in the original research. But in 1991 Hofstede re coined this dimension into 'Long-term versus short-term orientation', and it now – after new work on measuring it – often features as a measure of time preference in academic work. The global map of time preference measured in this way shows a distinct pattern: people are very much 'forward looking' in China, Russia and Central Europe, somewhat less so in the rest of Europe, the Americas and India, and much less so in Africa, where 'time preference' is lowest. The estimated index ranges from zero (Puerto Rico) to 100 (South Korea), Germany ranks quite high (83), Great Britain is doing much less well (51, close to India and Pakistan), and Australia (21) is near the bottom of the ranking, just between Iraq (25) and Argentina (20) (Hofstede et al 2010).

But is this index really measuring time preference? The current index is based on three questions from the WVS. The first one concerns the desirability of thrift as a trait for children, chosen from a list of such traits. The list included: independence; hard work; feeling of responsibility; imagination; tolerance and respect for other people; thrift; perseverance; religious faith; unselfishness; and obedience. The percentage choosing 'thrift' is entered into the index. Whereas one could indeed relate thrift to time preference, this becomes more difficult with the second question, concerning National pride: 'How proud are you to be (name of your nationality)?': the percent choosing 'very proud' scores negatively on the time preference index (as the authors explain: 'this item measures an aspect of self-enhancement'). The third question that is used for the index is about the importance of service to others: 'For each of the following, indicate how important it is in your life: family; friends; leisure time; politics; work; religion; service to others': percent choosing 'very important' for service to others, scored negatively. A factor analysis is used to distill the index, based on these three criteria: thrift (positive), pride (negative) and 'service'(negative). There are other questions from the WVS which can possibly be linked to time preference, such as question asking for an assessment of indulgence versus restraint, which gives a completely different picture of the international disparities on this score, but for the moment we can only conclude that it is very difficult to get a clear picture of time preference from these value surveys.

But why bother about values when we have direct evidence about time preference in the form of interest rates? For economists this is clear evidence of the time preference of households, as they will allocate their income over savings and consumer expenditure consistent with their time preference, and thus (help to) determine the equilibrium interest rate at the market for savings. Global maps of interest rates – and of savings as a share of GDP – may therefore tell a lot about time preference. For the recent period, such maps show relatively high interest rates in SSAfrica, Latin America, Russia and South-East Asia, and relatively low interest rates in the high income countries. But these interest rates are distorted by many factors: for example, monetary policies have driven down interest rates in Europe, Japan and the US to levels – sometimes close to zero - which are probably highly distorted and not in equilibrium. Moreover interest rates include besides a compensation for time preference a risk premium – dependent on the quality of the institutional framework – that may differ enormously between countries. And inflation also affects nominal interest rates, but usually only to a certain degree, implying that high levels of inflation may result in negative real interest rates. Therefore linking interest rates to the ‘pure’ time preference is not an easy matter. In the appendix we explain how we for a year before the financial crisis of 2008 have tried to test a model that takes this into account and measures some kind of ‘pure’ time preference. This results in a map which shows certain similarities with Hofstede’s time preference: ‘real’ interest rates (corrected for inflation and the quality of institutions) are high in Sub Sahara Africa and parts of Latin America (perhaps not a surprise), but also in North America and Australia (which is perhaps surprising), whereas the lowest rates are found in Western Europe, Russia, China and Japan.

The two measures of time preference – Hofstede’s index and the real interest rate corrected for the risk premium – are correlated, however, as figure 1 demonstrates. It shows on the horizontal axis Hofstede’s index and on the vertical axis the real interest rate; in Uganda, Peru, The Dominican Republic and, surprisingly, Iceland, both indices are quite high, whereas Japan, China and South Korea show low values on both counts. There is clearly some kind of a link with GDP per capita, but the correlation is not very strong, and in fact not significant, because of outliers such as New Zealand, Australia and the United States with high real incomes but without a low time preference.



Thirdly, experimental economics and psychology has done a lot of work on measuring time preference of individuals (mostly students). But time preference in this kind of studies means, for example, being able to postpone the consumption of a marshmallow for 15 minutes, or income for 1 to 5 days (measuring, for example, the ‘present-bias’ of discounting behaviour). Such studies have documented that the real discount rate is not stable and fixed, but shows a hyperbolic function: it is extremely high for short periods of time (and small sums of money), and much lower for long time periods (and large sums) (see overview by Frederick et.al. 2002). The experimental studies might help to test theories about the determinants of time preference, or about its long-term consequences in terms of the success of the respondents during their life cycle, but do not produce the kind of evidence on societal and historical differences in time preference that we are interested in. In their seminal study of the experimental studies on this topic, Frederick et.al. (2002) also concluded that ‘no longitudinal studies have been conducted to permit any conclusions about the temporal stability of time preference’ (so we do not know anything about historical changes over time), and ‘correlations between various measures of time preference or between measures of time preference and plausible real-world expressions of it are modest, at best’ (the results of the experimental studies, for example in terms of the discount rates found therein, are not in any way related to ‘real world’ discount rates at capital markets). (Frederick et.al. 2002 p. 63)

