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ORIGINAL PAPER

Social System Historical Modeling of Western Economies and its Implications for Eastern Economies

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Abstract

The two purposes of the research are (a) to develop an analytical model that views the economy/polity as a social system with interactive subsystems of actors: households, firms, government, political parties and other significant actors, and (b) apply the analytical model to construct and verify a timeline that figures major events in world development that shaped the evolution of the western economies, and the relative strength of their interacting subsystems. The timeline highlights the changing and evolving dominance of the major subsystems in the economic history of the western world. We differ from the convention of looking at history as the occurrence of exogenous consequential events and offer instead a system dynamics analysis that makes historical events endogenous and to be affected by the powerplay within the system. The current dominance of the firm subsystem in western countries is demonstrated to be the accumulated result of centuries of past events: wars, discoveries, colonies, trade, political enlightenments, and industrial revolutions that strengthened participation and interactions in the firm subsystem at the cost of weakened dominance of rival subsystems (those of traditional households, theocrats, manors, communes, royals, and the modern state subsystem). The behavioral orientation of a social system is explainable in terms of (a) interactive influence (which occurs during the participation and interaction of agents in multiple settings, with some settings having more interactive influence than others), and (b) regulative influence (where the conduct of the one subsystem overrules that of other subsystems). Western economic history suggests a positive conditional correlation and convergence between (a) and (b). Being conditional, the convergence between (a) and (b) may not hold in other world contexts, i.e., China, India, Arab and African countries.

Keywords Social systems · Economic history · World economies · Revolutions (industrial · political) · Dominance (business · State)

JEL Classification B12 · N13-4 · N20 · N41-4 · L50 · F60 · P16-9 · P51

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1 Introduction

Old proponents of social system modeling (SSM) would include Marx and Pareto. Later proponents include Parsons (1956) and Luhmann (1995). They share a trans-disciplinary framework in which the economic system is one functional subsystem, next to other functional subsystems of households and social groups, politics, law, education, science, theocracy, etc. These subsystems act and interact in forming together the whole societal system. Agents inhabit each subsystem and pursue specific goals characteristic to each subsystem. In its pursuit of fulfilling its specific goal, each subsystem functions by itself, sets up its organization, and adapts itself to other subsystems and the changing environment. The interactions of subsystems over time often lead to the dominance of one subsystem over other subsystems.

SSM is an offshoot of general systems theory and analysis, a cross-disciplinary collection of scientific thought in physical sciences that offers an exciting potential for systemic description and integration of separated theories into a single framework. It is generally acknowledged that while the general system approach has sounding successes in the physical sciences, progress of SSM in the social sciences has been slow.[1]

Building on previous work,[2] two purposes of the paper are to use the SSM approach in formulating a theory of social system dynamics and development, and to apply the theory in tracing major episodes in the economic history of the western world. Our SSM approach distinguishes between three main subsystems centered around, respectively, the household, the state and the firm. The agents in these three functional subsystems are driven by three distinct motivations, respectively, the social, the political and the economic motive. The paper uses this framework in tracing the changing and evolving dominance of rival subsystems in the economic history of the western world. The paper succeeds in giving a systematic, quantifiable, and verifiable holistic calibration of economic developments, and this contrasts with the narrower written accounts of economic history. We differ from the convention of looking at history as the occurrence of exogenous consequential events and offer instead a system dynamics analysis that makes historical events endogenous to the system in the sense that they are impacted and often caused by the powerplay within the system.

[1] The social system research program of Parsons and Luhmann failed to mobilize economists and other social scientists to rethink and integrate their fields of specialization along the proposed lines. One reason is that there is little communication between social science disciplines. Moving toward a trans-disciplinary approach requires the presence of conceptual frameworks with common principles that describe how the various subsystems operate and interact with each other to produce the whole system. The development of such conceptual frameworks requires, in turn, substantive organized cooperation and pooling of joint resources which are not there. Under the circumstances, it is generally more rewarding to keep to one's own discipline. The other reason is that while Parsons and Luhmann are to be accredited for launching the idea of SSTA, yet they did not have the time to go in length in formulating general principles, variables and parameters allow modeling evolution of subsystems and their interactions with each other in a whole system.

[2] Cohen (2009), and with further elaborations in Cohen (2014, 2015).

It is recognized right out that the distinguished contributions on the dynamic interaction of state and firms due to Schumpeter, Stigler and Galbraith, and on the historical rise of the state and markets in the works of Hicks, North and Williamson are cornerstones in the formulation of the SSM.

The paper is organized into three sections. Section 2 will lay out the modeling framework and illustrate its application. Section 3 will review the timeline of the changing dominance of rival subsystems in the economic history of the western world. Section 4 concludes and discusses applicability of the results in other contexts than the western world.

2 Conceptual Framework for a System Analysis

2.1 Behavioral Settings

Conventionally, a behavioral setting, call it *b*, is defined as a physical site populated by interacting persons who have become members of the setting by accident and/or choice. Behavioral settings relevant for economic analysis are those that generate for their participants added value from the economic transformation of production and/or exchange activity. Agents inhabiting a behavioral setting engage thus in a value-added transformation of goods and services. The actions of agents are subjected to physical-technological boundaries and guided by institutional rules and information schemes. Setting types of significance and interest for economic analysis are those of *household*, *firm*, and *state* settings, that is, *government*.[3] These three types of settings will be denoted by *h, f,* and *s.* Agent behavior and transformation processes in the household, firm, and state settings are driven by intrinsically distinct goal functions and reinforced by regulating institutions. For example, affinity sharing is the underlying intrinsic motive in household settings. Agents in household settings are united by kinship, ethnic, locality or religious ties and adopt initially institutions of reciprocal exchanges and the collective sharing of benefits and costs. In contrast, profit maximization is the intrinsic motive in firm and market settings, while acquisition of a polity rent and political advantages attached to the political intermediation are the intrinsic motives in state settings; in short, rent politicization.

2.2 Functional Subsystems

A specific subsystem, called *B*, consists of a vast number of behavioral settings *b* of the same specific type. Proceeding from the level of settings to the level of subsystems involves objectifying and depersonalizing the settings, turning them into entities, and supplementing these entities by supportive institutions that safeguard

[3] By state settings we mean the legislative and executive branches, i.e., government. The state subsystem does not include the judiciary, which is a separate functional subsystem. Though it becomes a part if the government is fully controlling the judiciary in the context of the country concerned.

the sustainability and expansion of the subsystem. [4] Accordingly, each subsystem *B* has its own institutional rules and information schemes for guiding actions of the agents present in that subsystem. We shall denote the subsystems corresponding with household, firm, and state settings, by capital letters *H, F* and *S,* respectively. Of course, there are other subsystems that are indirectly engaged in economic transformations that may have significant bearings on the economy. The role of other subsystems will be reviewed where relevant.

The goal functions are distinct and intrinsic for the three types of settings/subsystems. The intrinsic goal in the household subsystem is described as affinity sharing, and coordination mechanisms have a sociologic character. The goal in the firm subsystem is profit maximization and coordination mechanisms are economic in character. The goal in the state subsystem is rent politicization, and coordination mechanisms are political in character. The distinct behavioral motives of the three subsystems can be expressed formally in equational forms.[5]

Expanding on the above, in the household-communal subsystem, the motto of the *homo sociologicus* is most applicable: from whom according to his/her ability and to whom according to his/her needs, resulting in social sharing and committed reciprocity. The firm subsystem functions along the *homo economicus* where choices in production and exchanges are made to assure that material benefits less costs are maximized. From whom according to his/her abilities and effort and to whom in accordance with his/her relative abilities and efforts is the rule of the game. In contrast, the state subsystem is represented by the *homo politicos;* this is a state authority who brokers a settlement among insecure and/or differing parties in ways that guarantee security and resolve conflict peacefully, with simultaneously strengthening institutions that bolster power and protective rent for the state authority. The rule of the game in the state subsystem is close to what can be described as from whom

[4] Our modeling of the formation of subsystems draws on thoughts on interaction within social groups in Simon (1952), and on institutional growth in Zysman (1994).

[5] In the household setting, *h,* agents lump together their benefits and costs in an effort to make total benefits exceed total costs. In Eq. 1, V_h stands for the value added in the household setting, while rewards R and efforts E of agents i and i' are lumped together and somehow shared among all i.

$$V_h \equiv R_i + R_{i'} - E_i - E_{i'} \geq 0. \tag{1}$$

In the firm setting, *f* each agent aims at the highest economic returns to one self, which implies aiming at realizing the highest return to the firm as a whole, above an opportunity cost margin ρ

$$V_f \equiv \sum \left(R_i - E_i\right) / \sum E_i \geq r \tag{2}$$

To model the state setting, introduce the subscript *ps* to denote the pre-state situation (before engagement of the state), and subscript s to denote the situation after engagement of the state., and k to represent state agents Eq. 3 shows a lower value added in the pre-state situation compared to the situation with state engagement.

$$V_{\text{ps}} \equiv R_{\text{psi}} - \sum E_{\text{psi}} \leq 0, V_s \equiv \sum R_i - \sum E_i - \sum E_{\text{ik}} \geq 0 \tag{3}$$

Institutional rules in state settings give the governing agent, *k,* the exclusive authority to acquire a polity rent from all agents for the polity services rendered, denoted by $E_{\text{ik,}}$. Furthermore, institutional rules in state settings tend to be molded in manners that require prolonged dependency of agents, i, on agents with state authority, k, and collection of polity rent in the future if transformation is to be realized and maintained in future transactions.

according to his/her maximum negotiable ability and to whom according to his/her minimum negotiable needs. The difference between the two volumes is the polity rent that the state agent acquires.

While each subsystem *B* is in some sense a sum of its own constituent behavioral settings *b,* there is more to that than being a simple sum. The subsystems are self-functional wholes by themselves. Any of the subsystems engages in (a) establishing and applying internal rules of conduct aiming at eliminating free riding among members and securing the sustainability of the subsystem, thus leading to a deepening of the goal function of the subsystem; (b) acting to improve and expand the scope of the transformations in the face of emerging challenges.

Pioneering leaders within the subsystem level play major roles in initiating the above actions. Followers sustain these actions. Pioneers in the *F* subsystem are innovative, entrepreneurial, and risk takers, while pioneers in the *S* subsystem are state reformers and are highly devoted to public service. Finally, changes in the external environment open external opportunities that encourage pioneering as well as free-riding to take place. Events in the external environment impact significantly the expansion and exhaustion of the comparative advantage of a subsystem in activities that the subsystem is most suited to transform.

