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Article

Innovative Capitalism Needs Institutional Co-Evolution

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Abstract: The fact that innovative capitalism needs institutional co-evolution has widely been recognized with respect to pro-active institutional adaptations. Examples are the rearrangement and safeguarding of supply chains or the creation of public institutions providing indispensable systemic infrastructure. These adaptations facilitate the innovative expansion of capitalism. Less attention has been paid to the fact that institutional co-evolution is also necessary where the repercussions of major innovative breakthroughs trigger social tensions and environmental damages or ecological hazards. The present paper is therefore devoted to an investigation of the latter kind of institutional co-evolution. These adaptations are usually reactive ones because critical side effects of innovations often only turn out with a delay. The causal nexus between the dynamics of innovative capitalism and the emergence of critical situations that require re-active institutional adaptations will be discussed by means of two examples. One is the crisis of the global commons, most notable the global climate change. The other example is the recent mass migration crisis. Finally, the policy options regarding necessary institutional adaptations will briefly be outlined for the two examples.

Keywords: capitalism; innovations; mass production; institutional crisis; climate change; mass migration

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1. Introduction

Innovative capitalism transforms the economy in a unique way through ever-new production technologies and ever-new goods and services (see [1]). However, the institutions in which the economy is embedded play a role in these transformations as well. To realize ever new opportunities for large-scale production—the epitome of innovative capitalism—the institutional frame needs to co-evolve. The better it is adapted to the ongoing innovative transformations of the economy, the more the productive forces of innovative capitalism can unfold. Pro-active public and private initiatives need to create legal bodies and regulations, education and research institutions, risk-spreading institutions (insurance), financial intermediaries, and so on. Furthermore, appropriate institutional adaptations must ensure the complementary provision of public goods that many systemic innovations require for their success such as the provision of streets and highways in the case of automobile technology.

Institutions and the pace of their co-evolution can foster or impede innovation-driven economic growth ([2], [3] Chap. 7, [4]). Yet, since innovative capitalism inevitably causes "creative destruction" ([5] Chap. 7), institutional adaptations are also needed for alleviating negative effects such as economic and social disruptions or environmental hazards and damages. To cope with such unwelcome side effects institutional co-evolution is needed, e.g., in the regulatory framework and/or the political governance structure (see [6] for a detailed discussion). These adaptations are typically *reactive* ones since many of the critical side effects of innovations only turn out with a delay [7,8].

The role of institutional adaptations carried out by pro-active private and public initiatives has been recognized for instance in the context of the breakthrough of general-purpose technologies. They necessitate changes in systemic infrastructure and supply chains (see [9]). The fact that re-active institutional co-evolution is also needed has found less attention. The reason may be that the causal nexus between the innovative dynamics

and the emergence of unwelcome side effects which call for institutional adaptations is often not clear. The present paper is therefore devoted to a discussion of the somewhat neglected relationships between the innovative dynamics of capitalism and re-active institutional co-evolution requirements. A better understanding of the causes of the undesired side effects and the options for adapting institutions can help policy-making in fixing the arising problems.

The argumentation proceeds as follows. Section 2 explains a genuine technological feature of innovative capitalism, namely its reliance on innovative large-scale production —or mass production—based on the employment of accumulated capital goods. This feature is the key to understand how innovative capitalism generates prosperity but also unwelcome side effects. Section 3 turns to the discussion of the institutional adaptations required for the unfolding of innovative capitalism. Distinguishing between spontaneously occurring, pro-active adaptations on the one side and re-active adaptations on the other, the focus is on the re-active ones that are needed to deal with the unwelcome side effects. Section 4 looks into the case of unintentionally caused environmental damages and ecological hazards and points out how re-active institutional adaptations can be, and often have been, implemented successfully to cope with these unwanted side effects. Section 5 explores a case in which innovative capitalism conquers new markets with the side effect of contributing in an unexpected way to social disruptions elsewhere, namely to the growing international migration flows that necessitate institutional adaptations. Section 6 presents the conclusions.

2. How the Expansion of Innovative Capitalism Creates Riches by Realizing Ever New Scale Economies

"Capitalism" means different things to different writers. Indeed, an economy considered "capitalist" has many different facets to which one can refer (see [10] for a discussion). It is useful therefore to clarify what facet the interpretation in the present paper focuses on. Evidently, basing the production process on real capital—i.e., means of production such as machines, vehicles, computers, buildings, and the necessary fuels and intermediate materials—is a constituent technological feature of capitalist economies (Note that the technological mode of production is independent of the mode of ownership in the means of production, whether private or public. If the lion's share of capital is publicly owned as in socialist economies this is often referred to as "state capitalism", see [11]). For deploying such means of production, capital has to be accumulated in the first place.

The capital-based mode of production is suitable (i) where goods and services can be standardized and (ii) where the various steps of their production process can be decomposed and standardized as well. Production, i.e., the transformation and relocation of materials or the carrying out of services, can then be transferred from human craftsmanship to properly constructed and programmed machinery, transport facilities, etc. (An additional proviso is that non-anthropogenic energy can be made available and applied at the point of use). Once human skills and knowledge have been programmed into machinery, the machine services can be replicated over and again, faster and more reliably in parallel with little or no extra labor being needed [12]. The result is large-scale or mass production that enables the realization of scale economies [13]. The latter reduces unit costs and boosts labor productivity. In short, taking advantage of scale economies is the origin of the riches that capitalism creates and a main motive for accumulating capital goods (whether under private or public ownership).

Classical writers such as Adam Smith, Ricardo, and Marx have already been aware of the benefits of capital-based mass production when, at their time, industrial manufacturing emerged. More recently, human labor services are again transferred in a major wave to a capital-based, automatized mass production mode. This time labor is replaced by computers and other digital equipment in communication, information processing, controlling, and administrative tasks. Furthermore, massive capital investments are necessary (as is the availability of non-anthropogenic energy flows). The result is once more that scale

economies are realized, unit costs are reduced, the productivity of (the remaining) labor services is boosted, and new riches are being created.