The most promising way of addressing the issue of measuring time preference is via a combination of the subjective survey method and the expertise developed with the experimental research. A research group linked to University of Bonn and lead by a.o. Armin Falk has developed a large project to measure preferences in a systematic way, in what they call ‘an experimentally validated survey module’ measuring six key economic preferences such as risk aversion, discounting, trust, altruism, positive and negative reciprocity for 76 countries (Falk et al 2016). The question are, however, based on field experiments and are focused on those issues which have been shown to have a high ability ‘to predict behavior in corresponding incentivized choice experiment’ (Falk et al. 2016, 2). One of the studies based on this new dataset of preferences analyses patterns in patience and their link to the wealth of nations (Dohmen et al. 2015). Patience was measured as a combination of responses to two survey questions, one directly reflecting time preference (‘would you rather receive amount X today or Y in 12 months?’), the other measuring ‘the willingness to give up something that is beneficial to you today in order to benefit from that in the future’(on a 0-10 scale). The weighted average of the answers to these two questions produces the map below

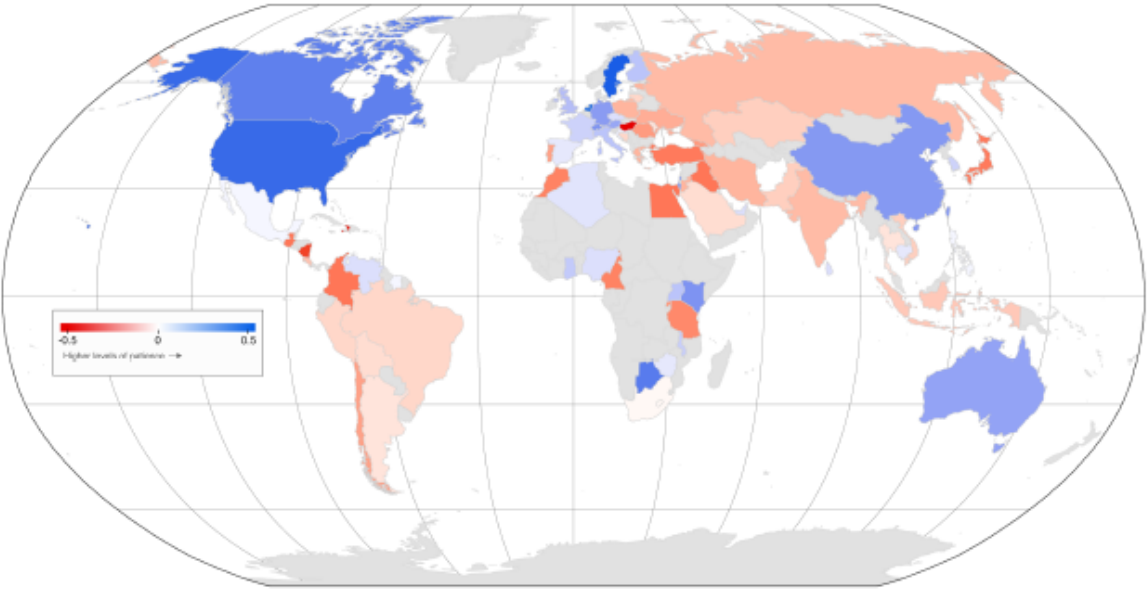


Figure 2: Distribution of Patience Across Countries

In their paper Dohmen et.al. (2015) show that there is a strong correlation between this measure of patience and GDP per capita; other performance indicators (human capital, for example) also correlate highly. But the question of the causality remains more or less open: perhaps in more prosperous countries investing in the future is more profitable and therefore income levels determine patience, instead of the other way around (as is suggested by Dohmen et.al. 2015). As we will see in the next section, other performance indices – life expectancy for example – are not only correlated with patience but may also cause it.

Summing up this section, it is striking how little we know about spatial patterns and long term trends in time preference, although it is a crucial determinant of long term economic success according to standard economic theory. The recent research by Falk et.al. (2016) may help to address the first issue – to get a better understanding of global differences – but will obviously not solve the lack of knowledge of historical changes. Most indices of time horizon and patience appear to have a strong positive link with GDP per capita, but it is unclear what is causing what, and how significant deviations from this pattern are.

### 3. Theories about time preference

There is a lot of theoretical work focused on explaining the results of experimental work on time preference and the delay of gratification, but this is of only limited relevance for our problem, since we focus on explaining spatial patterns and long term trends in this variable. The bottom line of the relevant theories we will briefly discuss is that they predict a positive link between time preference and time horizon on the one hand, and various variables such as life expectancy, income and wealth, which tend to rise with economic development. As suggested already, a lower time preference may also have strong positive effects on economic growth (via, most obviously, the increase in the savings rate), further reinforcing these correlations.

The first more or less systematic analysis of the propensity of nations to defer consumption and invest in their capital stock was published by John Rae in 1834, who distinguished four factors driving this process. Patience and frugality were promoted by (1) the desire to pass resources to future generations (of the family) and (2) by the capacity for self restraint. However, (3) the uncertainties of life and (4) the pleasures of immediate gratification put limits to saving and investment (see the summary of Rae in Frederick et.al. 2002). One branch of thinking about time preference that springs from this is the evolutionary/biological approach, in which saving is aimed at increasing the fitness of future



generations. Rogers (1994) has demonstrated that such an approach leads a rate of discount equal to the rate of population growth – of about 2% in the very long run. The other biological variable that shows up in the analysis of the determinants of time preference is life expectancy, which is for obvious reasons linked to the discount rate (which will be very low if one is certain to die tomorrow, and much higher when expected longevity is high).