2.3 Systemic Influences

Subsystems influence each other, with usually one overgrowing and the others declining or growing but lagging. It is important to have a precise formulation of what we mean by the influence of one subsystem on other subsystems. Focus is on two dimensions of influence; *interactive influence* and *regulative influence.*

Interactive influence relates to the intensity of participation and activity of the agents in one subsystem relative to other subsystems. To start with, in any country there are active agents in households, firms and state subsystems in large numbers. The same agents can be members of more than one subsystem simultaneously. Agents communicate with other agents within their own subsystem and with other subsystems. The exchange of information and communication on performances of subsystems activates the realignment of agents toward the more promising (overgrowing) subsystem. This leads over lengthy periods of time to relatively greater concentrations of agents in the overgrowing subsystem, say subsystem *B* gains on subsystems *B'*, opening the way for the spread and dominance of the institutions of *B* over *B'*, and of the behavioral traits that coincide with those of subsystem *B,* over those of *B.'* Once a threshold is reached regarding accepting a specific behavioral type, say that of *B*, this can be expected to gain momentum in view of network externalities, and spread further to all other *B's*.

There is a vast literature on the adoption and spread of a particular behavioral type among many agents. Some six mechanisms of agent interactions, that may include overlapping, can be singled out as determining the formation of the common behavioral pattern, its spread and dominance. (1) Sharing of the same external environment and history fosters convergence toward a common behavioral type. (2) Agents observe the transformation outcomes in alternative settings and *move* to the

advantaged setting or *copy* its behavior thus resulting in the prospect that the typical behavior of the advantaged subsystem becoming prevalent. (3) Intensive and extensive interactions and communications of agents taking part in several subsystems are prone to extend the prevalence of the advantaged behavioral type that associates with the most growing and dominant subsystem. (4) Network externalities enforce convergence toward the advantaged behavioral type. (5) The deep-rooted social-psychological inclination of individuals toward consistency in their relationships and cognition ends up in adopting a positive attitude toward the preferential behavior of the dominant counterpart. (6) Other related mechanisms include imitation, convention, focal points, information cascades, reciprocal behavior, group learning, Markov chain inversions, melting pot, and power of dominant shares, among others.[6]

Of course, next to all the interactive mechanisms, external events and environments play major roles in strengthening or weakening the relative dominance of the competing subsystems, and thereby contribute significantly to speeding up or obstructing the convergence tendencies toward one integral system that associates with the dominant subsystem.

Summing up, the better performing subsystem attracts more agents from the less performing subsystems, gains interactive influence, and takes the lead in interactive dominance. Supported by the above interactive mechanisms, the lead is strengthened; and the behavioral motive of the dominant subsystem is likely to become the norm for the whole system in the long run. Thus, one subsystem is very likely to evolve into dominance, and the whole system tends to become identifiable with the dominant subsystem.

To drive the point in an approximative manner, it can be reasoned for example that in the USA, the high concentration of agent interactions in firms has allowed over time the goal of profit maximization (which is intrinsic to the firm subsystem) to overshadow the intrinsic goals typical of the household and state subsystems. Similarly, it can be reasoned that comparable assimilation processes tended to oblige agents in household and firm settings in Soviet Russia to follow a politicized behavioral motive typical of the state subsystem. As a result, all three subsystems in USA behave in ways typical of firm settings, while in Soviet Russia, they manifested behavior typical of state settings. [7]The above implies that agent behavior, institutional conduct and outcome performance of the whole system will tend to be relatively homogeneous and reasonably predictable. It is logical to expect high degrees of consistency and correlation between the sociological, economic and political aspects of a specific social system.

[6] See Bikhchandani, Hirshleifer and Welch (1998), Frank (1988), Goodin (1993), Schelling (1978), Brueckner and Smirnov (2004), and Simon (1993).

[7] The examples can be elaborated further. For instance, in the USA, the polity can be described to have adapted itself to the economy. Next to constitutional checks and balances, and an independent judiciary system, that keep state discourse in control, profit maximizing firms and utility maximizing agents have installed more institutions for controlling state conduct and bent the polity toward behaving along the same norm of maximizing economic returns. In contrast, in Soviet Russia, the polity can be seen as exogenous to the economy.

The interactive influence of subsystem *B* on other subsystems *B'* can be quantified using a *Dominance Index (DI),* denoted by DI_B. The index has two arguments: the relative share of agents of *B* in the whole system and the relative share of transacted transformations of *B* in the whole system. See Eq. 4.

$$\mathrm{DI}_B = (\omega_1 A_B + \omega_2 C_B) \tag{4}$$

In this equation, there are two share parameters that affect prevalence. A_B is the share of agents in subsystem *B*, with respect to all agents in all settings. C_B is the share of commodities demanded that are most suitably transformed in subsystem *B*, with respect to all demanded commodities. *Personal* commodities are most suitably transformed in firm settings. C*ollective* needs are most suitably transformed in state settings. Equation 4 proposes that the greater the shares of those agents and commodities associated with a particular setting, the greater is the probability that the behavioral type underlying this setting prevails over other behavioral types. In this equation, $\omega 1$ and $\omega 2$ are weights applying to these two shares, whereby $\omega_1 + \omega_2 = 1$.[8]

The dominance index, DI_B, is indicative of the interactive power of subsystem *B* over all the other subsystems *B'*. Quantification of this index can be done at lower levels (for specific firms within an industry, for specific industries within the whole economy, for specific agencies within the state subsystem). It can be applied also at higher levels, i.e., for individual countries within a world region or the world economy as an indicator of the relative influence of individual countries, see Cohen (2015).

Moving to regulative influence, this arises in a situation in which a behavioral setting *b* happens to stand higher in relation to *b'* in the hierarchy of settings; allowing *b* to set behavioral rules typical of *b* that other settings *b'* should abide with. In this way, the behavioral type of *b* overrides *b'*, allowing the further spread of behavioral norms of *b* at the cost of those of *b'*. The example is extendable to the level of subsystems. The origin of the regulative influence lies in the ability of the higher subsystem to impose binding rules of conduct on the lower subsystems. One example: the imposition of the regulated workday by firms on households had significant regulatory effects of the firm subsystem on the household subsystem. The other example: in regulatory terms, the state subsystem stands above the firm subsystem; though this is legally correct, state regulations of industrial activity can hide an indirect regulatory influence of firms on the sate in case of capture. Apart from quoting examples, it is not feasible to give meaningful quantifications of the degree of regulative influence as in the case of interactive influence. Quantification is obstructed by difficulties in standardizing diversified measures of state regulation

[8] The two shares are not independent of each other. For instance, C_f affects A_f positively in the long run, while when relatively more agents go in *f*, thus increasing A_f, the potential for demanding and producing the *f* type of commodities is enhanced, and thus C_f is influenced positively. In spite of the interdependence, the two shares stand for different aspects that feature the identification of the economic system. It can be expected that the two shares correlate, which is an argument for giving them equal weights in the simple aggregation equation.

across countries. Besides, the state regulations are robbed of their meaning in cases they are captured by firms.

While the dominant power of the firm subsystem in western countries has been the result of the past growth of interactive influence and is less the result of a regulative influence of the firm subsystem on other subsystems, it is generally believed that the accumulated power of state authorities consists mainly of regulatory influence. Economists have studied in depth the nature of the regulatory influence of the state subsystem on the firm subsystem, and vice versa, with surprising findings that are generally acknowledged. Stigler (1971), Joskow and Rose (1989), and Winston (1993) found that a very large part of the state regulations on producing firms is interpretable in terms of models of 'producer capture' and not of 'public interest.' Although the extents of the firm's manipulation of the state's regulations differ by sector and duration, the following hypothesis can be stated to be generally valid. In the country context, where the *F* subsystem is all dominant and the *S* subsystem is subordinate, such as in USA and less so in EU, the regulative influence of the *S* subsystem is for the greater part fake and capture. In contrast, in the past Soviet Union, where the state was all dominant, the regulative influence of the state on firms was absolute and real.

There are subtle differences between the interactive mechanisms and the regulative mechanisms. The interactive influence represents the results of *horizontal* integration. Regulative influence is a *vertical* relationship. It can be speculated also that the contribution of horizontal channels toward unified behavioral formation across subsystems is likely to be more influential and more permanent than that of vertical channels. Being generated via experiencing, learning and adoption horizontal interactions are likely to have more endurable effects. In the case of vertically accommodated behavioral attitudes, the regulative influence can terminate abruptly if the regulative mechanisms become too demanding due to technological loopholes, or the rationale for the binding restrictions disappears, or the balance of power between *b* and *b'* reverses. Furthermore, it is likely that there is a positive association between the two notions, in the sense that a subsystem powerful in interactive influence is also powerful in regulative influence.[9]

2.4 System Prototypes

In summary, agent mobility and communications between subsystems in the direction of the better performing subsystem, together with regulatory influence in the same direction end up in one dominant behavioral type typical of subsystem *B* over other *B'*. As such, the result is a homogeneous social system that can be approximately described in terms of the dominant subsystem, that is, *H, S or T. The* three figures below show the configurations of the system when the system is dominated by the *H, S* and *F*, subsystems, respectively. The dominant subsystem is in bold

[9] There is some evidence for OECD countries of a positive correlation between the degrees of public regulation and public spending. See Borcherding, Ferries and Garzoni (2002).

print, and its interactions with and impact on other subsystems carry more weight, hence their lines of communication are also drawn in bold.

Analysis of past records of world events should be able to answer such questions as to how the western society, has changed from a distant past where H dominated, as in Fig. 1a, to its current form which is most aligned with the F-dominant system, as in Fig. 1c. Internal and external events have brought about differential effects that favor one competing subsystem over other competing subsystems, and thus resulting in one dominant subsystem that shapes western society. As the next section will demonstrate, the external environments are continuously changing as world development moves on, causing intermittingly weakening effects and strengthening effects for both the *F* and *S* subsystems. It is sufficient to mention here a few examples to make the point clear. The ages of geographical discovery and colonial conquest in the fourteenth–seventeenth centuries strengthened both subsystems in Europe, though more so for *S* than *F*. The industrial revolution in the eighteenth–nineteenth centuries brought technological advances, which enhanced major diversifications in demanded private goods, a huge jump in personal needs of the newly settling migrating populations and a significant push for the firm subsystem. This period also saw the subjection of state governance to constitutional law, which in terms of

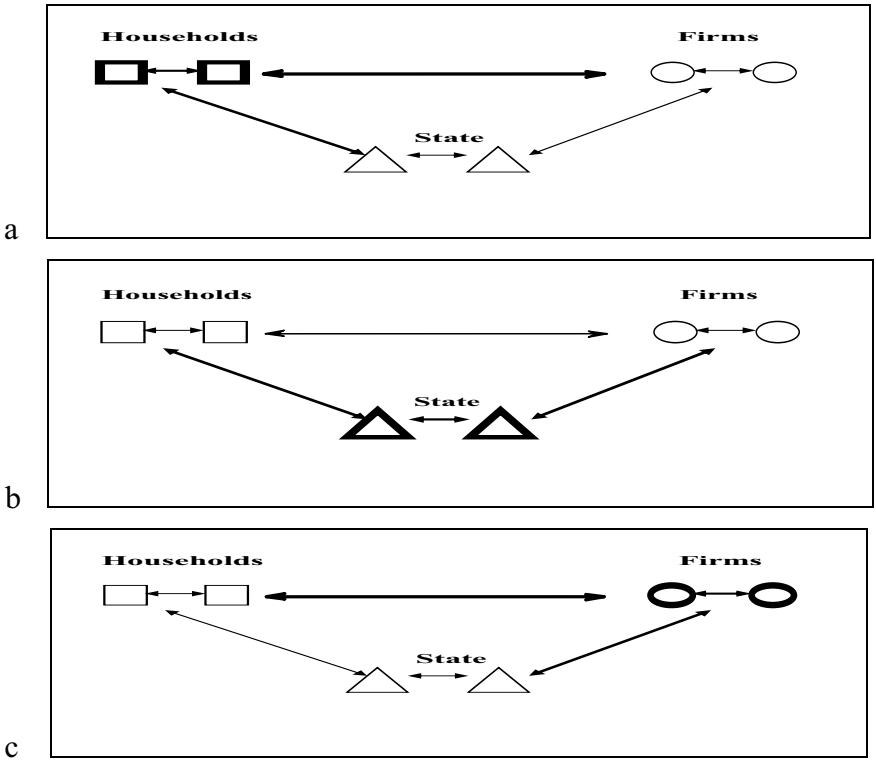

Fig. 1 **a**, **b**, **c** Configurations of three social systems: H-dominated, S-dominated and F-dominated

dominance, was equivalent to a downgrade of the state subsystem and an upgrade of the firm subsystem. The next section treats these epochs in some detail.