The accumulation of capital is a necessary but not sufficient condition for the conversion of craftsmanship and other labor services into large-scale manufacturing. Without technological innovations usually embodied in the capital goods installed on the shop floor capitalism cannot unfold. Equally important is the development of new sales channels through which the emerging mass output can be marketed. If these technological and organizational innovations are missing or fail, scale economies and the corresponding growth of the economy cannot be realized. More recent writers have therefore claimed that technological innovations are an engine of economic growth [14] and hailed them as "Prometheus unbound" [15]. The more innovativeness is pushed, the more prosperity can be created in an economy (see [1,16]).

The positive effects of technological innovations on the evolution of the economy are obvious. They are ultimately due to entrepreneurially minded agents willing to engage in searching for, developing, and eventually carrying through innovations with highly uncertain chances. When connected with investments into innovative mass production the motivation of the decision makers usually is to create new profitable business opportunities, often beyond the established businesses in which they are already engaged. (In the case of inventors and scientists other, non-pecuniary (intrinsic) motivations such as curiosity and the expected satisfaction derived from successful problem-solving behavior seem to play an important role. References to these motives can be found in the history of inventions, e.g., [17,18]. Non-pecuniary motivation has also been suggested by Schumpeter in [19], Chap. 2 for explaining the driving force of path-breaking entrepreneurship). To put profit motivation in context with profit making opportunities, consider a competitive market. Firms in such a market can only make profits if they have a competitive advantage over rivalling firms. Investing in innovative mass production (which allows to realize scale economies and, hence, reduces unit costs) constitutes such an advantage. The proviso is that there are competitors with higher costs, especially producers still relying on handcraft manufacturing or labor-intensive, customized information processing techniques. Such producers are sooner or later driven out of the market. An additional advantage arises to mass producers if, by being able to reduce the price, the scope of the market can be vastly expanded. (As a result of the ICT revolution this can now be observed to happen in sectors of the economy that have traditionally been highly labor-intensive service industries. Digitalization and massive investments into ICT capital allow standardization and automatization and, hence, a large scale or mass production of information services and other intangible goods. Examples: the recent rise of the fintech industry or platform-based service mediators, see [20] for the latter example).

However, after the competitive transformation of the market, the only remaining competitors are mass producers themselves. Because of the scale economies, they all face a falling unit-cost curve. Under these conditions, any of the surviving firms can only gain a competitive advantage if, by enlarging the production capacity, the firm moves down the unit-cost curve ahead of the competitors to undercut the costs and prices of the competitors lagging behind. Yet, all surviving firms in the industry have an incentive to do so, and they have to make a decision under uncertainty regarding the moves of their competitors. Production capacities in the industry therefore tend to be expanded concurrently while the markets for the mass-produced goods and services do not expand indefinitely. Following a logistic (S-shaped) trajectory, the growth of demand levels off once the market is saturated and replacement demand dominates the sales [21,22].

As already described by Schumpeter ([19] Chap. 6) the competitive expansion of the production capacities thus tends to run into an excess supply that puts profit margins under pressure. (A possible measure to evade competitive pressure is market segmentation by means of product differentiation. But since the production of differentiated products tends to reduce the scale economies and, hence, raise unit costs, this measure is the more promising, the larger a firm's output—that can be differentiated—already is. Product

differentiation is therefore a typical measure to stabilize profit margins in markets with only a few, large oligopolists remaining as producers after a more or less ruinous shake-out phase. According to the theory of industrial life cycles, a market structure like this is typical for mature industries [23]). Dwindling profit margins are the reason for why decision-makers in established businesses look for new profitable business opportunities, anticipating or reacting to an emerging profitability crisis in the industry. Two typical innovation strategies which firms pursue to evade the profit decline are of particular interest here because they focus on innovative changes related to large-scale production.

One strategy aims at an innovative reorganization by which scale economies can be extended through opening up new markets outside the presently served geographical region for the (already existing) mass-produced goods and services. A competitive advantage in the new regions is especially likely if the local markets are still served by traditional, labor-intensive (craft) products as in many developing economies. (I leave aside here geographical expansion as a by-effect of off-shoring mass production operations to less developed countries. This is usually motivated by saving labor costs and/or avoiding regulatory costs [24]). The other innovative strategy aims at creating new goods and services suitable for mass production. A competitive advantage can be expected to be gained by this strategy if a market develops that has the potential for substantial growth of the demand for the new products (as required for realizing scale economies on the production side). This is especially likely to happen in the case of new consumer goods and services that are able to concur domains of life which have so far not, or not to the same extent, been served by large-scale production methods.

In fact, the expansion of innovative mass production into ever new domains of life has already a long history. There are many well-known examples such as the various vintages of vehicles—first of all, the automobile (unlocking mobility needs for being served by mass-produced means). Various vintage household appliances can also be mentioned (serving convenience needs). More recent examples are audio and video consumer electronics and complementary content (unlocking information and entertainment needs), or package tour services (unlocking the domain of leisure and recreation needs). Right now, prominent examples include the manifold of goods and services related to the internet, mobile telephony, social media services, and other new forms of interactive communication. They have been able to open up the immense commercial potential of mass products in the domain of socializing and bonding needs, be it in the form of hardware, software, or content.

3. Why the Expansion of Innovative Capitalism Requires Institutional Co-Evolution

The expansion of innovative capitalism goes hand-in-hand with a restructuring of production, commerce, and consumption. This puts adaptation pressure on the institutions in which the economy is embedded. When the commercialization in many domains of life increases, value creation chains get longer and more anonymous. Professional life is transformed and consumer culture changes. As a consequence, informal institutions such as customs, social norms, and traditional ethical values may become dysfunctional and mutate or disappear. Formal institutions are reshaped or newly designed at public or private discretion so as to enhance the performance of the expanding innovative capitalism. This often happens in a pro-active mode that anticipates the need to make adaptations.