The most ambitious attempt to model and endogenize time preference is Becker and Mulligan's (1997) paper which focuses, inspired by Rae (1834) and Böhm Bawerk (1891), on investment in imagining the future: the more clearly we can visualize the pleasures of future consumption, the more we will appreciate it, and the higher the discount rate will be (approaching 1 in the situation as depicted by Rae in citation on first page paper). If consumers are more wealthy, they will invest more in imagining the future, and the discount rate will tend to go up. Poverty, on the other hand, will lead to concerns about life expectancy (will one still be around in the next period?), which will reduce the discount rate. Schooling can in their view also enhance greatly the capacity to plan and visualize the future, and will therefore also have a strong positive effect on the discount rate. And obviously, uncertainty about the future will have the opposite effect. The bottom line of their theoretical contribution is however that people can invest in imagining the future – which they call 'future oriented capital' – and in that reduce impatience and extend the time horizon. Time preference is not something that is given, but endogenous and subject to societal /institutional influences. This is something that can be studied and analysed over the long run – which societies are investing more into imagining the future, and why do they do this? And how to break through the vicious cycle that poor economies do not have these resources, and therefore are caught into a poverty-trap, as savings are discouraged in societies who do not 'know' their future? How have societies in the past managed to break out of such stalemate?

Note that Becker and Mulligan (1997) do not argue that societies that invest in 'future oriented capital' necessarily know more about their future than societies who don't do this. The future is and remains largely unknown, unpredictable and uncertain. What counts is to imagine the future, to create pictures of possible futures which make it more 'vivid', more 'real', and therefore force us to consider it in contemporary decision making. This implies, we suggest, that also pictures of the future which are probably not correct, may have a strong impact on current decision making. We will see below that this has important consequences for the historical record.

#### 4. Historical trends: time preference in ‘deep time’

In his brilliant book on the history of mankind, *Sapiens*, Harari maintains that ‘Foragers usually didn’t waste much time thinking about next month or next summer. Farmers sailed in their imagination years and decade into the future’ (Harari 2012: 112). This probably neatly summarizes the role of the rise of agriculture on time horizon and time preference: by its very nature, agriculture implied the sacrifice of current consumption (of, for example, the seed grains) in return for more output and consumption at a later stage (at the end of the crop cycle), the sacrifice also of current labour (invested in clearing the land, in ploughing and sowing) in order to reap a larger harvest at some future moment in time. However, Harari perhaps exaggerates the difference between hunter gatherers and agriculturalists. The former were obviously also aware of the seasons – when to pluck berries, when to fish for salmon, when to hunt game animals (which might be more easy to catch for example in the dry season) – and therefore had to adapt their subsistence strategies to the seasonal fluctuations in food supply. But they did not have to invest their labour, seed grains and fodder into the harvest of some future crop or livestock product (such as wool or milk); they were not in the business of delaying gratification, which in a way was the core of the activities of the farmer. And their time horizon was probably limited to the seasons; the more strongly seasonal patterns were – and in temperate zones such patterns were generally more dramatic than in the tropics – the more planning was required to be an efficient hunter-gatherer. It is therefore perhaps no coincidence that the switch to agriculture started in regions with a mild climate with clear seasonal fluctuations, such as the Fertile Crescent and Northern China, and not in Africa where seasonal fluctuations were much more limited.

Galor and Özak (2015) have linked the productivity of agriculture to the spatial pattern in time preference borrowed from Hofstede. The idea is that in regions where crop yields were high, and therefore the transition to agriculture was potentially very profitable, attitudes focusing on the delay of gratification were well rewarded, and via selective reproduction became predominant. In short, the proposed model suggests a positive link between agricultural productivity and time preference, which is corroborated by the empirical part of the paper.

Agricultural societies had to manage another way of dealing with time than foragers. They indeed did this by imagining, structuring and planning time in a radically different ways. Calendars began to play an important role in their religious and social life. These societies invested large amounts of resources in discovering the cyclical patterns of the movements of

sun, moon and stars, in order not only to reconstruct them, but also to predict the future – the seasons (the annual rhythm of the flooding of the Nile, for example, or the annual cycle of the sun and the moon). This made it possible to predict the best moments for seeding and planting, for harvesting and processing of the harvest. Specialists – often member of a religious cast – collected the information about the cycles of sun, moon and stars, and used it to acquire a central position in socio-cultural life, for example by predicting lunar or solar eclipses or the flooding of the rivers. The massive cuneiform records of Babylon testify of the accuracy of their knowledge, and of the ability to ‘imagine the future’ in this way. The Maya calendar, which is supposed to have ‘predicted’ a cataclysm that would end the earth on December 21, 2012, was equally precise and detailed in its reconstruction of time. Similarly, large Neolithic structure such as Stonehenge, were probably constructed to deal with time – and in particular the regular cycles of the seasons as driven by sun and moon. It is probably not an exaggeration to state that the agricultural societies that emerged after the Neolithic Revolution were obsessed by the measurement of time and by attempts to control and predict the future - the seasons first of all, but many calendars measured time on a much larger scale.