3 Historical Developments

3.1 A Timeline with Systemic Relevance

There is a vast literature on the economic history of western countries. Our concern is with the evolving spread of the firm subsystem at the cost of other subsystems: how historical events/changes strengthened the firm subsystem vis-à-vis other major subsystems and allowed the firm subsystem to eventually dominate the entire system.

The drive toward dominance of one subsystem over other subsystems is comparable to a long marathon race that goes through mountains and valleys. The chasing subsystems change positions as frontrunners, with some of the front running subsystems at one time losing strength or dropping out altogether centuries later. In Europe, the marathon began in a period of fragmentation and vacuum, around 900 or 1000 A.D. Once the race was started, the leading subsystem at the time (that of traditional household settings) experienced a continuous loss of agents and transformation to the benefit of rising subsystems. A spectacular gainer in the eleventh–fourteenth centuries was the theocratic subsystem (church and related settings), but this dwindled in later centuries. The feudal-lordship-manorial subsystem (an overlapping combination of feudal, lordship, and manorial settings) was another spectacular gainer in the tenth–fourteenth centuries but was destined to disappear completely five centuries later. The subsystems of manor law, urban communes and the central monarch started also in the same period, and it took them another five centuries of reformist and constitutional revolutions to evolve and fuse into the democratically elected state subsystem that is characteristic of western countries today. Small but rising in terms of agents and transformations were merchants and craftsmen. Although the trading, crafting, and cottage industry settings expanded with expanding markets for goods, labor and finance, it was only six centuries later, with the industrial revolution, that these settings developed into firm settings; and it took the firm subsystem two more centuries to evolve to their present dominant position in western countries. In the subsequent subsections, we fill out the details of this introductory paragraph.

Historical analysis commonly pinpoints specific years or periods as a starting point for analysis, though conditions in any year or period are the result of conditions in earlier years and periods. This makes it difficult to select a starting point. However, if one would replace the microscopic approach with a macroscopic perspective, and interpret history in terms of phases, the task is simplified. Historical evidence on Europe would indicate and justify the ninth–tenth century A.D. as a starting period for the marathon race. At that time the subsystem of traditional households and kinship related settings (i.e., villages and tribal groups) was still dominating the whole socio-economic and political system; in short, it was a household intensive system,

HIS. Berman (1983) gives an elegant description of the dominance of the H subsystem in Europe, at and before that time.[10]

The period of the sixth–tenth century experienced major upheavals. A series of territorial wars between the various tribal groups, peoples and territories in Europe was further exasperated by the external invasions from Islamic armies and failure to stop the defeat. The uncertainties and fragmentations of the time led to two important responses: one is the strengthening of religious settings (Christian church) and their regulatory influence on household behavior, and the other is the emergence of feudal settings (overlapping with lordships and manors) that embodied/subdued households. These two developments signaled the beginning of the end of the dominance of the household subsystem.

We draw in Fig. 2 a timeline for the evolution of the economic system of the western world that starts accordingly from 1000 A.D. to the present day. The timeline depicts events and effects, categorized in various epochs, which are relevant for our subject matter. The timeline shows subsequent ages of world development, some were inspired by thoughts (shown above the timeline), while others were driven by events (shown below the timeline). These world developments created and strengthened the firm and state subsystems, F and S, and added other subsystems, at the cost of the H subsystem. As will be shown, the accumulated gains for F were greater than for S. The timeline depicts four long periods, with earlier periods longer than latter periods. The first period is the genesis of the contemporary socio-economic and political system, it covers 400 years (1000–1400), the second covers 300 years (1400–1700), the third covers 200 years 1700–1900, and the fourth is years 2000–2014.

3.2 The Period of 1000 to 14,000

As was just said, uncertainty, fragmentation, and defeat in the sixth–tenth century were at maximum levels, the dominant traditional household subsystem already started to crack down, and newly emerging subsystems started showing their muscles. The eleventh–fourteenth centuries historically provided the right times for newly emerging settings to consolidate themselves into emerging subsystems and establish institutions that assure their sustainability. Foremost among the newly emerging subsystems was the theocratic subsystem. Christian churches more than multiplied in the eleventh and twelfth centuries.[11] The Christian Church was able to organize itself internally as a consolidated theocratic subsystem, subdue the power

[10] From Berman (1983): 'The earliest known legal orders prevailing among the peoples of northern and western Europe were mainly tribal in character. In the period from the sixth to the tenth century, on the one hand, the basic legal unit within the tribe was the household, a community of comradeship and trust based partly on kinship and partly on oaths of mutual protection and service. Violation of the peace of the household by an outsider could lead to retaliation in the form of blood feud, or else to inter-household or inter-clan negotiations designed to forestall or compose blood feud. On the other hand, there were territorial units consisting typically of households kinds of (feudal) lordship-household bonds' Pp.61.

[11] Buringh and Zanden (2006) estimate the average percentage increase of monasteries in the sixth to tenth century to be 49% per century, jumping to 91–64% in the eleventh and twelfth centuries, and there after falling to 17%, 6%and 4% in the thirteenth, fourteenth and fifteenth centuries.

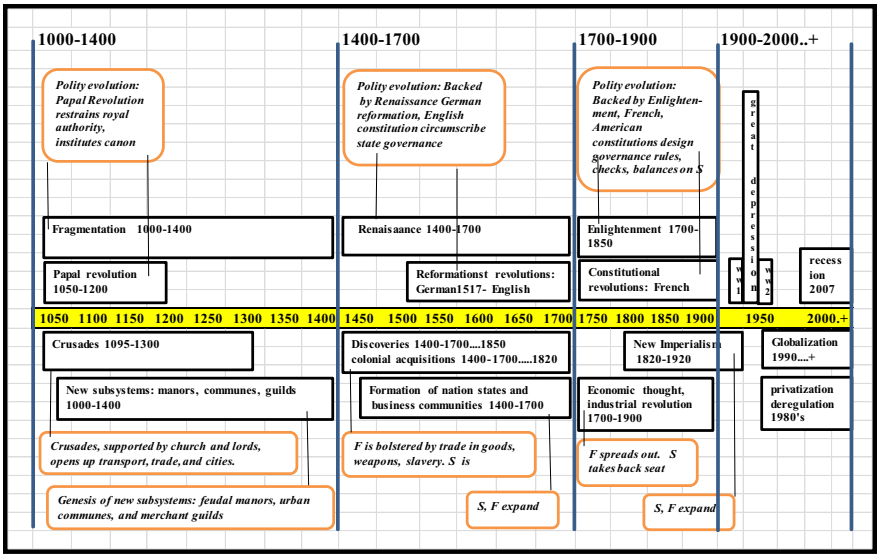

Fig. 2 Timeline of the firm intensive system in western countries 1000–2000 +

of the monarch in several respects, and dictate the course of the crusading wars; in what has been named the Papal Revolution. Another important subsystem that gained strength was the feudal-lordship-manorial subsystem. The joint occurrence of the crusading wars, economic growth and demographic expansion strengthened the rise of another subsystem, that of urban towns, merchants and craftsmen. Emboldened by the institutional successes of the papal and manorial subsystems, the urban communes and trade guilds started developing and organizing themselves as important subsystems, as well. Commune and guilds were intricately linked. Sometimes the establishment of merchants' guilds preceded a commune, and sometimes otherwise. We shall briefly review the rise and growth of these subsystems.

The theocratic subsystem. One can speak generally of Christian churches in their plural form, but in its singular form, the Christian Church encompasses and subjugates all churches, and develops unified codes of conduct for its subsidiaries and for participating household agents in what is known as the canon law. It was only in the eleventh century with the commencement of the Papal Revolution that the Christian Church organized itself as a coherent and unified theocratic subsystem and was able to exercise substantial influential powers on other subsystems. The Papal revolution consolidated the hundreds of churches, bishops, services and millions of worshippers in a holistic subsystem with adhered institutions, established canon law, wrote down property rights of monasteries in charters, instituted the *papal curia*, and delineated the independent authority of the Church from that of the monarch. *Dictatus papae*, initiated by Pope Gregory VII circa 1050–80, has been named as the Papal Manifesto by legal historians. It is based on the principles of papal primacy, and the conviction that the Church was founded by God and entrusted with the task of embracing all mankind in a single society in which divine will is the

only law; and that the pope, in his role as head of the Church, is the vice-regent of God on earth, so that disobedience to him implies disobedience to God: or, in the extreme, a defection from Christianity. The manifesto acknowledged the existence of the monarch as a dispensation of Providence, described the coexistence of church and monarch as a divine ordinance, and gave them the joint right to share the investiture of bishops. The manifesto demanded also the centralization of ecclesiastical government in Rome (all important matters of dispute referred to Rome, and appeals were to be addressed to the pope) and this meant the curtailment of the powers of bishops. The Papal revolution significantly impacted the evolution of European society. It revived compulsory celibacy among the clergy and gratis simony (payment to receive sacrament), promoted the significance of the written word in law and court proceedings, strengthened constitutional authority, made authority negotiable between power holders, and strengthened belief in the rule of law in guiding conduct and resolving conflicts. However, the narrow interpretation of the supremacy of the Papacy carried it with it weakening effects: it led to the estrangement of the Eastern Church, and would spark one century later the Protestant Reformation with significant weakening effects to the theocratic subsystem.