A prominent example of public engagement is the pro-active shaping of "national innovation systems" [25,26] that governments in many countries are concerned with in recent decades. National innovation systems are made up of formal institutions for education and training and applied and basic research. The quality and adaptability of these institutions influence the rate with which innovations occur in an economy and their transformative potential (or quality). In fact, the innovative expansion of large-scale production methods and mass-produced goods and services would not have been possible without the co-evolution of such mostly public institutional support.

Private pro-active endeavors that push the co-evolution of formal institutions include entrepreneurial moves that redesign market institutions to adapt them to changing or newly emerging systemic dependencies. This has been broadly discussed and explained, for example, in the works on general-purpose technologies. They enable new forms of innovative mass production which require organizational and institutional transformations of the inter-dependent supply chains and sales channels (see [9] for a survey). The creation of new institutions sometimes also happens through private initiatives, where newly developing contractual relationships demand protection, e.g., by private or semi-public institutions such as arbitration courts or default insurances. Complementary governmental action is often also necessary. In the case of systemic innovations, it is required for initiating a complementary provision of public goods such as the planning, financing, and creating or adapting of infrastructure (see [27] for a case study). In many other cases, a regulatory framework needs to be provided, e.g., in the fintech industry [28].

However, institutional change and redesign are not always proactive, especially when the expansion of innovative capitalism develops unintended negative side effects. Among them are the social and economic disruptions caused by the introduction of innovative mass production methods. Producers who use traditional production techniques and/or offer traditional substitutes have to prematurely write off investments in both capital and human capital (specific skills). Business owners and labor lose their income sources. New ones are frequently difficult to find with the consequence of serious impoverishment that can lead to social unrest. Another kind of unwelcome effect occurs where the expansion of innovative capitalism results in environmental damages and ecological hazards. Policy making can try to remedy the unintended effects by adapting the institutional framework. Such attempts are more likely undertaken in democracies where policy-making is under political pressure from the constituency. However, in any case, adaptation efforts are typically reactive because the critical secondary effects of the innovative dynamics fully turn out only with a delay. These effects and their social costs are often neglected in innovation research. A thorough analysis is warranted, though, for assessing the institutional co-evolution needs that arise in the aftermath of innovative breakthroughs.

The two strategies by which producers try to counter falling profit margins (which result from their competitive parallel capacity expansion) are a case in point. There is a rather trivial cause for why critical side effects result here. The expansion of large-scale production methods either into new markets or into new domains of life also expands the number of economic agents who are inter-connected by transactions and information flows. The result is, on the one hand, that with the growing size of the newly inter-connected collective of individuals the anonymity within the collective increases. On the other hand, the heterogeneity of the agents increases. This can lead to unexpected consequences as will be explained in two different examples in the next sections.

4. How Institutional Co-Evolution Pressure Emerges from the Geographical Expansion of Mass Production: The Case of the Global Commons

When, as a consequence of the geographical expansion of innovative large-scale production, a greater number of economic agents start to interact, and a new collective of individuals is formed. This collective is not only larger but also more heterogeneous and the interactions are by necessity more anonymous. Growing size, heterogeneity, and anonymity taken together mean that the behavior of the agents in the enlarged collective is less mutually socially controlled and constrained than before. As a consequence, informal institutions—customs, social norms, values, and ethical principles—are weakened. They can lose their effectiveness as safeguards against negligent or even guileful, individual behavior that pays no heed to damages caused for others. The same holds for the effectiveness in this regard of existing formal institutions. (There is always a latent conflict between the individual pursuit of self-interest and the protection of the interests of other individuals in a collective due to the ambivalence of human social behavior dispositions [29,30]. On the one hand, humans are inclined to pursue their interests in a self-seeking manner. On

the other hand, they also harbor a disposition of showing empathy, loyalty, and willingness to cooperate and help. The latter behavior is frequent among kin ([31], Chap. 5) but occurs also within small, intensely socializing groups when they succeed in sanctioning self-seeking and anti-social individual behavior of group members by social ostracism and the spontaneous formation of "blocking coalitions" [32]. A high frequency of rewarding face-to-face interactions and social learning processes can foster identification with, and loyalty in, such groups. This results in pro-social attitudes and a high degree, of mutual trust and cooperation within the group [33,34]).

The growing number of agents involved in interactions is not the only effect caused by the geographical expansion of industrial mass production. There is also an effect of blowing up the "industrial metabolism" [35] to a global scale, i.e., the throughput of materials and (mostly fossil) energy in production. The materials and energy necessary for mass production have to be tapped, processed, and eventually disposed of in the form of material and thermic waste. Both effects together cause a serious problem. Where weakened formal and informal institutional safeguards do not prevent this, producers with self-seeking inclinations can be tempted to save (private) costs by overuse of natural resources and negligence with respect to waste disposal. If some producers take advantage of the cost-saving, competitive market pressure forces all producers to adopt these defective practices. If they refrain from doing so, they face the risk of being driven out of the market. A "race to the bottom" is set in motion with the result of a degradation of natural resources and a threat to the resilience of sinks in the environment into which waste is disposed of.

Such competitive dynamics could be observed during the industrialization in the 19th and 20th centuries in Europe and North America. The environmental problems that had been caused before by the traditional, small-scale manufacturing methods had been handled more or less informally at the level of the local community. With the nationwide expansion of the capitalist mode of production, the size of the collective of agents connected by production and trade grew beyond the local level and became more anonymous. As a consequence, local institutional safeguards against producer negligence and exploitation were undermined. Competitive pressure favored careless production practices. Severe degradation of air, water, soil, and other collective resources occurred nationwide in all regions that had attracted industry [36].