#### 5. Time after time: expectations about the afterlife as determinant of behaviour

That such societies gradually developed ideas about the future is also clear from the development of the concept of ‘afterlife’. By its very nature the afterlife is unknowable, but this did not stop societies to develop very explicit ideas about this ‘future-after-death’, as is clear from the increasingly complex preparations they started to make for the transition to this next stage. In Egypt, for example, this aspect of religion resulted in mummification of the death, the building of elaborate graves, and highly complex rituals surrounding the burial (to name only a few aspects). A large part of the cultural heritage of the Egyptian civilization is related to these beliefs – in other words, during their lifetime wealthy Egyptians invested a large part of their surplus in structures (such as Pyramids or monumental graves) that had to smoothen the transition from life to afterlife.

But the idea of afterlife was not unique to Egyptian culture – in Hinduism and Buddhism there is a similar notion of the eternity of the soul which is subject to cyclical return in various forms, and Christianity and Islam both have clear notions of a heaven (and a hell) where the life after this life will be situated.

Such religious visions could have a strong impact on human behavior. Perhaps no society was more obsessed by these ideas and so full of images of such a future as Medieval

Europe. The Catholic Church was highly effective in communicating visions of heaven and hell (painted quite vividly in many Medieval Churches), the last judgement and purgatory. The latter was an intermediate stage where the souls pay for the sins committed – but this stage of afterlife could be shortened by a just life, by active praying by the living and by buying indulgences from the Church. Apparently, such ideas were quite effective in changing the behavior of the believers: they donated parts of their wealth to the church and related institutions, and for example in that way funded the building of the great cathedrals of Western Europe. This made it possible to construct a dense and rich religious infrastructure in a relatively short time period. Indulgences became really big business in late Medieval Europe, and their intense commercialization was seen by Luther as one of the most extreme excesses of the early 16<sup>th</sup> century Church.

Economic historians have not paid much attention to such drivers of social and economic decision making. In his ‘the Birth of Purgatory’ Le Goff (1984) for example traces the idea of such a stage in afterlife and its adoption by the church, and speculates about its social context, but he does not deal with the long term consequences of this doctrine (adopted in the 12<sup>th</sup> century). Gary Richardson’s (2005) study of the rise of the guilds in medieval England is the exception here: he characterized the belief in purgatory as a ‘disciplining device’ that made possible complex forms of cooperation such as the guilds. But it is striking that this hypothesis has not been taken very seriously by the guild of historians of the guilds. It is a moot point whether we can really understand the great societal changes of the High Middle Ages – the ‘bottom up’ wave of institutional innovations of which the guild was only one example – without taking into account the socio-religious (or ideological, if you like) dimensions of the changes in behavior that were required for it. That the Church played a large role in these developments, is now generally acknowledged, but it is seen as a ‘neutral’ actor which only pursues power and wealth (and hence, for example, manages to introduce taxes – as the famous tithe on the harvest; or challenges the power of lay kings and emperors, as in the famous investiture controversy). The European Middle Ages are now often also identified as the birthplace of (European) capitalism, as we see, perhaps for the first time in history, societies emerge which are almost entirely dominated by markets, including markets for labour, capital and land (Campbell 2016). These changes were made possible by the wave of institutional innovations which preceded them; why this period – and in particular the years between about 950 and 1200 – was so productive in institutional renewal is still a bit of a mystery (De Moor 2006). Perhaps the changing time horizon, as suggested by Richardson, has played a role in this transformation.

In terms of interest rates, used in economic decision making to discount the future, the Middle Ages also saw striking developments. In particular after the Black Death interest rates on capital markets in large parts of Western Europe fell to levels – 5% to 6% annually - unprecedented in history (Van Zanden 2009). The usual explanation is that capital per head of the population increased after the sharp decline in population levels due to the Black Death of 1348, but this can only help to explain a temporary decline – whereas in fact it was quite persistent. The efficient institutional framework created for market exchange – including borrowing at capital markets – must also have played a large role, as the low interest rates continued to be a feature of European economic development ever since. But the low interest rates also reflects the fact that in economic decision making people weighted the future more than in previous societies – at some deeper level this accords with the religious focus on the long term.

Of course, Weber’s classic hypothesis (Weber 1905) that the ‘Protestant Ethic’ was conducive to the birth (or development) of capitalism fits into a similar frame. The argument is that in particular Calvinists, who believe in predestination, seek confirmation of the fact that they are among the chosen by working hard, by being disciplined. If such behavior was rewarded by material success, this was interpreted as a sign that one was actually saved, Weber argued. Again, expectations about the afterlife affect behavior towards saving, investing and patience.

## 6. Capitalism and the managerial revolution

Perhaps it is not a coincidence that medieval and early modern society, where at least some people were preoccupied with the long term consequences of their behavior, an economic system emerged that was in a way focused on the long term. A first sign that the future mattered in economic decision making in this period is related to interest rates – which, as we saw, indirectly reflect the degree to which actors value the future. When interest rates are low, say 5% (a level reached already in the late Middle Ages) it means that people with money are prepared to lend out their cash at such a rate. In other words, that they are apparently happy with a 5% remuneration for postponing consumption for a full year. This 5% is, in historical perspective, quite low; in most historic societies for which comparable data are available, interest rates are usually much higher, and even in the contemporary world 5% is (or rather was, before after 2008 artificial monetary easing distorted the picture) quite low.

Capitalism also required long-term investments in fixed capital. Marx summarized this aspect as ‘Accumulate. Accumulate. This is Moses and the Prophets’. One of the means to realize this was the use of a concept that had been developed in the Middle Ages – the corporation – to economic activities. An archetypical example was the VOC.