The crusade wars were a major world development of the time. The aggressive and reformist Papacy under Pope Gregory, went further than its assertion of independence from secular rulers to advocating holy wars to retake Palestine from the Islamic rulers. The first crusade in 1095 was followed by six major crusades, all of them sponsored jointly by the Church and various European monarchs and nobilities. Several hundred thousand Christian land workers from all over Western Europe were mobilized under feudal command, and became crusaders by taking vows and by receiving plenary indulgences. The majority of crusaders were poor people trying to escape the hardships of medieval life in an armed pilgrimage with a godly blessing and a promise that their sins would be forgiven. Taking part in a crusader war was seen as Christian redemption, and a form of penance that remits sins. It is comparable to radicalized calls for Islamic jihad.

Leaving the damage done by the crusades for what it was, of particular relevance for this paper is the impact of the crusades on the evolution of the socio-economic and political system in Europe, which was profound. The traditional household subsystem was overturned. Land cultivators left for the wars overseas, leaving control of their estates with regents, often wives or mothers. Recognizing the war risk to families and estates the Church organized special papal protection, which meant an accelerated influence of the theocratic subsystem on household settings, and a further decline of the traditional household subsystem.[12] The impact of the crusade wars on economic activities was even more significant. Recruiting and feeding hundreds of thousands of fighting soldiers required a special effort to enlist soldiers and to produce an agricultural surplus. The supply side was there and was able to

[12] Theocracy-driven adherence in the Middle Ages, which had the effect of undermining the household subsystem and family institutions, are not unique. Comparable ideals prevailed in the communism-driven adherence in the 20th Century with similar results in China, Vietnam, and some of ex-Soviet Union republics.

meet the increased demand. The result was a big push to economic growth, which raised demand and supply in subsequent rounds. The 11th to the fourteenth centuries experienced significant increases in agricultural acreage (due to forest clearance), increased agricultural productivity (through use of heavy plough, crop rotation, horsepower and water mills), and efficient exploitations of land and peasants by a feudal regime (that gained strength as a supplier of food and soldiers to the crusades). The period had fortunate climatic conditions as well. These factors resulted in an economic boom in the sectors of trade, transport, crafting and metal objects making, and a rise in rural–urban towns. The surge in population, though temporary, was an additional stimulus.

In the previous section, a measure of subsystem dominance was proposed. We postulated that the extent of interactive influence of subsystem *B* depends on the relative degrees of agent participation and of economic transformations that take place in subsystem *B* compared to other subsystems B**.'** Even though we do not have data on church attendance in the Middle Ages, this must have been very significant since church attendance was mandatory. Besides, the crusade wars increased theocratic participations in other manners as well. On economic transformations, it is interesting to note that historians estimate that the theocratic subsystem possessed in the twelfth century between 1/3rd and 1/4th of the usable land in main countries in Europe; with large portions of this land cultivated and governed along feudal-lordship-manorial rules, with appointed bishops functioning as custodians.[13] Taking all these data into consideration, the theocratic subsystem is likely to have been the strongest subsystem in economic terms in the twelfth century.

The feudal-lordship-manorial subsystem was likely the second in rank. The warlike environment, risks, uncertainty and fragmentation of the ninth and tenth centuries brought well off landlords and impoverished peasant together in a durable and influential network that spread further in the eleventh and twelfth centuries. The feudal subsystem was strengthened by the institution of manorial laws, which are conventions guiding the functioning of rural communities, usually biased to the advantage of lords on peasants. In the feudal subsystem in Europe, the monarch loaned land to vassals (i.e., lords, often belonging to nobilities) in exchange for loyalty and protection. At a lower order, the lords loaned land to their own vassals (i.e., peasants), and so forth. There were thus diverse levels of 'vassalage.' Lords and peasants shared a reciprocal relationship regarding legal, land and military obligations, cf. Reynolds (1994). The lord granted lands to peasant households in exchange for military service and working the land, while the vassals were ensured work, homes and protection. The nobility's class and feudal lordship often overlapped; in many instances they combined, but there were also landless nobles and non-noble feudal lords.[14] The feudal subsystem gained momentum with the crusade wars. It was the

[13] See Berman (1983), chapters 2 and 3.

[14] The feudal subsystem gained additional strength in territories where the monarchy was forced by nobilities to step down from exercising absolute power, a case in point is the passing of the Magna Carta in England in 1215. The Papal manifesto and Magna Carta, are often quoted as exemplary for power consolidation of the Church and for the nobilities class respectively, but also as recognition of the over power of the monarch).

main supplier of soldiers and food. But the growth of the feudal subsystem and manors began cracking in later centuries as social mobility among peasants increased and the bondage with land decreased (due to peasants getting crafting skills, higher earnings, buying their freedom, and moving to townships). Moreover, while in the eleventh–twelfth centuries, population grew, peasants were in abundance and remuneration was at a minimum; the thirteenth–fourteenth centuries experienced falls in the population due to famines and disease, labor shortages, and wage increases which led to a further weakening of the feudal subsystem.

Urban commune was the next newly emerging subsystem. Generally speaking, urban towns started from locations of weekly and permanent marketplaces and trading ports, and expanded further. Historical estimates of the urbanization ratio (share of the population living in towns with more than 10,000 inhabitants) show an average European ratio of 4.7% in the tenth Century. The higher growth of the economy and population pushed the ratio upward to 6.6% in the fourteenth century, with Italy at a highest ratio of 13.3%, cf. Bairoch et al. (1988). Back in the tenth century, town inhabitants in Northern Italy were the first to limit, regulate, and in some degree appropriate government for their town, which they did by establishing urban communes, also known as quasi-independent city-governments. In some sense, the urban communes can be viewed as the counterparts of the rural manors. Apart from the locational distinction, the two subsystems were completely different and rather opposites of each other in the way that they were formed and evolved. Rural manors were patron led, while urban communes were civil led, sworn associations of the inhabitants of a town, who in this way became true 'citizens,' to defend and strengthen the rights of the town. Councils and parliaments were an integral part of the organization of the commune, which showed quite a high degree of participation in the making of decisions, cf. Hyde (1973). By the middle of the twelfth century, almost all cities in Northern Italy were governed by more or less independent communes and recognized as such by various charters. City communes spread to France, Flanders and Netherlands, and later to most European cities. City communes gradually became the standard form of local governance. In England, the spread of local governance was less forthcoming due to the greater power of the monarch and knights at the national level. In time, the decentralized and centralized forms of governance at respectively the local and national levels evolved, changed and combined to form roots of the contemporary modern state settings and the state subsystem, S.

Trade guilds formed the other major subsystem that emerged in the period. The crusades required production and maintenance of transportation means on land and sea, costumes, metal weapons, and related tools, which meant an enhanced role for traders, transporters and craftsmen and an emphasis on acquiring skills and training apprentices. Merchant and occupational guilds came into being in these years. A trader handling his trade setting in isolation from other trade settings was in a weaker position than when he was part of an established subsystem comprising other trade settings. This would allow for property rights to be recognized and transaction costs to be reduced. Against these benefits that accrue for the trading participants in the self-organized subsystem, the trading participants complied with the conventionally institutionalized codes of conduct; the same applied for craft guilds. The codes of conduct included such directions as delivering the right goods, paying debt as agreed

upon, ensuring quality control, training apprentices, observing regulated prices, and prohibiting free riding, cf. Greif (2006). As trade and travelling increased, road piracy increased. This prompted lords to employ armed guards for protecting traders, in exchange for fees; which set in motion the introduction of standardized currencies that propelled the exchange economy further. The trade and craft guilds formed the seeds of the firm subsystem, *F*, which became dominant in later centuries. Traders obtained additional pushes from enactment of commercial laws that increased trust among traders, institution of common means of payment, the reopening by the crusades of the Mediterranean to trade and travel (enabling Genoa and Venice to flourish as trading centers, and promoting the commercial motive of making some profit to keep their business running). Furthermore, the opening of the Mediterranean was a necessary preparatory phase for the age of discovery which came two centuries later, and was essential in expanding the *F* subsystem.

Summing up, leaders of behavioral settings of the same type, whether they belong to churches, manors, merchants, craftsmen or city notables tend to collaborate with their own counterparts and form a subsystem that regulates their intra- and interactions and protect their rights viz a viz outsiders. All settings of one type are better off when they are members of the subsystem that encompasses that type. Strictly speaking, a subsystem goes a step further if it formally establishes itself as one single juridical entity and becomes lawfully recognized as such. In terms of institutional governance, already in the twelfth–fourteenth century the following juridical institutions were established: feudal laws, manor law, urban law, mercantile law pertaining respectively to the subsystems of feudal-manor, urban communes, and merchant guilds.

3.3 The Period of 1400 to 1700

Renaissance and the reformist revolutions. After reaching their climax in the twelfth century, the grip of the Papal revolution and the supremacy of the supernatural began to diminish in the thirteenth century. Reliance upon absolute faith weakened. Gradually, interest in promises of the afterlife started shifting toward interest in the here and now. Besides, after a lengthy period of warfare and crusades and of cross-cultural interaction and fertilization, the Renaissance came in as an age of peace and reflections. The Renaissance, or re-birth, began in Florence, Italy, several decades before 1400, and spread later to the rest of Europe. Historians are flexible in defining the timing of this age, and its character. Some analysts see it as the age of innovations in arts, music, literature, and poetry (producing Leonardo da Vinci, Michelangelo, Masaccio, Pisano, Dante, and their contemporaries in other European countries such as Shakespeare, Byrd, de Montaigne, Mouton, among others). Other analysts emphasize intellectual pursuits as the defining characters of the age, especially regarding contributions to human, social, political philosophies, which significantly affected the courses of revolutionary events in Germany and England. There are other analysts who emphasize the Renaissance's contributions to natural sciences which opened the way for scientific discoveries and the industrial revolution a couple of centuries later. All these contributions played major roles in articulating

the social system and are relevant in the context of the paper, as will be demonstrated below.

The Renaissance brought about basic innovations in societal philosophies and contributed to revolutionary changes with lasting effects on the evolution of the socio-economic and political system in Europe. The two outstanding revolutionary changes in this age were those of the protestant reformation and of the parliamentary democracy, which have been labelled by historians as the German revolution and the English revolution (in contrast to the Papal revolution which was based in Italy). Before entering into the events that led to the German and English revolutions, it fits to comment on the rise of societal philosophies in the Renaissance. Sometime in the thirteenth century, the influence of religious settings reached its climax and started diminishing quickly thereafter with the advance of the Renaissance. Humanistic thought developed against a Christian backdrop. Humanism came in and challenged orthodox religious belief and practices about restricted individual expression and suppression of the ego, self-abnegation and self-annihilation, and the unquestioning obedience to the church and authorities. Instead, the renaissance propagated the creation of a universal man whose person combined intellectual and physical excellence and who was capable of functioning honorably, and elevated education and knowledge as basic instruments in nurturing humanism. Many of the Renaissance's foremost theologians were humanists, including Desiderius Erasmus, Martin Luther, and John Calvin. Other humanists like Niccolò Machiavelli, and Thomas More emphasized the virtues of intellectual freedom and individual expression. As political philosophers, they respectively sought to describe political life as it really was in terms of intrigues and non-transparences, and applied ideas of Greek and Roman democratic thinkers in critiques of their contemporary government. All these political thoughts were influential in shaping the German and English Revolutions.