Today, the developing economies to which mass production has increasingly been extended in the past decades confront a similar situation. Their formal and informal institutions are no longer able to prevent the degradation of the common environmental resources. Much as during the industrialization in Europe and North America, overuse of, and negligence towards, these resources pay off for producers in terms of lower production costs. As a result, material and thermal waste emission that pollutes the air, water, and land, depletion of non-renewable resources, degradation of soil and natural biomass, biodiversity loss, etc. are soaring in most industrializing economies.

Because of the vast size and huge population of the now industrializing countries, the environmental impact of their growing mass production exceeds the damages of the past. The conflict between individual and collective interests has become a global one and threatens to exceed the "planetary boundaries" [37,38] at which the resilience of many of the global commons, i.e., natural resources and sinks, is jeopardized. This is most obvious now in the case of the ongoing climate change (global warming) that is caused by the growing CO_2 emissions into the atmosphere.

However, the expansion of innovative capitalism has also forged a new collective in charge of solving the problem of the global commons by adequate institutional adaptations. This new collective consists of the governments of all economies now inter-connected by production and trade channels. To prevent a global race to the bottom with disastrous consequences for humankind, this new collective urgently needs to introduce institutional changes at the international level. In view of the tipping points beyond which the global resilience of some physical and biological processes may soon be lost (as is widely recognized now with respect to the global warming process), the window of opportunity for a

successful institutional co-evolution is narrowing down. Time for proceeding like in the past at the national level in Europe and North America is not available. National policy-making there needed more than a century to reduce the fallout of the growing industrial metabolism. Nonetheless, the environmental regulations and taxation schemes that have been created still have not succeeded in fully accomplishing the goal of sustainability.

The problem in the "Old World" was that any step forward in the political implementation process was heavily opposed by producer associations and often also labor unions. They evoked fears of hardship by predicting cost increases, competition disadvantages, and job losses. In this way they were, and still are, able to delay the necessary institutional adaptations by forming blocking coalitions in the political decision-making. The countermeasure that proved effective in overcoming the blocking influence of these interest groups was an age-old device: campaigning for the organization of "reverse blocking coalitions" [32]. Such coalitions were able to push through protective environmental standards and regulations.

The device works well in countries with a democratic governance regime. Their constitutional frame enables the majority of voters (and often even a minority with log-rolling power) to create governmental institutions that enforce compliance with environmental protection measures. (An effective working of executive and judicative powers inspired by a professional ethos of impartiality is an essential advantage as well [39]) However, for the newly forged global collective of governments, no such constitutional frame exists yet. National governments within the collective which oppose the now necessary international institutional adaptions cannot be voted down by a majority decision. Moreover, under pressure from the national producer organizations and labor unions, they are often tempted to freeride on voluntary agreements.

In consequence, the new, global collective is split up into different camps. On one side, there are several countries in which domestic "green" campaigning has succeeded in establishing reverse blocking coalitions at home. The governments of these countries now engage in an inter-governmental coalition propagating international institutional regulations of the use of global commons such as with respect to CO_2 emissions into the atmosphere. On the other side, there are countries rejecting binding international institutional adaptations. Correspondingly, the international agreements that have so far been reached in relation to the global commons are non-binding ones. They depend on the goodwill of countries and governments to sign them and to indeed honor their commitments. Not surprisingly, the progress accomplished with respect to the protection of the global commons is limited. (The 1997 Kyoto Protocol and the 2015 Paris Climate Agreement—which were supposed to solve the global warming problem—and their problems are a telling example [40,41]). In addition, the pace at which progress is made is too slow to cope with the fact that time is running out.

To accelerate a solution to the problem international policy-making can again follow the old template: intensify the international campaigning for a reverse blocking coalition of governments endorsing the creation of binding institutional constraints. Such campaigning can use mass media, the internet, and social media to propagate information on the urgency of an institutional co-evolution. Where the information flows are not restrained by the government, they may influence national voting behavior in the direction of supporting the necessary international institutional adaptations. In addition, forming reverse blocking coalitions can resort to side payments to governments disinclined to protect the global commons in their national territories unless they receive such payments. If this does not work, invoking economic sanctions such as trade restrictions on non-complying governments can be considered—most likely with significant own costs for the countries supporting them.

The window of opportunity for international institutional adaptations by which the unintended concomitants of the expansion of innovative capitalism can be cured is closing. While the campaigning for a reverse blocking coalition may already be underway, the immediate, urgent advice for policy making at the international level is that the institutional co-evolution needs to be accelerated in historically unprecedented ways.

5. How the Innovative Expansion into New Domains of Life Creates Institutional Co-Evolution Pressure: The Case of Rising International Migration Flows

When, as a result of an increasing scale of mass production, market competition intensifies and profit margins fall, producers often opt for the second innovative expansion strategy mentioned (see Section 2). They try to restore profitability by introducing new goods and services. Particularly in the consumer goods industries, they can try to create innovations by which they can open up and expand mass production to new domains of life. What socioeconomic repercussions this strategy may have depend on the particular properties of the innovations. The case to be discussed in this section is that of consumer innovations created by the information and communication technology (ICT) industries and the affiliated social media industry.

By means of large-scale production methods markets for cheaply produced hardware, software, content, and transmission services have been created that now serve a domain of life that has not (to the same extent) been served by mass production before. This is the domain of needs and wants related to communication, entertainment, socializing, and bonding activities. However, via a complex causal chain, this expansion strategy has also triggered an unintended secondary effect in an entirely different domain. As will now be argued, the newly developed goods and services contribute rather unexpectedly to the recent increases in the international migration flows, i.e., the growing number of individuals crossing borders with the intention to seek residence outside their home country.