One of the ways in which ‘western society’ achieved behaviour consistent with a long time horizon is via the setting up of ‘corporations’, institutions which transcended the life cycle of its participants and were in a way ‘eternal’. The Church is the perfect example, but Medieval Europe saw a proliferation of the corporate model: communes, monastic orders (and monasteries), brotherhoods, guilds. Such organizations were made possible by the convergence of the (short term) interests of their members, with the long term interests of the institution. For example, members of the clergy, for example, were interested in increasing the resources and status of the Church, as this also raised their status and income.

The business corporation meant the transplantation of this idea to the commercial sphere. There are earlier examples which fit this ‘model’ (Tuscan banking firms in the High Middle Ages – although the family element was still quite strong there), but the VOC is generally considered the first ‘classic’ – and highly influential – joint stock company. Before 1602, when the company was launched due to a charter by the Estates General of the Dutch Republic, trading companies were put together by merchants and capital owners to finance one or several trips. The charter gave the new corporation (which was in fact also a merger of a number of earlier companies with such a limited duration) for a period of 21 years the monopoly on the trade with the Indies (with an option to dissolve the company after ten years). Due to the particular nature of its business, and because the Estates General saw the company as an instrument in the fight against Spain, it had to invest in ‘infrastructure’ with a much longer lifespan: it conquered strategic trading posts and port cities (at the expense of the Portuguese and Spanish possessions), built fortifications and warehouses, and created a commercial network that required extremely high maintenance costs. Such investments could not be recouped after ten years, or sold and liquidated after the charter expired. As Gelderblom, De Jong and Jonker (2013) have shown, the creation of ‘permanent’ corporation with an extremely long time horizon was not the result of its initial design, but resulted from the economic and military-strategic necessity to operate a company under such conditions. The managers of the company, the *bewindhebbers*, were the driving force behind this transformation, but they met with fierce opposition from some of the shareholders, in particular Isaac Le Maire, who led a syndicate that went short on VOC shares at the Amsterdam Stock Exchange in order to force the managers to change course. The

*bewindhebbers* defended their long-term plans, which also implied that profits were reinvested in the company, whereas Le Maire favored the paying out of a dividend. The news of this secret syndicate leaked out, however, and Estates General took steps to further strengthen the position of management. Shareholders could hardly influence their decision making, but the emergence of a market for shares of the company created the option for exit. In this way the joint stock company combined the interests of shareholders in an investment with high liquidity (and high yields) with the creation of corporation with a much longer time horizon.

### The rise of big business

The VOC remained an exceptional case, however, in a developing capitalist world in which family firms and other forms of partnerships dominated. In the 17<sup>th</sup> and 18<sup>th</sup> centuries the experiences with joint stock companies were on balance rather negative, as many were the result of speculative waves, such as those linked to activities of John Law and the South Sea companies in the early 1720s. Most of the ones that emerged focused on capital intensive projects with a societal role, such as the building of canals and railways. Apart from that, many forms of cooperation existed between entrepreneurs enabling them to perform larger project and activities. In particular these forms used family capital or capital from nearby friends,

The period after 1848 is often seen as a period of the rise of capitalism, during which a new type of firm emerged, first in the US during a merger wave, and later also in Europe and elsewhere in the world. Alfred D. Chandler, a famous American business historian, analyzed this rise of big business with its managerial hierarchy and multidivisional organizational structure for a few large American companies, such as DuPont, Esso, General Motors and Sears, Roebuck & Co (Chandler 1962). Thus, with the second industrial revolution (1880s) a new organization led by professional, paid managers emerged. One of the requirements for the creation of a successful (that is long term) business, he argued, was three pronged investments in production, marketing and distribution, and in management. So firms had to invest in production to achieve cost advantages of scale and scope. Also the firm has to build an organizational hierarchy by investing in marketing, including distributing and R&D. Lastly, he stressed the importance for a firm to have a team of managers who coordinate the different departments of the firm efficiently. Based on these findings Chandler stressed that the invisible hand of the market (see Adam Smith 1776), was replaced by the visible hand of managerial hierarchy (Chandler 1977) referred to by Chandler as the managerial revolution.

The long term investments reflect an increase in time horizon of these managers. So with the rise of managerial capitalism so did time horizon and time preference. They invested rather in their firms hoping to get a leadership position in their respective, often capital intensive, branches, than paying higher dividend to shareholders. So within firms, the balance shifted to investing in assets enabling firms to grow (long horizon) instead of paying higher dividends to shareholders.

Big business was the driving force of the golden years 1950-1973. Large diversified firms were characterized by increasing complexity; something that had to be efficiently coordinated and managed. Strategy became an important concept in this respect. In 1959 Peter Drucker already stressed the importance of long range planning. According to him: “To say ‘long-range’ or ‘short-range’ planning implies that a given time span defines the planning: and this is actually how businesses look at it when they speak of a ‘five-year plan’ or a ‘ten-year plan’. But the essence of planning is to make present decisions with knowledge of their futurity. It is the futurity that determines the time span, and not vice versa” (Drucker, 1954, p. 244). Thus long-range planning requires knowledge of futurity. “What do we have to do today if we want to be some place in the future?” and “What will not get done at all if we do not commit resources to it today?” Drucker also shows that time spans are not static; the time span of strategic planning had increased since the 1880s, he argues, so that in the 1950s in general managers take ten to twenty years risks. So, the decision on the time span is a highly important risk-taking decision in the planning process of a firm. Time had become an essential factor in decision making.