Martin Luther can be said to have started the *German revolution* in 1517 by challenging ecclesiastical authority in the most radical terms. He demanded abolition of the ecclesiastical jurisdiction and denounced papal indulgences. Furthermore, he denied the validity of the canon law. An endnote gives a brief account of what happened.[15]

Along similar lines, Reformist Puritans led the *English revolution*. In 1640, they formed a majority in the parliament that was seldom convened, and they opposed the absolute reign of the monarch. The Puritans associated with John Calvin, who also denied the authority of the Roman church, as Luther did. Calvin differed from

[15] From Berman (1983): 'No priest, Luther said, is authorized to come between God and the individual human soul that seeks forgiveness for sins. Therefore, no priest can promulgate the laws by which Christians should live. The Church, Luther said, has no authority to declare laws at all. It is not a law-making institution…… Soon after, the ruling Emperor excommunicated Luther by imperial decree. In 1529, ruling princes and city representatives, in support of Luther, protested the imperial decree, and civil war broke out. It is from this protest that the name Protestant is derived. The princes formed a religious party, the Protestant League, which in 1552, with the help of France, defeated the emperor. Finally, in 1555, at Augsburg, a religious peace was made, whereby each of the various principalities of the Empire was empowered to establish its own form of religion, either Catholic or Protestant… In the years that followed the Papal position on supremacy of the Church was replaced by the strict separation of church from state in matters of jurisdiction and authority.'

Luther in proponing that mankind acts always as God's agent in the unfolding of God's purposes behind the creation, that the unfolding and reformation ought to be globally applicable to all places and peoples, and that the means of reformation ought to be through laws and legislation. Puritans propagated that the right path requires practicing communitarianism (each person is responsible for all, and all were responsible for each), embodying toughness (hard work, thrift, austerity, reliability, discipline, commitment), and that government be run by representative leaders of the community (elders and, magistrates and not a single ruler or multiple princes). The endnote here gives a brief account of what happened.[16]

In short, the German and English revolutions, taken together, established institutions that shifted political power to representatives of the population, emphasized common law, abolished prerogative courts eliminated feudal tenures, prohibited arbitrary taxation, recognized property rights, and esteemed the individual's responsibility and accountability for one's own actions-in short, the protestant ethic. Although these various elements belonged to the separate subsystems of political, legal, social and economic realms, they nevertheless fed each other, sought operative balances, and formed together a consistent whole that circumscribed the political, social and economic subsystems.

The impact of the German and English revolutions on the social system of the western world is enormous and fundamental. Max Weber was the first to propose that the acquired values of the protestant ethic were behind the takeoff of the European economy. Weber's thoughts, when paraphrased in terms of our conceptual framework, boils to formulating and accepting two statements: (a) that western society has acquired the values of the reformist revolutions that associate with and foster productive work and maximum returns, as are typical of the firm centered behavioral type; and (b) somehow the firm-based profit maximizing behavior has invisible fingers that were able to mold the other political, social and economic elements, or subsystems, into a consistent whole that reflects their newly acquired values.

World discoveries and the colonial conquest. The Renaissance was not only famous for its contributions to art, intellect, humanities, and polity matters, but it was also the revelation for geographical discoveries and the broadening of the worldview during the fourteenth–seventeenth century, as well as technological advances and the industrial revolution in the eighteenth–nineteenth century. This section considers the systemic impacts of the geographic discoveries, a later section deals with the industrial revolution. Although the roots of the discovery age go back

[16] From Berman (1983): 'A civil war broke out in 1640 between the Puritans (mostly reformist trading and craft guilds in towns and countryside) and supporters of the monarchy (conservative churchmen and landlords). The Puritans seized power, formed a commonwealth government, trialed and executed King Charles I for treason and abuse of power in 1649. … Ten years later, the Puritan rule collapsed in 1658. The king's son, Charles II, was restored as monarch. When the next monarch, James II, resumed abuse of power, he was forced to abdicate, and a new dynasty was installed in 1688. Henceforth, the governing authority was the parliament and not the king. The system of parliamentary political parties started taking shape and evolving to what it is today. The Bill of Rights was enacted in 1689. Judges were given life tenure. With the abolition of the prerogative courts, the common law courts were recognized as subordinate only to Parliament. The content of the common law also changed, both in procedure and in substance.'

to the Vikings, the crusaders, and the eye-openers of the Renaissance, the immediate need for explorations came from the war successes of the Ottoman Empire in the Middle East and their ability to obstruct overland trade routes from Europe to the spice-growing Asian countries. In reaction to these barriers, governments and traders in Portugal and Spain started exploring new ocean routes to Asia. Political power and economic trade were major motivations. While succeeding in opening a southern trade route to Asia by sailing around Africa into the Indian Ocean, Spain and Portugal stumbled across the Americas. Soon after, the Dutch, British, and French followed, while Italian seaports and citizens played central roles in explorations and trade.

The discovery age and the colonial conquest, by themselves perhaps the greatest events in world development, have triggered fundamental changes in global relations and social systems. The collaborations between the governing authorities and overseas traders are especially relevant for our analysis. European monarchies sought greater powers in their countries via expanding colonial territorial possessions, which pushed more European monarchs to compete for the same political goal. Ultimately, the political objective served as the means to realize the desired and more commonly felt economic objective of bringing more material benefits from the colonial act. The politico-economic collaboration meant that the monarch and the allied governing authorities would mobilize recruited militaries and rely on established sea traders, shippers and craftsmen in realizing the colonization ventures and their material benefits. To that end, and after the discovery of the Americas, colonial governments and traders in Europe collaborated in the colonial acquisition of the territories, in mobilizing and transporting migrants from Europe to the Americas, and in the production of agricultural commodities for exports to Europe against traded imports of goods from Europe. With limited native populations in the colonies, the colonial governments and traders looked for other workforce sources: slaves. They began by battling and capturing African slaves and went later for buying African slaves from Afro-Arab capturers and sellers, transported and made them work on cotton and tobacco plantations in the southern colonies of North America, and in mines and sugar-producing areas of Central and South America.

Triangular trade is the term used for describing this lucrative exchange between Europe, Africa and the Americas. Triangular trade involved three stages: Carry first such goods as cloth, spirit, tobacco, beads, metal goods, and guns from Europe to Africa. The goods were sold to Afro-Arab slave traders in exchange for more slaves. The guns were used to help expand empires and subjugate slaves. The second stage was an inhumane shipping of the slaves to the Americas. The third stage was the return to Europe with the produce from the slave-labor plantations: cotton, sugar, tobacco, molasses, and rum.

To increase their income from taxing the triangular trade, European monarchs encouraged the formation of joint stock companies. Stocks (or shares) were sold to investors who shared the expense and risk of expensive ocean trading voyages. If a ship went down, no single investor lost everything, but if a voyage was successful, all stockholders shared in the profits. Most voyages succeeded, and many investors made good money. The British East India Company and the Dutch Verenigde Oost-Indische Compagnie, (VOC) established in 1600 and 1602, trading mostly

with the Indian and Indonesian colonies, were the most successful ventures. Joint stock companies promoted the rise of the modern firm. Since governing monarchs chartered the joint stock companies of the colonial era, they were a form of state-sponsored firm ownership. This is a bright example of how the state subsystem was involved in strongly supporting (or ex-post, how the state was made to support) the firm subsystem.

Among the greatest impacts of the colonial conquest is the more than triplication, amply four centuries later, of the market size of Europe, by the addition of the market sizes of North America and other conquered European Commonwealth countries. The expanded markets meant that hence forth an abundance of opportunities for making profits were projected ahead. This stipulated triple expansion of the marketplace for trading and shipping firms was an unprecedented boost for the firm subsystem. Although the period of discovery and colonial conquest raised the authority and strength of the state subsystem to a highest level, this period prepared the ground for greater gains for the firm subsystem in later periods.

The rise of nation states and business metropolis were two other major world developments in the Middle Ages. Generally speaking, the state is a coordinated polity system with geopolitical boundaries, while the nation implies a unified population along cultural, religious, linguistic and other related dimensions, territorially bounded. The term nation state implies that the two combine in one, and thus reinforce each other. There are thus varying degrees of the integrated nation state. In general, the longer that there is shared polity and history for a country the greater is the applicability of the notion nation state to the country. The rise of nation states in 1400–1700 significantly boosted the authority and strength of the state subsystem in Europe. While the fifteenth century in Europe started with powerful monarchs reigning on approximately defined territories (advances in map-making technologies in the fifteenth century must have contributed to the drawing up of territorial borders and formation of nation states), polity matters were not strongly connected in a coordinated whole (that is to say: royal law, canon law, manorial law, communal law, commercial law, etc., did not form a common law system). During the sixteenth and seventeenth centuries and due to the reformist revolutions in Germany and England, the systematization of polity coordination advanced significantly. The evolution of the bond between a people and the territory these people inhabit was also advanced appreciably. The German revolution, being the result of confrontations between the established German governance and German protesting leaders on behalf of millions of Germans in German territories was a milestone in the development of the nation state of Germany. Similarly, the initiation of the English revolution, its accomplishments, and applications by the English people as citizens of the British Islands was another milestone in the development of nation states. Historians also note the early emergence of a relatively unified nation states, and a sense of common identity, in Portugal and in Spain as early as the fifteenth and sixteenth century, and in the Dutch Republic, which existed from 1581, when seven provinces of the Netherlands separated from Spanish rule and formed a union. The relative isolation of the Scandinavian countries in terms of distance contributed also to the early emergence of nation states in Scandinavia. Synchronization of the polity system in France had to wait longer: until the French revolution in 1789, and some years after. However, the

spread of the French language as the mother language in France in the Renaissance contributed significantly to the gradual formation of the French nation. The nation state of Italy lagged.[17]

Other factors played important roles in the development of the nation state in different countries. The nation state gathered strength in the age of world discoveries and colonial conquests. It is not surprising that the earliest nation states of Portugal and Spain were the leaders of national interests and colonial conquest, followed by the Netherlands and England. Nationalistic attitudes favoring state hegemony also received a boost from the mercantilist thought which esteemed national protection in the conduction of foreign trade.