The unintended effect is ultimately again due to the fact that innovations have forged a new and much larger, global community of agents where, in this case, it matters that they are inter-connected by information flows. The industries provide cheap access to the internet, electronic media services (mostly financed by third parties seeking new advertising channels) and mobile telephony. As a result, everyone can now retrieve and exchange information on almost everything, everywhere, at low or no pecuniary costs. The new abundance of information has an impact on the recipients' beliefs and aspirations and invites them to engage in social and cultural comparisons regarding their own living conditions.

A huge, and often the most forceful, part of the now abundantly available information is content commercially produced by the advertising and entertainment industry. The content deals predominantly with "First World" subjects and images and tends to paint a biased, notoriously rosy picture of that world. (With the focus on the well-to-do and their affluent laissez-faire lifestyle the problems of the less well-to-do find little mention). Recipients of this information not living in the First World have few, if any, means to assess how representative of the real conditions this information is. These recipients may therefore be lured into unrealistic comparisons. The biased content tends to impress especially the receptive younger people and may lead to an illusionary and wishful identification with the phantom of a global community of young and dynamic (Western) people. As a consequence, their attitude towards their own living conditions and culture tends to be altered. Adherence to informal institutional constraints (traditions, customs, and social norms) tends to be eroded.

By looking at the decision-making of potential migrants in this light it is easy to identify the nexus between the innovative expansion of the ICT and social media industries and the rising international migration flows. Humans actually have a natural tendency to identify themselves with, and feel emotionally tied to, the place and the social environment in which they have been socialized and with which they frequently interact [33,34]. Local pride customarily translates into loyalty that usually extends to the own nation. However, a strong deprivation of basic needs, particularly when politically caused, can trigger frustration and damage the binding force of the emotional ties [42]. Anger and despair undermine loyalty so that the agents see themselves confronted with an "exit or voice" dilemma [43]. This means considering turning one's back on one's home country in the hope of conducting a better life elsewhere. Or deciding to stay on and press for improvements,

i.e., voice opposition more or less violently. In such a situation it matters whether or not information on how life is (or appears to be) in other places is easily accessible.

For different reasons, parts of the population in several regions of the Middle East, Africa, Latin America, and Asia indeed suffer from precarious living conditions. (In the affected countries capital accumulation and educational standards are low, unemployment is high, and economic development stagnates [44,45]. Apart from the anarchy of civil war and the persecution of minorities the main reason are "neo-patrimonial" governance structures [46], characterized by authoritarian rulers, a lack of institutional checks and balances, corruption, a paralyzed rule of law, political repression, and the antagonism of wealthy elites and widespread poverty of the rest of the population). Yet, even the deprived people in these countries can afford the cheap, mass-produced ICT tools and gain access to the internet and social media. Where a lack of information on what awaits a migrant in foreign places has previously prevented thinking of exiting one's home, such information is now omnipresent and may nourish more or less illusionary expectations regarding the consequences of an exit. Not surprisingly, the number of exits, i.e., of emigration decisions, grows particularly in countries with poor living conditions and comparatively low per capita income [47].

The fact that information about the destination countries—whether fake or true—plays a crucial role in the decision making of potential migrants is not new. In large migration waves in the past, foreign governments which actively solicited immigration recognized the power of rosy information. Lacking the means of present-day mass information dissemination these governments employed promotion agents instead for their agitation in the countries of origin. These agents tried to attract migrants with information promising significant personal benefits to be in store for them in the destination country. (A historical example is the active advertisement of land grants by colonial agencies in Great Britain, the Netherlands, Portugal, and Spain in the 17th and 18th centuries, see [48]. Further examples relate to migration flows within Europe such as the (re-) settlement of previously Turkish-occupied Southeast Europe from the 16th to the 18th century or the settlement of Jews and Huguenots in different European constituencies on the initiative of the respective rulers. Active immigration programs also encouraged the 19th-century migration wave from Europe to North America, see, e.g., [49]).

Today, countries facing unsolicited mass immigration particularly in Europe and North America (see [50]) are far from any active promotion of migration. Their governments are under pressure from large fractions of their voters who disapprove of massive immigration, particularly of migrants with strongly differing cultural backgrounds [51,52]. Governments therefore discourage or even try to deter an unauthorized entry of migrants. Nevertheless, huge numbers of especially younger migrants are presently traveling over long and dangerous migration routes and incur substantial costs with the expectation to eventually be able to conduct a better life in Europe or North America. While not intended, advertising and entertainment industries and social media thus seem to act as if they were modern immigration propagation agents. (The often dis-illusioning experience that migrants make in the destination countries—see [53]—is reported back home via mobile phone communication and social media in a filtered way. It has been found to influence the direction of the migration flows across the destination countries [54], but not the emigration decision as such. Reports of a diaspora community in the destination countries, poor as it may be, strengthen the pro-exit bias further and become a migration pull factor [55]).

With unintended side effects, the expansion of innovative mass production thus contributes to social disruptions in both the countries of origin and the destination countries. The former lose productive human capital with the effect of weakening internal reform pressure, and the latter grapple with the consequences of unwelcome immigration. If, repelling the increasing flow of migrants more or less violently at national borders is, for humanitarian reasons, considered unacceptable, the problems cannot be resolved by unilateral, national policy-making [56]. The international migration flows have forged a new collective—this time of the governments of countries on both sides of the flow—that

needs to make corresponding institutional adaptations at the international level. These adaptations have to make sure that a multilaterally coordinated policy response can work in such a way that ultimately the balance between the "exit or voice" options of potential migrants is shifted away from the pro-exit bias.