However it was Chandler who stressed the importance of strategy as a rational process based on analyses and calculations to reach profit maximization in the long run (Karsten and Van Veen 1998). Efficient coordination was only possible when the managers of a firm had a clear strategic concept. The new ideas were spread around the world by American management consultants; McKinsey and the Boston Consulting Group being mostly well known. In the Netherlands Shell was one of the first to create a strategic planning department.

The oil crisis in 1973 showed painfully that long term planning not always fitted sudden external events. As a result the usefulness of these concepts was increasingly being questioned. Shell for example started with a new technique which was called scenario planning. It did so in the mid-1970s with the help of Herman Kahn from the Hudson Institute. This technique analyzed the major forces at work, how they were related to each other and what the possible consequences would be. The main difference with earlier strategic planning



was that scenario planning did not try to forecast , because it appeared that the future was unpredictable. Rather several possible futures were drafted (Sluyterman 2007, p. 222-223). Still it was also meant for firms to plan in the long run.

### Family firms

According to Chandler the emergence of the managerial enterprise was the driving force of modern industrial capitalism. With his generalizations other organizational forms such as networks of firms and family firms were portrayed badly. In his third book (1990) in which Chandler compared the US with the United Kingdom and Germany, he stated that the UK had failed to be successful in the important sectors the second industrial revolution, such as chemicals, oil and machinery industry. He blamed the dominance of family firms in the UK for this (“personal capitalism”); family firms were not able to make the essential three pronged investments in production, distribution and management. Related to his and more importantly in the context of long termism vs short termism, Chandler argued that family firms’ goal is to provide a steady cash flow to its owner-managers. Because family firms preferred short term income above long term growth, relatively high dividends were paid out whereas retained earnings remained low. He argued that professional salaried managers were better able to withstand owners that wanted high dividends than managers who were part of the ownership family (Chandler 1990).

However, other research shows that family firms, compared to non-family firms, put more importance on continuity. It is the reason why family firms, in contrast to what Chandler stated, are characterized by a long term orientation. This longer time horizon is due to the general desire of family firms to pass on the firms to the next generation, and it has an impact on investment and structuring decisions. For example Hoopes and Miller (2006) found that family firm managers are more willing to sacrifice dividend payouts and short term financial goals in favor of continuing investments and long term results. In other words there is a strong stand of literature arguing that family firms have a desire to pass the firm on the future generations leading them to think long-term. Also the CEO and senior managers of family firms seem to have longer tenures and thus greater interests in the firm’s long term performance (Zellweger 2007; Le Breton-Miller and Miller 2006; Miller and Le Breton-Miller 2005), which might encourage an incentive for investments in long term projects such as R&D.

Family firms in general can be characterized as having both financial goals (profits, market share, efficiency) and non- financial goals (family harmony, family employment

opportunities, corporate independence, cross generational sustainability and management succession). Family firms will take both types into account when making strategic decisions (Kellermanns and Hoy 2016).

#### 7. Shareholder revolution and the rise of short termism in business

From the above it has become clear that firms faces dilemmas in decision making concerning long termism and short termism. So firms can pay out dividends, resulting in short term rewards for their owners, or it can use the capital to finance investments in new technologies, resulting (probably) in long term growth. It is important to stress here that short termism in itself is not a problem, but is becomes one when executive managers sacrifice long term goals and only concentrate on short term outcomes.

In the early 1990s it became apparent that US firms had a comparative disadvantage compared to German and Japanese firms. Concerns about the competitiveness of American business generated a new stand of literature. Thus, only two years after Chandler's much debated *Scale and Scope* (1990), Michael Porter argued that this underinvestment of American firms (in for example R&D), was due to the short term relationship between the firms and their external shareholders. He showed that 60% of the shares was owned by institutional investors. They possessed highly diversified investment portfolios with only a small share in each firm. He contrasted the American with German and Japanese firms and concluded that the latter had "dedicated owners" who hold significant stakes in the long term (Porter 1992). Triggered by the possible failing behind of US business, the National Academy of Engineering formed the Committee on Time Horizons and Technology Investments in the early 1990s. Its main task was to explore the determinants of investment time horizons by American technological firms. The report that the Committee produced showed among other things that there was a wide range of influences on corporate time horizons, one of them being the abilities of executives managers to deal with uncertainty; another the expectations of investors, yet another the design and implementation of government policies. It implied that "no single actor can unilaterally lengthen investment time horizons" (NAE 1992),

The prevalence of short termism within firms became to be known as the shareholder revolution, and spread to large parts of the world. Short termism is in particular visible in listed firms, which are under pressure of shareholders to perform in the short run. One important factor, as already expressed by Porter in the early 1990s, has been the increasing role of institutional investors, which often have only small stakes in many firms (see e.g.

Westerhuis and De Jong 2015 for the Dutch case). Globalization and technological progress (e.g. internet) have resulted in lower transaction costs. Thus investors can easily transfer their capital from one company to another, or from one market to another, and from one country to another.