An equally important threshold was the rise of *business metropolis,*[18] which was basic for the evolution of the firm subsystem. A crucial development in the economic history of Europe was the major shift of economic power from the Mediterranean Sea to the North Sea, which went along with the creation of multi-purpose business metropolis in the latter. The commercial cities of Genoa and Venice, which were forerunners of urbanization in Europe in the fourteenth and fifteenth century, were replaced in the sixteenth and seventeenth century by city ports that can be likened with business metropolis like Antwerp, Bruges and Amsterdam in the Netherlands and Bristol, Liverpool and London in England.

The shift of economic power and business centers from the southern to the northern countries has always been fascinating to study. It is sufficient to mention here what are thought to be the main factors behind the shift. On the negative side, the fragmented governance of Italy delayed the phase of consolidation into a nation state, and thus forgoing its economic benefits; France was agricultural and still under influence of a significant feudal subsystem, while Spain and Portugal were preoccupied with defending their colonial conquest overseas. On the positive side, the Netherlands had the advantages of a puritan attitude toward work, obligation and property rights, an early adoption of the nation state, a densely populated small sized flat land, a favorable positioning as the mainland port to the north central part of the continent, accomplishments in innovative uses of water and wind for generating energy, and ability to increase productivity in shipping overseas and inland. By building the business metropolis the merchant class minimized the cost of exchanges (namely search, negotiation, enforcement and financing costs). Search costs were reduced through first establishing regional market fairs that grew later to large scale permanent markets in Amsterdam. Commodity prices determined by supply and demand forces were gathered periodically and made public. The large

[17] It is paradoxical to note that while the first people and the first country to dominate Europe were the Romans who inhabited the Italian Peninsula, it was Italians and Italy who were among the last to form their nation state of Italy, in 1871; which was to a great extent the result of the political and military engagement of Giuseppe Garibaldi (1807–1882), jointly with a few other leaders.

[18] A business metropolis is a large city or urban area which is a significant economic, political, and cultural center for a country or region, and an important hub for regional or international connections, commerce, and communications. Although today the term of metropolis is used for cities of millions, our use of the term to signal the urban agglomerations of city ports in the Middle Ages is justifiable time-wise and population-wise in relative terms.

volume of sales that took place resulted into conventional practices and norms that increased trust and reduced negotiation costs.[19] Enforcement costs of contracts were facilitated by public notaries; these were attached to the markets and sanctioned by government. Another major breakthrough was the development of a financial market that was driven for a part by fiscal borrowing needs of foreign governments, France and Spain among others. The liquid business leaders were ready to lend. Short-term and long-term depositing and lending to many sorts of customers grew significantly, facilitated by the establishment of banks and the legal right of transferring and endorsing obligatory letters of payment to third parties. The reach of the business metropolis went beyond trading and financing to art and culture. Urban merchants operated as in a modern outsourcing profit maximizing firms: the merchants contracted countryside workers, supplied the raw materials, fixed specified demands, and paid on fixed delivery, for activities ranging from fish catches and dairy products to tool forgery and cloth making. [20] Also on the positive side was England, being the earliest to share the puritan attitudes, to go for the nation state, to undergo a political revolution, and to institute a House of Commons with a majority from the rising merchant class and landed gentry. England copied the successful business examples of the Dutch, became rivals on disputed colonies, and even went into war. The bigger size of England was decisive in making the colonial market fall in English hands and turning England in the new number one business leader. While British farmers introduced newly domesticated crops, British entrepreneurs became major producers of cotton and woolen textiles, production primarily located in the countryside to escape guild regulations. The scale of production in heavy industry grew. Over the seventeenth century, England enacted a Statute of Monopolies, which ended the Crown's prerogative in creating monopolies, and created the first patent law to encourage innovation. Networks of trade, industry and science were established, and financial markets were in operation in the capital and major cities.

Readdressing our question on how the S and F subsystems faired by the end of the seventeenth century, one obvious answer is that while both subsystems were building up their constituent forces for the next round, in some countries the S subsystem was ahead of the F subsystem. This applied to countries that have gone through the reformist revolutions and had already more or less adopted that polity system which centuries later converged toward the stable shape that is observable today. Considering the side effects of the evolvement of the nation state, colonial conquest and mercantilist thought, it is logical to reason that in these instances the S subsystem was likely to have been more dominant than the F subsystem, especially with regard to controlling influence, less so regarding interactive influence. However, there is no data on either regulatory influence or interactive influence to test the reasoning. As for the F subsystem, in countries like England, Netherlands and a few others,

[19] The advancement that took place in the Netherlands and England are discussed in North (1973) pp.136–7. See also North, Wallis and Weingast (2006).

[20] Although the urban cloth making craft guilds experienced a loss of monopoly, their interest was overpowered by merchant firms and government authorities, who took over and strengthened the city with a prosperous business community and a lively cultural center.

the prerequisite conditions for launching the F subsystem into its industrial orbit were present by the end of the seventeenth century, waiting for the takeoff during the Industrial Revolution that was due five decades later, when positions would start reversing and eventually place the firm subsystem above the state subsystem.

3.4 The Period of 1700 to 1900

Enlightenment and the constitutional revolutions. The *Enlightenment* era (1700–1850) is held to be the source of democracy, rights, liberty and reason as primary values of society. Contributors to the Enlightenment era included political and legal philosophers, economic and social thinkers, and natural and physical scientists. In this section we comment briefly on the political enlightenment, where we emphasize the political dimension of western philosophy and rational thought, and which fed essential elements to the American and French constitutional revolutions, culminating in the contemporary contours of the state subsystem. In the next section we focus on economic and scientific enlightenment that is closely aligned with the industrial revolution and the firm subsystem.

The Political Enlightenment supplied major elements of the political program, adopted by leaders of the American and French revolutions years later. Montesquieu's *Spirit of the Laws* had expounded the theory of separation of powers; by placing the functions of legislation, executing, and judging in three wholly separate compartments, with legislation supreme over the other two. Montesquieu also taught that constitutional law should promote individual liberty and economic equality. Rousseau taught that law should rectify inequalities that arise from natural differences among people. In his *Discourse on Inequality,* he proposed that inheritances ought to be reduced by taxes, and that those who owned no land receive some. Voltaire proposed substantial reforms of communal law. And for the first time, in the 1780's, 'public opinion' entered the arena as a separate dimension in deciding the course of events. The Political Enlightenment era contributed groundwork principles for the American Declaration of Independence, the US Bill of Rights and the American Constitution, and the French Declaration of the Rights of Man and of the Citizen. These principles that have remained intact since then until the present day, demarcate the authority and obligations of the state subsystem in western countries.

The historical facts are well-known. The *American Revolution* (1775–1783) started with Thomas Jefferson's Declaration of Independence (which contained ideas from the Political Enlightenment), followed by establishing the independence of 13 North American colonies from Great Britain, creating the republic of USA, and enactment of the US Constitution and the US Bill of Rights, which contained articles that embodied the doctrine of the separation of powers, whereby the central polity is divided into the three branches of legislature (bicameral Congress), the executive,(Presidential administration), and the judiciary (Supreme Court and other federal courts); the doctrine of federalism (describing the relationship between federal states and between federal states and the central polity. The constitution also included articles on its amendments, and various checks and balances on the powered authorities, meant to assure restraint and accountability of the governing

authorities to the electorate. The US Constitution was interpreted, supplemented, and implemented by a large body of constitutional law. Adopted in 1787, and amended on several occasions, in terms of world development, it was the first constitution of its kind, and had an inspiring impact on the constitutions of other nations.

At around the same time, 1789, the events of the *French Revolution* rolled. [21] In the decade after 1789 France was in a constant state of turmoil, as various revolutionary factions fought among themselves, and launched wars with neighboring countries. In 1799, France was ready for Napoleon Bonaparte's dictatorship. Some ten different constitutions replaced each other between 1789 and 1815. The French revolution culminated with the establishment of a republican polity system, with supreme power given to a legislative assembly elected by popular vote and responsive to public opinion. The church was subjected to state control insofar as that was necessary to protect religious toleration. The judiciary was confined to the application of statutory law. Social privileges of the aristocracy and feudal law were abolished, and equal civil rights were established for all. The legal system was transformed by unifying French law for all French regions, and by codifying criminal, civil, and commercial law on a national scale. In civil law, the enacted Code Civil (drafted by Napoleon in 1804) expressed the spirit of the revolution, by bestowing strong protection to contracts and private property rights.

Economic thought and the industrial revolution (IR). Technically speaking, the IR began in Great Britain around 1760 and within a few decades spread to Western Europe and the United States. A first phase ending in 1840 converted hand production methods into mechanical ones, introduced new chemical manufacturing and iron production processes, and developed machine tools. As regards energy, wood was replaced by coal, steam power introduced, and water power improved. A second phase, between 1840 and 1870, saw increasing adoption of steam-powered boats, ships, railways and factories, and the large-scale production and use of machine tools.

At the advent of the IR, many institutional ingredients for the pursuit of profit maximization in firm settings were already present in Europe (i.e., property rights, commercial law, distribution networks, and markets for products, labor and finance). Merchants, craftsmen, trading enterprises and cottage industry were abundant and active, though more so among the northern European (England and Netherlands) than among the southern European countries. Even though the prerequisites were present, the IR once started, it overturned the whole socio-economic system upside

[21] Here are the historical events. The monarch in France in 1787 had absolute authority, limited symbolically by appellate courts and the historical institution of the Estates General, the national assembly of representatives of the three estates (clergy, nobility, the Third Estate consisting of officials, lawyers, teachers, merchants, artisans, and others). Little revenues and luxury spending drove the crown to the verge of bankruptcy. An aristocracy that held to its privileges was confronted with hunger riots and peasant revolts. The Estates General, meeting at Versailles in May 1789-for the first time in 175 years, with sharp conflicts between representatives of the clergy and nobility coalition and the Third Estate, ended with the Third Estate assuming full sovereign powers of the National Assembly. The storming of the Bastille was on the famous July 14, revolution started, and monarchy fell. Subsequently, the old administrative and judicial authorities were dissolved, and the legal system was reformed.

down. The IR fueled the creation of profit maximizing firms as we know them today. The firm is hence a factory or a workshop that the risk- bearing owner/manager/entrepreneur sets up, and it is populated by hired regular employees who engage in the mechanical transformation of inputs into outputs (intermediate and final products). The outputs, scheduled for sale at stipulated prices by the owner, can end up in other prices, once subjected to market forces of demand by all consumers and market forces of supply by all producers. Such modes of production, distribution, pricing and clearance were realized through the IR. Economics, as a science, played a significant role in clarifying and supporting the rationale of the IR. Classical economists in 1776, i.e., Adam Smith, succeeded in specifying and knitting these different modes into a consistent static economic system in which consumers and producers pursuing utility maximization and profit maximization, respectively, and left to their own, would equalize their respective demand and supply at variable prices in perfectly operating markets. The dynamics of the economic system emphasized that because the profit of the owner is the residual of the market price less incurred labor, machine and material costs, the owner must be extra alert in his deals on costs and prices. Profitable and growing firms will generate incomes for employees that are then spent for new demands for goods that open opportunities for more entrepreneurs and new and more firms, and so on. The numbers of goods, firms and firm employees skyrocketed for decades, and earnings kept on increasing since then. Although the degree of growth in these numbers fluctuated in the course of three centuries, a trend was started that would continue until present day, and that would make profit maximizing firm settings as the most extensively spread and most intensively populated subsystem in western countries. Classical economists highlighted the circular flow and the growth dynamics of a profit-maximizing firm-driven economic system. Because profit rates tend to diminish as more competing firms enter into production, competing firms seek to innovate and widen the scope of production toward more goods with higher profit margins.