Theoretically, this could be accomplished by cutting off the global information flows which the innovative expansion of mass-produced information software and hardware has made possible. While technically feasible (as the practice of several dictatorial regimes shows), this option would face serious objections on normative grounds. Ways must therefore be found that reduce the (often mis-conceived) incentive to emigrate. A frequently discussed idea is to work on an improvement of the economic, social, and political situation of potential migrants in their countries of origin. To that end, institutions could be created that organize income and knowledge transfers from the destination countries to the countries of origin. (For a detailed discussion of a whole array of national and international policy measures see [57,58]). However, success chances for this idea appear low when, in countries of origin, neo-patrimonial institutional structures exist. Such structures are not only an important cause of poverty and political repression [4] from which migrants flee. These structures would also undermine the effect of income and knowledge transfers.

To make progress with a multilateral solution to the international migration problem, it would therefore be necessary to ensure that he institutional adaptations can accomplish two goals. The one goals is to organize of a non-erratic, long-terms transfer policy. The goal is, ensure that the benefiting countries of origin overcome neo-patrimonial structures that inhibit a positive effect of the transfers. As in the case of the global commons crisis, there is a significant temptation for national governments to defect or free-ride on agreements, particularly multilateral ones. The template for arriving at international institutional contracts that are robust enough to constrain obstructing national tactics could once more be that of campaigning for a "blocking coalition". This time it would be one of national governments willing to solve the migration problem in a cooperative way. However, in this case, too, the window of opportunity for reaching an agreement and for making the institutional adaptations seems to be a rather narrow one. The slower the progress, the more do advocates gain influence in the destination countries who crusade for simply deterring and repelling migrants more or less violently at the borders.

6. Conclusions

The transformation of the economy through major innovative breakthroughs is the characteristic of innovative capitalism. New technologies and new goods and services generate ever new business opportunities that secure profitability, employment, and growth. For the success of innovative breakthroughs, it is often necessary to make complementary changes in the institutions in which the economy is embedded. Examples are the rearrangement and safeguarding of supply chains through entrepreneurial initiative or the creation of public institutions providing indispensable systemic infrastructure for innovations. These are typically pro-active institutional adaptations. However, the expansion of innovative capitalism also requires institutional adaptations in response to social disruptions and environmental damages or ecological hazards arising from major innovative breakthroughs. These are usually re-active adaptations as many critical side effects of innovations only turn out with a delay.

Since the re-active institutional co-evolution has found less attention so far than the pro-active institutional adaptations the focus in the present paper has been on the latter. The discussion started with a technological characteristic of innovative capitalism. This is the large-scale or mass production mode. It is a major driver of economic growth and prosperity. On the other hand, it has been argued to be prone to recurrent profitability crises. Two innovative expansion strategies have been discussed that motivate many of the major innovative breakthroughs. Producers can try to evade the recurring pressure on profit margins by expanding with innovative mass production into ever new regions in the world where these methods have not been used before. The other strategy is to

create innovative mass-produced goods and services, particularly in the consumer goods industries, by whichever new domains of life can be conquered where mass-produced offers have not played much of a role before.

Both of these expansion strategies forge a larger and usually more heterogeneous collective of economic agents interconnected by trade and information flows. The growing size and heterogeneity of the collectives result in more anonymous interactions. As a consequence, the adherence of the single agents to previously binding institutional constraints tends to be weakened. As has been explained, by this unintended side effect of the expansion of innovative mass production, critical changes in individual behavior can be triggered. These changes can cause unwelcome developments that call for—usually re-active—institutional adaptations.

One case in which a crisis is triggered and a re-active institutional co-evolution is needed has been argued to result from the innovative expansion strategy to ever new regions. In many of the countries that are now industrializing (i.e., introducing large-scale production methods), the existing—national—institutional constraints are not prepared to prevent producers from exploiting and degrading common natural resources. Competitive pressure tends to induce a "race to the bottom" in this respect. The consequence is an extension of the crisis of the commons (natural resources and sinks) to a global level, most notable now in the form of global warming. To adapt the institutional basis to the format of the new, global collective, the regulatory framework needs to be tightened in all countries. Furthermore, international institutional safeguards against the free-riding of national governments need to be created. History teaches that the adaptation of institutions to such an extended number of international actors takes substantial time. But with the degradation of some of the global commons rapidly approaching critical tipping points, time seems to be running out. In this case, the challenge for reactive policy-making is therefore not only to figure out what institutional adaptations at the international level suit to fix the problems that have emerged. The even greater challenge is to successfully realize these adaptations at an unprecedented speed.

The second case that has been discussed is that of the new, global collective of economic agents interconnected by more or less anonymous international information flows. This collective has emerged from the innovative expansion of the ICT industries and the affiliated social media industry. Non-existent just a few decades ago, these industries now serve needs and wants related to communication, entertainment, socializing, and bonding activities by means of mass produced offers. An unintended side effect is the global availability of positively biased, and partly illusionary, information on an affluent standard of living and a lavish lifestyle allegedly prevailing in the "First World". As an unintended consequence, the decision of potential migrants on whether or not to leave their home country can be biased in a pro-emigration direction. The innovative expansion of large-scale production has therefore been argued to be conducive to, and partly to enable the massively increasing international migration flows. The resulting social disruptions in both the countries of origin (losing human capital) and the destination countries (facing unwanted immigration pressure) call for an institutional co-evolution. To avoid violent culminations of the problem, adaptations in national and international political governance are urgently needed of which some have briefly been discussed.

Unwelcome side effects of the innovative dynamism of capitalism have so far found less attention in the innovation literature than they deserve. Consequently, the re-active institutional adaptations necessary to compensate for these effects have drawn less attention than the pro-active institutional co-evolution needs arising particularly in the context of systemic innovations. As it has turned out, the emergence of unwelcome side effects often follows complex causal chains. Their understanding is a precondition for helping policy-making in raising the effectiveness and speediness of re-active institutional co-evolution. In future research, this understanding needs to be broadened by identifying and analyzing further cases of unwelcome side effects to strengthen the conclusions drawn from the two cases that have been discussed exemplarily.