#### Agency theory, the underlying model for short termism

The shareholder model can be analyzed as a technique as well as a normative belief structure. Considering the model merely as a technique implies firms focus on certain types of practices or strategies. Thus this kind of research focuses on for example how firms allocate sources differently by paying out more dividends, leaving less capital for innovation. Or how firms embrace the strategy of lean and mean by cutting employment and/or sell non-profitable business lines. This line of literature in general considers changes in the (international) product and capital markets as the main drivers for the change to short termism. Thus for example financial economics considers the diffusion of the shareholder model as driven by increasing competitive pressures in international capital markets and/or product market pressures.

On the other hand the shareholder model is not just seen simply as a single technique or practice. Instead corporate governance models such as shareholder model can be considered a normative belief structure about the allocation of power (see Fiss and Zajac, 2004 ). This is based on institutional theory which researches how values, norms and beliefs constitute reality and influence practice (Bezemer, p.87). This viewpoint implies that additional factors (political, societal) might play a role as well. Although some of these institutional theorists have analyzed the adoption of new practices into a different institutional context, they still debate how and why these practices spread over different institutional environments with different norms and values.

When acknowledging the shareholder model as a normative belief structure, apart from being a practice or technique used by managers to satisfy shareholders, it is interesting to see how agency theory, which is the underlying theory or idea of the shareholder model, came about. Agency theory, stating that shareholders of a firm are the principles and managers their agents, has its roots in the US during the 1970s (Fourcade and Khurana 2013, 148-149). An important condition for its emergence has been the transformation from finance to financial economics (MacKenzie 2006). Before at American universities the discipline of finance had been rather descriptive and institutional, with the firm as the main unit of analysis. But this focus has changed since the mid-1960s. As a result, by the 1980s financial

research was mostly based on mathematics and statistics; financial markets, not firms, became the central unit of analysis. Traditional finance was “beaten” by financial economics based on the assumption that the former was unscientific which would lead to inefficient management. Arguably, Chicago GSB is seen as the intellectual center for the development of financial economics. Here the approach to finance resembled Chicago economics, with a strong belief in the free-market being superior to firms in the efficient allocation of sources, and interested only in the “predictive power of theory” (MacKenzie 2006, pp 55 and 71).

The most well-known product of Chicago financial economists has been the efficient market hypothesis developed by Eugene Fama in 1970. Fama (1970) defined an efficient market as one in which security prices always fully reflect available information. It is therefore the best reflector of the firm’s economic value. The efficient market hypothesis had huge consequences for the way firms were seen and managed. The theory was rooted in Milton Friedman idea that the ultimate goal of a firm was to maximize financial value. Combining the two theories provided the justification for new developments: the market for corporate control; performance based pay; and focus on increasing shareholder value. The theory gave a rationale for corporate strategy and policies that would discipline the manager in line with the shareholders goals. The direct cause was that conglomerates in the US that had diversified in many different activities during the 1960s came into trouble in the 1970s. According to the theory they were destroying value for the shareholders. Therefore, they argued, the market for corporate control was a good thing as it could discipline the manager. It gave an ideological basis to the M&A wave that hit the American market in the 1980s. Second, the theory gave an argument for compensating directors based on stock performance. And thirdly, as it was stated that stock prices reflect the economic value of a firm, directors should exclusively focus on increasing the stock price. Thus, a financialized mode of corporate resource allocation has been legitimized by the ideology that business corporations should be run to maximize shareholder value. One strategy for manipulating firm’s stock price is stock buy backs (see more for US Lazonick 2012, p. 880 ev). Paradoxically, because of stock based compensation, managers are themselves major beneficiaries of this focus on rising stock prices as the most important measure for corporate performance ( Lazonick 2012, p. 859).

These three ideas became to be known as ‘agency theory’. Important to stress is that “the core ideas of agency theory were derived not from inductive observation and practical experience but, instead, from the theoretical musings of a newly revitalized neoclassical economic theory” (Fourcade and Khurana, 2013, p. 151). Thus, economists had brought a

deductive, theoretical approach to business schools. And “drawing on the legitimacy of economics, agency theory had the authority to redefine managerial action and the nature of the corporation.” William Meckling and Michael Jensen, both graduated from the University of Chicago and agency theorists, played an important role in the spread of the ideas, both among academia as in the press (see for more details on the spread of these ideas: Forucade and Khurana 2013, p. 151-153).

#### 8. The rise and decline of ‘modernity’

We have just sketched, for business, the rise and decline of long-termism (and the emergence of short-termism) in the past 150 years. It may perhaps be suggested that this development had deep ideological and philosophical roots, which we can only mention here. The rise of shareholder value was, we think, only one part of a much more complex change in the way western societies have imagined the future. The 1960s were arguably the high point of the ‘modernistic’ belief in the malleability of society and the predictability of the future. These beliefs were part of the inheritance of the Enlightenment, and based on a rather mechanical view of reality: the various dimensions of reality could be measured, causal relations could be established between them, and these could be projected in the future in order to predict what was going to happen. Paradoxically, it was believed that actors – governments or business for example – could also change reality, by (for example, in the words of Jan Tinbergen, the pioneer of economic modelling) manipulating ‘instrument variables’ (interest rates, government expenditure) one could realize certain targets (growth, full employment) and in that way change the future. These ideas also underpinned the ambitions concerning economic planning that had emerged in the first half of the 20<sup>th</sup> century, such as the famous Five Years Plans that created the framework for the industrialization and structural transformation of the economy of the Soviet Union (the first one was launched in 1928), and the similar Four Years Plans of Nazi-Germany. As we saw already, in the business community there was a similar tendency to plan and look ahead, which for example manifested itself in the development of scenario-planning by Royal Dutch Shell.