How did the household and state subsystems respond to the IR? Important for our study is the change in the behavior of agents from a kinship sharing motivation typical of traditional household settings to a profit maximizing motivation typical of firm settings. Husbands and wives left their common dwellings on a massive scale and worked as employee full day in different firms. Child labor in yet another firm was normal.[22] The break-up of the traditional family was definite and real. Scholars have called the phenomena estrangement. This is of course different from alienation that stands for the separation of the product from its maker, which is also a revolutionary change brought about by the commercialization of the firm. The notions of a traditional household setting and of communal sharing were abruptly replaced

[22] Children as young as four were put to employment. Youth performing the same work as elders earned 10% to 20% of an adult male's wage. Government tried to limit child labor by law, but factory owners resisted; In 1833 the first general laws against child labor, the Factory Acts, were passed in Britain: Children younger than nine were not allowed to work, children were not permitted to work at night, and the work day of youth under the age of 18 was limited to twelve hours. Factory inspectors supervised the execution of the law, however, their scarcity made enforcement difficult. About ten years later, the employment of children and women in mining was forbidden. Gradually this was extended to all sectors.

by loyalty to the employing firm. In time, the opportunity for employees to organize and negotiate their demands with the employing firm would grow and be realized. Such a realization underlined the recognition of the mutual interests between employee and employing firm and the common interest of both in advancing the sustained growth of the firm. It would be some time before the working class developed a counter-ideology of their own, and. became a social and political force of their own; though at a personal level, the employee always felt as part and parcel of the employing firm, and indirectly proponed and participated in the realization of the profit maximizing goal of the employing firm.

Economic thought played a significant role in justifying this new scheme of work and living and made it the sensible path to follow for the employee and the firm owner alike. For example, economists treated the utility maximizing objective of consuming agents (measured in material terms) at par with the profit maximizing objective of firm owners and made the realization of the two objectives interdependent on each other. At the end of the day, the two objectives boiled to the same thing of retaining the highest benefit from a particular economic activity. Furthermore, the rationale for the profit maximizing motive gained ground as a result of economists laying down the interdependence at the firm level of rates of productivity, wage and profit. For the wage earner to earn more, it is in his interest that the firm increases productivity and pursues the profit maximizing objective.

How did the state subsystem, *S*, give way to the *F* subsystem during the IR? The greatest part of the newly created and produced goods during the IR was private goods, produced by profit maximizing private firms. Major public works were contracted to private firms as well. The shares of private firms in terms of employed agents and economic transformations overpowered the corresponding shares of the public sector. Making use of the conceptual framework set out earlier in the paper, it can be stated that the IR laid the basis for an edging *interactive influence* of the F subsystem over that of the *S* subsystem. What about the *regulative influence* of *S* on *F*? As the rest of this paragraph shows, economic thought on the IR dealt a crushing blow to the regulatory aspirations of the state. We may recall the support given by mercantilist thought to the regulatory powers of the nation state, in the sixteenth–seventeenth century. That was a time when the controlling influence of the state reached a top. Not much later, mercantilist thought and the regulatory were shown to be economically inferior to free trade and competitive markets by the classical economists. Adam Smith, among others, built the rationale for the state to take a back seat and abstain from interventions in the free markets. The message was: markets are able to regulate themselves and end up with satisfactory outcomes for their participants, when free of state intervention. Although the classical economists were aware of market failures which required state interventions, economic thought refining on issues of market failures is a later elaboration in time.

How did the F subsystem itself develop and expand further? There were subtle differences between the firm before the IR and after the IR. To mention a few: firms before the IR were mainly merchant firms, urban craftsmen, cottage workshops and the like, with some current capital but little fixed capital (the firm had minor tools and equipment). Firms of the IR were manufacturing factories requiring more current capital to finance pre-paid wages, and substantially much more fixed-sunk

capital (premises, machines). The presence of financial firms (and financial markets) and the ability of entrepreneurs to obtain financial credit were crucial for launching the new firms. Because technically speaking the magnitudes of fixed-sunk capital would keep on increasing at accelerated rates throughout future years, the financial component of the *F* subsystem had to increase at accelerating rates as well. In passing, it is important to add that if left uncontrolled, this accelerated tendency of the financial sector can result in explosive risks. The conclusion to draw at this point is that economic thought laid down the foundations for promoting the processes of the IR and the dominance of the firm subsystem on other subsystems. Other subsystems have fused, lost intensity or disappeared. By the end of the eighteenth century feudal manors and urban communes were fused in the state subsystem, trade and craft guilds became part of the firm subsystem; and theocratic settings seized to have significance in the economic system.

It is relevant here to emphasize one major difference between the classical economists (1700–1850) and neoclassical economists (1850 and later), which is crucial in the development of the western economic system and for its study. While the attention of the classical economists went to markets, the neoclassical economists brought the firm explicitly in the picture. Focus on firm settings and the firm subsystem is more instrumental for formulating and applying a conceptual framework for systemic analysis than referring to the notion of markets, which is a popular term but empirically is vaguely observable. The focus on firms as entities that can be observed and followed is a basic requirement for the better understanding of the functioning, growth and evolution of the economic system, and its relation to the whole social system. Besides, focusing on firms has enriched our knowledge of the economic process and led to creating tens of firm related disciplines in economics and business.

3.5 The Period of the 20th Century and Recent Years

The state subsystem in the western world, after going through the German, English, American and French constitutional revolutions, can be said to have reached its polity trajectory and satiation point already by 1820 or some two decades later. In relative terms, there has been little evolution in the polity structure of the S subsystem since then. Of course, state regulatory institutions evolved and changed, and so did state obligations and policies in the last two centuries; but the polity structure remained intact and appears to have reached a stabilized balance. The evolution is otherwise with the firm subsystem, which was totally revolutionized during the Industrial Revolution (1750–1900) and has been undergoing important changes since then and up to the present day. The firm subsystem has not yet reached a long-term stabilized balance, as in the case of the state subsystem.

In the twentieth century and later years, the following major events with significant systemic impacts can be singled out: two world wars (WWI and WWII), two great financial collapses (great depression 1929–33 and great recession 2007–09), and several breakthroughs in political and economic western integration (NATO, EU, multinationals, and globalization).

Regarding the world wars, the causes of *World War I (1914–18)* were rooted deeply in the strengthening of Europe's nation states, or rather nationalist states, and the forged alliances between camps of nation states. An assassination set off a diplomatic crisis followed by a war declaration by Austria-Hungary on Serbia. Like a series of dominos, the other countries in Europe were pulled into a full war given their alliances to the two disputants, ending in Germany confronting and losing from France, UK and USA on the west front, and Russia on the east front. WWI had important long-term consequences. The enormous cost of the war undermined the financial stability of all European countries involved and their state subsystems had to bear a burden of debt for many years to come. These financial losses, combined with the battlefield deaths and physical destruction, severely weakened the western front European powers, and pushed the USA to become a world political power and the world's largest economy. On the east front and one year after the war, the Russian Revolution replaced the czarist regime by communist rule. As for *World War II (1939–1945)*, many historians see its causes in the enormous war indemnities and harsh terms of surrender that Germany had to accept after WWI. In some sense, WWII was a revenge war against the outcome of WWI. The contra parties were the same as in WWI, except that this time Germany's allies included Italy and Japan. The outcome in terms of gainers and losers was also the same as in WWI. The terms of peace were totally different, however. Instead of losers paying war indemnities, the losers and gainers in Europe (and Japan) entered in a period of post-war construction led by a close collaboration between states and firms; while the Soviet Union (with allied and/or subjugated east European countries) continued along its communist track.

Turning to the economic upheavals, the *Great depression* (1929–1942), began in the USA and spread to most FIS countries. The "Roaring" twenties in USA was a prosperous time that allowed excessive enrichment of some, inflated expectations of many, and fueled demand for financial credit, leading to a bull market and ending in a bursting speculative bubble in October 1929. The financial meltdown was followed by the longest recession in modern times. By early1932 banks failed massively, wiping out the savings of millions of Americans. Unemployment reached 25% at a time when unemployment benefits did not exist. Mortgages on many homes and farms were foreclosed. Furthermore, a severe drought spread across the Great Plains in 1930 and lasted for a decade. Recovery started with the election of President Roosevelt (his New Deal introduced programs to reduce unemployment, assist firms, regulate banking and the Stock Market, and help the needy). With the outbreak of World War II in 1939, the USA began spending on armament and other war expenses materials, which further strengthened a period of industrial growth. The event of the Great Depression allowed the Federal Government to expand its domain to meet collective needs in social welfare and regulate the financial market. In the early thirties, regulations were introduced to restrict stock purchase on margin and coordinate risk taking in banking; in the hopes that another severe crash could never happen again.

But history replayed itself some 75 years later, though less severely. The *financial crises 2007–9,* which started in USA in 2007, took the proportions of a financial meltdown in late 2008, and spread globally to other linked financial markets

economies, bringing them into economic recession in 2008 and 2009. The main cause is an overexpansion of lending activities that started from 2001 much beyond the ability of borrowers to meet obligations to pay back (the unregulated shadow market in USA reached a worth of US$ 50 to 60 trillion). The overexpansion was facilitated by the use of highly risky, undisclosed and complex newly introduced financial products and credit default swap insurance contracts that defy monitoring and regulation. The relaxed attitude toward regulation by the state central bankers allowed dubious transactions to expand unchecked. Credit default by homeowners in subprime mortgages in USA in mid-2007 triggered much bigger defaults among the mortgage lenders who were borrowers from other higher-up lenders, and so forth upward. Speculative short selling on the expectation that security prices would fall further caused more falls. It is in the nature of a credit crunch confronting bankers to spread to producers causing a decline in production, layouts, spending and eventually recession. In attempts to restore financial confidence and recover the economies from recession, state interventions in FIS countries ranged from temporary nationalization of financial institutions to capital injections, and bailouts of troubled investment banks; next to massive stimulus spending in the economy to combat the recession.