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References

1. Yun, J.J.; Won, D.; Park, K. Entrepreneurial Cyclical Dynamics of Open Innovations. *J. Evol. Econ.* **2018**, *28*, 1151–1174. [CrossRef]
2. Rosenberg, N.; Birdzell, L.E., Jr. *How the West Grew Rich—The Economic Transformation of the Industrial World*; Basic Books: New York, NY, USA, 1986.
3. Mokyr, J. *The Gifts of Athena—Historical Origins of the Knowledge Economy*; Princeton University Press: Princeton, NJ, USA, 2002.
4. Spolaore, E.; Wacziarg, R. The Diffusion of Institutions. In *Complexity and Evolution—Toward a New Synthesis for Economics*; Wilson, D.S., Kirman, A., Eds.; MIT Press: Cambridge, MA, USA, 2016; pp. 147–166.
5. Schumpeter, J.A. *Capitalism, Socialism and Democracy*; Harper & Brothers: New York, NY, USA, 1942.
6. Witt, U. Innovations. Externalities, and the Problem of Economic Progress. *Public Choice* **1996**, *89*, 113–130. [CrossRef]
7. Binder, M.; Witt, U. As Innovations Drive Economic Change, Do They Also Improve Our Welfare? In *Understanding Economic Change—Advances in Evolutionary Economics*; Witt, U., Chai, A., Eds.; Cambridge University Press: Cambridge, UK, 2019; pp. 343–368.
8. Tenner, E. *Why Things Bite Back—Technology and the Revenge of Unintended Consequences*; Alfred A. Knopf: New York, NY, USA, 1996.
9. Bresnahan, T. General Purpose Technologies. In *Handbook of the Economics of Innovation*; Hall, B.H., Rosenberg, N., Eds.; Elsevier: Amsterdam, The Netherlands, 2010; Volume 2, pp. 761–791.
10. Hodgson, G. Varieties of Capitalism: Some Philosophical and Historical Considerations. *Camb. J. Econ.* **2016**, *40*, 941–960. [CrossRef]
11. Alami, I.; Dixon, A.D. State Capitalism(s) Redux? Theories, Tensions, Controversies. *Compet. Chang.* **2020**, *24*, 70–94. [CrossRef]
12. Langlois, R.N. Scale, Scope, and the Reuse of Knowledge. In *Economic Organization and Economic Knowledge*; Dow, S.C., Earl, P.E., Eds.; Edward Elgar: Cheltenham, UK, 1999; pp. 239–254.
13. Young, A.A. Increasing Returns and Economic Progress. *Econ. J.* **1928**, *38*, 527–542. [CrossRef]
14. Mokyr, J. Long-Term Economic Growth and the History of Technology. In *Handbook of Economic Growth*; Aghion, P., Durlauf, S.N., Eds.; Elsevier: New York, NY, USA, 2005; Volume 1, Pt B, pp. 1113–1180.
15. Landes, D.S. *The Unbound Prometheus: Technological Change and Industrial Development in Western Europe from 1750 to the Present*; Cambridge University Press: Cambridge, UK, 1969.
16. Fagerberg, J.; Srholec, M.; Knell, M. The Competitiveness of Nations: Why Some Countries Prosper While Others Fall Behind. *World Dev.* **2007**, *35*, 1595–1620. [CrossRef]
17. Mokyr, J. *The Lever of Riches—Technological Creativity and Economic Progress*; Oxford University Press: Oxford, UK, 1990.
18. Usher, A.P. *A History of Mechanical Inventions*; Courier Dover Publications: New York, NY, USA, 1954.
19. Schumpeter, J.A. *Theory of Economic Development*; Harvard University Press: Cambridge, MA, USA, 1934.
20. Lee, J.; Suh, T.; Roy, D.; Baucus, M. Emerging Technology and Business Model Innovation: The Case of Artificial Intelligence. *J. Open Innov. Technol. Mark. Complex.* **2019**, *5*, 44. [CrossRef]
21. Jovanovic, B.; MacDonald, G.M. The Life Cycle of a Competitive Industry. *J. Political Econ.* **1994**, *102*, 322–347. [CrossRef]
22. Klepper, S. Industry Life Cycles. *Ind. Corp. Chang.* **1997**, *6*, 145–181. [CrossRef]
23. Klepper, S. Firm Survival and the Evolution of Oligopoly. *Rand J. Econ.* **2002**, *33*, 37–69. [CrossRef]
24. Levinson, A.; Taylor, M.S. Unmasking the Pollution Haven Effect. *Int. Econ. Rev.* **2008**, *49*, 223–254. [CrossRef]
25. Edquist, C. Systems of Innovation—Perspectives and Challenges. In *The Oxford Handbook of Innovation*; Fagerberg, J., Mowery, D., Nelson, R.R., Eds.; Oxford University Press: Oxford, UK, 2004; pp. 181–208.
26. Lundvall, B.-Å. (Ed.) *National Systems of Innovation. Towards a Theory of Innovation and Interactive Learning*; Pinter Publishers: London, UK, 1992.
27. Yigitcanlar, T.; Wilson, M.; Kamruzzaman, M. Disruptive Impacts of Automated Driving Systems on the Built Environment and Land Use: An Urban Planner's Perspective. *J. Open Innov. Technol. Mark. Complex.* **2019**, *5*, 24. [CrossRef]
28. Goo, J.J.; Heo, J.-Y. The Impact of the Regulatory Sandbox on the Fintech Industry, with a Discussion on the Relation between Regulatory Sandboxes and Open Innovation. *J. Open Innov. Technol. Mark. Complex.* **2020**, *6*, 43. [CrossRef]
29. Brown, G.R.; Richerson, P.J. Applying Evolutionary Theory to Human Behavior: Past Differences and Current Debates. *J. Bioeconomics* **2014**, *16*, 105–128. [CrossRef]
30. Henrich, J. *The Secret of Our Success*; Princeton University Press: Princeton, NJ, USA, 2016.
31. Wilson, E.O. *Sociobiology. The New Synthesis*, 25th ed.; Belknap Press of Harvard University Press: Cambridge, MA, USA, 2000.
32. Boehm, C. *Hierarchy in the Forest: The Evolution of Egalitarian Behavior*; Harvard University Press: Cambridge, MA, USA, 2001.