The high tide of modernism – of a belief in the rationality of man, the unbiased nature of his/her knowledge about society, and therefore the ability to predict and change the future – has passed, however. The underlying assumptions of the Keynesian model which was probably the best representative of this trend, were seriously questioned during the 1990s; in particular by Lucas’ ‘rational expectations’ hypothesis, which pointed out that in order for

Keynesian demand management to change the future people had to act irrationally. Similarly, the collapse of centrally planned economies after the fall of the Iron Curtain in 1989 exposed the fact that this ‘rational’ attempt to control and steer the economy in a certain direction, had only lead to high levels of inefficiency and a low standard of living of the population (whereas ‘unplanned’ capitalism in the west had performed far better). Similar changes happened in business, where the belief in Chandler’s centrally planned ‘multi-dimensional’ company which was able – due to the superior abilities of its management – to dominate large parts of the economy, waned after the 1970s. The diversification strategy, for example, which had been at the core of this belief and had dominated business strategy of most multinationals in the 1960s and 1970s, was abandoned during the depression of the 1980s. It was succeeded by a movement to downsize big companies, via outsourcing, the splitting up of big units etc – a movement that as we saw already was linked to the interests of shareholders.

In a way, the modernistic beliefs of the 1960s culminated in the famous ‘Limits to Growth’ report for the Club of Rome, authored by professor in ‘systems management’ Dennis Meadows, who developed a global model about the interactions between population, economic growth and pollution, predicting that real resource scarcities would soon put an end to economic growth and lead to a Malthusian population crisis. The debate is still open if these expectations have become reality since. The oil crisis of the 1970s which ended the long period of very cheap energy prices, suggested that the limits to growth had been reached, but one can argue that other parts of the doomsenario have failed to materialize.

The change from modernism to post-modernism is perhaps most apparent in the US. In the 1960s and 1970s it was leading the world in thinking about the future (futurology was a growing branch of scientific research). But due to a number of developments, the authority of scientific research has gradually disappeared; the fact that we are witnessing man-induced global warming has become ‘just another opinion’. Commercial interests may have played a role in this movement – big companies supplied money to ‘scholars’ who ‘showed’ for example that smoking was not bad for your health, or that global warming did not exist, and if it existed, was not caused by human intervention. There is a deeper change taking place as well, however, which is difficult to explain, but the undermining of the scientific basis for ‘imagining the future’ by post modernism and populism means that obvious facts (‘the earth is getting warmer’) can simply be denied by politicians (and academics). This ‘disimagining’ of the future seems to conflict with the theories we have reviewed about the degree to which societies/humans evaluate the future, that stress that increased wealth and longevity are supposed to contribute to a greater appreciation of the future. One solution of this paradox is,

perhaps, to note that the rise in wealth and longevity has been distributed highly unequally (in particular in the US) which, for those that did not profit from growth and globalization, may mean that they cannot share the vision of the future anymore that is dominant among the elite. Because the elite is concerned about global warming, the anti-elite beliefs that it is a hoax, ‘invented by the Chinese’ (as Trump remarked). But if this distrust in the results of academic research is only a matter of distribution is unclear – perhaps deeper movements (the end ‘modernism’?) play a role here as well.

## 9. Conclusion

This paper has tried to explore the topic of time preference and time horizon. This is highly relevant, as ‘patience’ is arguably an important determinant of the wealth of nations, and the interests of future generations which can only be taken into account if one is prepared to take the future into account, play an important role in debates about the transition towards a sustainable society. Sustainability requires a very long time horizon and much patience.

There are certain spatial patterns in time preference – most clearly measured probably by recent survey research by Dohmen et al. (2015) – the explanation of which is an important nut to crack in future research. Cultural explanations in combination with economic and demographic determinants (income levels, longevity) probably have to be combined to fully explain the patterns found. This paper has concentrated on long term trends in time preference – or rather hypotheses thereof. The transition to an agricultural, settled society – the Neolithic revolution – probably already ran parallel with an important extension of time horizon. How powerful the effects of ‘imagining the future’ are on human behavior is clear from the place the afterlife plays in many historic societies. As the case of Medieval Europe demonstrates, it is possible to create an institutional framework – in this case dominated by many corporations with an near eternal life and corresponding time perspective – that ‘guarantees’ the long-term, afterlife interests of the population. The rise of big business – starting with the VOC as a very early pioneer – created a similar layer of corporations in the economic sphere of which the managers were in particular focused on the long term. The rise of a managerial class (again the VOC is an early experiment) strengthened tendencies towards long-termism in economic development. At a perhaps deeper level, the Enlightenment idea that we can (quantitatively) understand reality, including human society, and model the future, also gained appeal and became the ideological starting point of many attempt to plan and change the future (from Keynesian demand management to communist central planning).

But since the 1960s and 1970s long-termism is on the retreat, or so it seems. Shareholder value dominates decision making in business, and managers have become the incentivized instruments to serve their (short-term) interest at the expense of the long term. The negative effects on firm performance and growth are well documented in the literature, but such rules of the game became embedded in the changing power structures of a globalizing world. Modernism gave way to post-modernism, according to which reality cannot be known, let alone the future predicted or changed. If this analysis is correct, long-termism is on the decline, whereas at the same time we need it more than ever.



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