How did the S and F subsystems fare with the impact of the two world wars, and the two financial collapses? The wars and postwar reconstructions significantly extended the scope of activities of the state subsystem, which were directly translated in a greater regulative influence of S; only to be deregulated later on in 1980's. As for the F subsystem, although its production capacity was significantly damaged during the wars, F gained foothold in the defense and technology industries which later opened the way for thousands of new products that F was destined to transform and supply. Besides, it was firms after all which were engaged in executing the postwar reconstruction. All in all, it is safe to say that for an additional gain in the regulative influence of S, say x, there was a gain of $(1+y)\,x$ in the interactive influence of F. In contrast, the financial crises brought to the foreground the vulnerability of FIS countries, as an economic system that is prone to financial instability once leading financiers of the firm subsystem decide that the future expectations for profit maximization are overrated. Recovery from the economic recession that accompanies the financial crises is a collective need that can be resolved by the state only. The solutions posed and implemented gave the state a greater regulative influence on the banking sector and financial products, which can be viewed as a win for S and a loss for F in the regulative sphere.

The evolutionary analysis can be refined to consider more recent developments. Globalization and increased multi-country production and international trade gave strengthened the dominance of the business firm subsystem. Simultaneously, the F-subsystem itself is being reshaped within. Globalization reoriented the F subsystem toward two branches with an uneasy relationship between them: these are the F-financials and the F-tangibles. The two branches of the firm subsystem rely on each other to carry their business, but in general, the management of money carries more leverage than the transformation of tangibles. Mismanagement by the financials, even if it is small, can bring significant damage to the growth prospective of the tangibles. In times of financial crunch

(2007–9 and continued for more years, mostly at the discretion of financials), tangibles suffer most. There is a rationale for the F-tangibles to support a strict state regulatory regime of the F-financials, if the financials are not able to fix transparent rules of conduct for themselves that are also acceptable for those dealing with them. Tangibles have a long history of fighting monopolistic practices in their segment and they work closely with government and the judiciary to realize competitive markets. This is not yet the case with financials. But their control of finances allows the F-financials to overshadow the F-tangibles and have an edge in dominance.

Along similar lines, and more significantly, the last decade experienced the beginnings of the Fourth Industrial Revolution (4ID), with rapid rises in the digitalization of society, and innovations in artificial intelligence, robotics, biotechnology, fintech etc. The rising influence of informational settings paves the way for a prospective dominance of a third fraction in the business sub system, what can be called the F-informational. Contrary to the F-tangibles and F-financials, the transaction medium in the F-informationals is neither goods nor money, but are information bits that agent x communicates explicitly or implicitly, and which are mined and used by agent y to influence and redirect the behavior and decisions of agent x so as to benefit agent y. Although informational settings are not restricted to the Firm subsystem, their occurrence is highest in the Firm subsystem which is financially and technically equipped to host them.

The 4IR is a reality that is changing community life and world development significantly, see Alam et al (2020); though it is not yet definitely clear to what extent since there are complex interactions which involve the nation/state subsystems of major countries in the world. Hi-tech, AI, biotech and digitalization involve national security risks which lie in the domain of the state subsystem. It is logical that the state subsystem in one nation is called upon to be active in seeking control of the impacts of 4IR in own nation viz a viz other nations. If the different nation/states succeed in controlling 4IR within each's borders, this can block the speedy rise of 4IR, retard globalization, and reduce expectations. There are already indications of reduced globalization due to national security regulations and trade wars between UAS and China, though the reduced globalization is also due to the Covid epidemic, and shortfall in supply chains. The 4IR is not yet part of the past; it is current and the future is loaded with uncertainties. This is also the reason why the paper, which focuses on the past, cannot treat the emerging 4IR in any depth.

3.6 Overview

After presenting a conceptual framework for the analysis of the development of the economic system as a systemic whole, the paper made partial use of this conceptual framework in reviewing the rise and growth of competing subsystems in the western world in the last ten centuries, in particular the state and firm subsystems. While Fig. 2 gave the timeline of historical epochs in which major shifts of influence occurred among these subsystems and others, Fig. 3 sums up plausible magnitudes

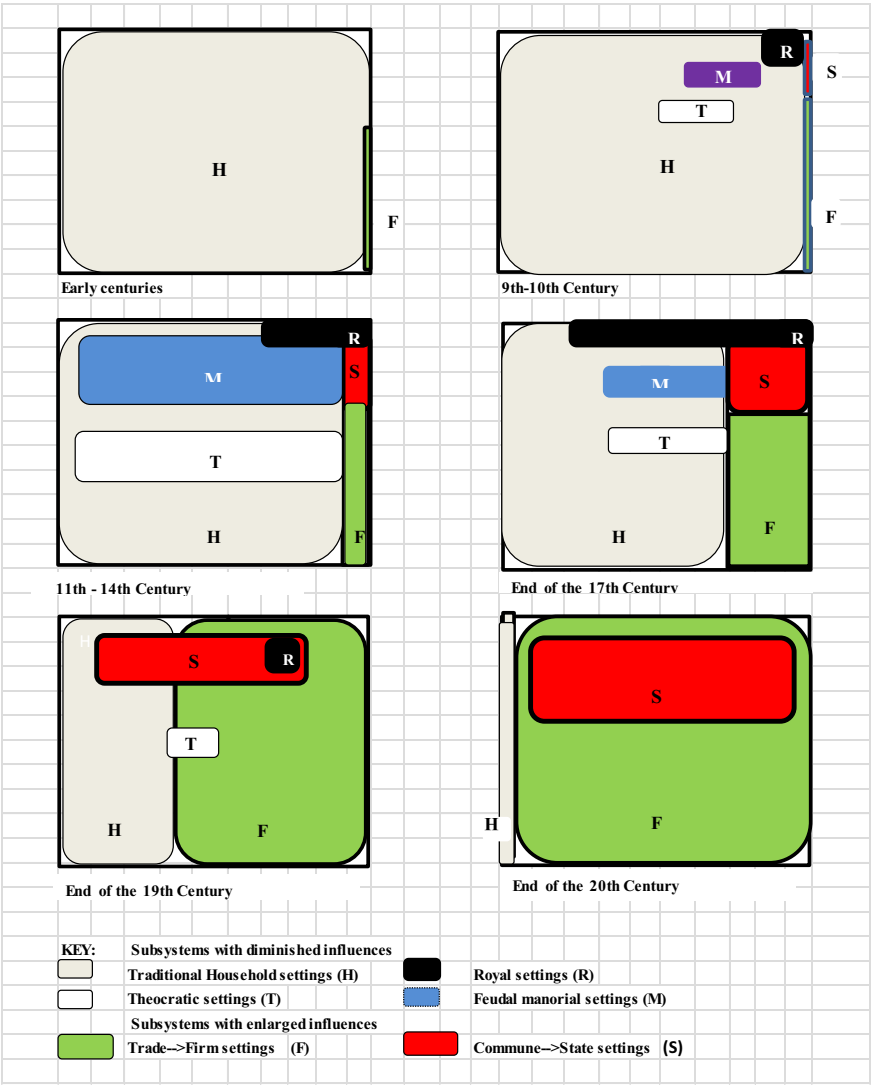

Fig. 3 A stylization of relative magnitudes of major subsystems in FIS countries: Early centuries to 21st Century

that reflect past changes in the relative dominance of these subsystems. This figure approximates the western world by a square plane and the size of agent participation in subsystems by enclosed brackets. The figure gives configurations showing which subsystem was dominant in which epoch. For instance, in the early centuries, rural households occupied about 95% of the whole square plane. The birth of competing subsystems occurred in the eleventh–twelfth century. After reaching their peaks, from then onward, agent activity in theocratic, feudal, royal and the traditional household subsystems declined, while firm and state subsystems increased.

By the end of the twentieth century the once dominant subsystems of traditional households, manorial, theocratic and royal settings have declined tremendously over time and can be guessed to command no more than 5% of the population, the state subsystem about 25%, and the firm subsystem about 70%. With a dominance of 70% in FIS centered countries, the *F* subsystem is able to spread its interactive influence and controlling influence on the whole system. The magnitude of the dominance would imply the conversion of the intrinsic motives of such subsystems as traditional households, manors, theocracy, royalty, and the state as well, into the intrinsic motive of the firm subsystem, i.e., profit maximization, is completed or near completion in the western world.

4 Concluding Remarks on Future Developments

The paper raises two important questions. First, would the history of systemic development in the western settings (evolution toward a firm intensive system) apply to the future of economic systems in other parts of the world (i.e., China, India, Russia, Islamic countries; call these eastern settings)? Second, are there clues about the future directions of the predominantly firm oriented western economic system? Backed by the postulates of social system modeling the answer to the first question is 'probably no' and the answer to the second question is 'It depends on convergence tendencies.' In a globalized world with intensive interactions between the distinct and different western and eastern settings, it is likely that convergencies would occur in both directions.

First, the history of the western world, as the history of any other world region, is unique in that the starting points are different and the occurring events they face are of different substances and dimensions. The idea that the profit motive and the firm subsystem are capable of becoming the most dominant subsystem anywhere and have invisible fingers that automatically mold the social, political, legal, education subsystems into a consistent whole everywhere is dogmatic and not proven. There is no magical, hidden or rational nucleus that molds the whole system to one 'final destination.' If after hundreds of years of historical events and subsystem interactions we 'observe' today a firm-dominated system in Europe and USA, then this 'observation' is the result of a specific history that allowed firms settings to prosper and dominate. By the same token, countries like China, India, Russia and Islamic countries have their own starting points and histories which have shaped their current social systems. Regulatory influences of the cultural and state subsystem over many past years are dominant in spite of the recent and quick advances of their firm subsystems. Given the magnitudes of the competing subsystems in the eastern context, it is not likely that the eastern countries would follow the western course of system development.

There is the hypothesis that significant interactive and regularity influence of the powerful firms-led western world can impact other world regions in the same direction. However, this influence is likely to be limited. Global studies of the dominance index (DI) at the world level, see Cohen (2015), show that the DI in 2012 of US, EU and related western economies is stuck at 39.4 percentage points, and is predicted

for 2030 to be at 30.6 percentage points (pp). DI for the world regions around China and India, that is, East Asia Pacific (EAP), and South Asia (SA), respectively, amounted in 2012 to 21.5 pp and 13.3 pp, and are predicted in 2030 to score 25.0 pp and 15.0 pp, respectively, with the remaining percentage points for the rest of the world. At the world level, there seems to be no one world region (with its own distinctive economic system) that is big enough to dominate other world regions (and their related economic systems).

Second, what are the future directions of the western economic system, or for that matter in the eastern economic systems? These are dependent on world events which are unknown. A couple of years ago globalization was taken for granted. Now it is retarding under the influence of the Covid epidemic and national security concerns. Globalization is being confronted with major challenges in a world with different operating systems and different national interests. Protection of national interest is gaining more weight as the scope and extent of digitalized informational settings are skyrocketing.

In general, it can be expected that interactive transactions between two differing systems (regimes) of about the same size (USA and China) would lead to some degree of convergence between their operating systems and their national interests. The pure need for a world governance that satisfies divergent operating systems and national interests enforces moves for all participants toward convergency.

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