33. Baumeister, R.F.; Leary, M.R. The Need to Belong: Desire for Interpersonal Attachments as a Fundamental Human Motivation. *Psychol. Bull.* **1995**, *117*, 497–529. [CrossRef] [PubMed]
34. Brewer, M.B.; Caporael, L.R. An Evolutionary Perspective on Social Identity: Revisiting Groups. In *Evolution and Social Psychology*; Schaller, M., Simpson, J.A., Kenrick, D.T., Eds.; Psychology Press: New York, NY, USA, 2006; pp. 143–161.
35. Ayres, R.U.; Simonis, U.E. Industrial Metabolism: Theory and Policy. In *Industrial Metabolism: Restructuring for Sustainable Development*; Ayres, R.U., Simonis, U.E., Eds.; United Nations Press: New York, NY, USA, 1994; pp. 3–20.
36. Hanlon, W.W.; Tian, Y. Killer Cities Past and Present. *Am. Econ. Rev.* **2015**, *105*, 570–575. [CrossRef]
37. Rockström, J.; Steffen, W.; Noone, K.; Persson, Å.; Chapin, F.S., III; Lambin, E.; Lenton, T.M.; Scheffer, M.; Folke, C.; Schellnhuber, H.J.; et al. Planetary Boundaries: Exploring the Safe Operating Space for Humanity. *Ecol. Soc.* **2009**, *14*, 32. [CrossRef]
38. Steffen, W.; Richardson, K.; Rockström, J.; Cornell, S.E.; Fetzer, I.; Bennett, E.M.; Biggs, R.; Carpenter, S.R.; De Vries, W.; De Wit, C.A.; et al. Planetary Bounderies: Guiding Human Development on a Changing Planet. *Science* **2015**, *347*, 1259853. [CrossRef]
39. Wegner, G. Defensive Modernization in Germany and in the Habsburg Empire—A Historial Study of Capitalist Transformation. *J. Inst. Econ.* **2016**, *12*, 443–469.
40. Bodle, R.; Donat, L.; Duwe, M. The Paris Agreement: Analysis, Assessment and Outlook. *Carbon Clim. Law Rev.* **2016**, *10*, 5–22.
41. Nordhaus, W.D. Climate Clubs: Overcoming Free-riding in International Climate Policy. *Am. Econ. Rev.* **2015**, *105*, 1339–1370. [CrossRef]
42. Dustmann, C.; Okatenko, A. Out-migration, Wealth Constraints, and the Quality of Local Amenities. *J. Dev. Econ.* **2014**, *110*, 52–63. [CrossRef]
43. Hirschmann, A.O. *Exit, Voice and Loyalty*; Harvard University Press: Cambridge, MA, USA, 1970.
44. Acemoglu, D.; Johnson, S.; Robinson, J.A. Reversal of Fortune: Geography and Institutions in the Making of the Modern World Income Distribution. *Q. J. Econ.* **2002**, *117*, 1231–1294. [CrossRef]
45. Barton, S. Why Zambia failed. *J. Inst. Econ.* **2015**, *11*, 803–821. [CrossRef]
46. Eisenstadt, S.N. *Traditional Patrimonialism and Modern Neopatrimonialism*; Sage: London, UK, 1973.
47. Nino-Zarazua, M.; Roope, L.; Tarp, F. Global Inequality: Relatively Lower, Absolutely Higher. *Rev. Income Wealth* **2017**, *63*, 661–684. [CrossRef]
48. Page, M.E.; Sonnenburg, P.M. *Colonialism: An International Social, Cultural, and Political Encyclopedia*; ABC-CLIO: Santa Barbara, CA, USA, 2003.
49. Hatton, T.J.; Williamson, J.G. What Drove the Mass Migrations from Europe in the Late Nineteenth Century? *Popul. Dev. Rev.* **1994**, *20*, 533–559. [CrossRef]
50. World Bank. *Migration and Remittance Factbook 2016*, 3rd ed.; World Bank Group: Washington, DC, USA, 2016.
51. Dustmann, C.; Vasiljeva, K.; Damm, A.P. Refugee Migration and Electoral Outcomes. *Rev. Econ. Stud.* **2018**, *86*, 2035–2091. [CrossRef]
52. Halla, M.; Wagner, A.F.; Zweimüller, J. Immigration and Voting for the Far Right. *J. Eur. Econ. Assoc.* **2017**, *15*, 1341–1385. [CrossRef]
53. Algan, Y.; Dustmann, C.; Glitz, A.; Mannig, A. The Economic Situation of First- and Second-generation Immigrants in France, Germany, and the UK. *Econ. J.* **2010**, *120*, F4–F30. [CrossRef]
54. Gorinas, C.; Pytlikova, M. The Influence of Attitudes Towards Immigration on International Migration. *Int. Migr. Rev.* **2017**, *51*, 416–451. [CrossRef]
55. Collier, P.; Hoeffler, A. Migration, Diasporas and Culture: An Empirical Investigation. *Kyklos* **2018**, *71*, 86–109. [CrossRef]
56. Cornelius, W.A.; Tsuda, T. *Controlling Immigration: The Limits of Government Intervention*; Stanford University Press: Stanford, CA, USA, 2004.
57. Collier, P. *Exodus—Immigration and Multiculturalism in the 21st Century*; Oxford University Press: Oxford, UK, 2013.
58. Hatton, T. Refugees and Asylum Seekers, the Crisis in Europe and the Future of Policy. *Econ. Policy* **2017**, *32*, 447–496. [CrossRef]