Kohl, Sebastian; Dobeson, Alexander; Brandl, Barbara

Article

Varieties of agrarian capitalism: Towards a comparative analysis of rural economies

economic sociology_the european electronic newsletter

Provided in Cooperation with:
Max Planck Institute for the Study of Societies (MPIfG), Cologne

Suggested Citation: Kohl, Sebastian; Dobeson, Alexander; Brandl, Barbara (2017) : Varieties of agrarian capitalism: Towards a comparative analysis of rural economies, economic sociology_the european electronic newsletter, ISSN 1871-3351, Max Planck Institute for the Study of Societies (MPIfG), Cologne, Vol. 18, Iss. 3, pp. 19-31

This Version is available at:
https://hdl.handle.net/10419/168388

Varieties of Agrarian Capitalism. Towards a Comparative Analysis of Rural Economies

By Sebastian Kohl, Alexander Dobeson, Barbara Brandl

Uppsala University, Sebastian.kohl@soc.uu.se; alexander.dobeson@soc.uu.se , University of Trier, brandl@uni-trier.de

Agrarian topics are notably absent from both economic sociology and the comparative political economy (CPE) literature. While the former typically deals with markets of durable consumption goods and (financial) services, the latter has its traditional focus in the manufacturing economy and its encompassing institutions.**1** So far, there is no established study of agrarian Varieties of Capitalism (VoC) in spite of the large subdiscipline of rural sociology.**2** A reason for this general neglect certainly lies in the origin of the social sciences as disciplines that studied the incipient industrialization processes in the late nineteenth century and social problems located in cities. What is more, the importance of agriculture in terms of employment and GDP share has been in decline ever since. But while academic interest in agrarian capitalism is rather low, it still makes the agenda of daily press and politics and sparks ethical debates around ownership rights, overproduction, environmental pollution and animal welfare.

This review article explores the hidden potential that lies in the comparative study of agrarian capitalism by systematically surveying classical and contemporary works in sociology and CPE that (even if implicitly) have addressed the question of what an agrarian VoC would look like. It shows that the agrarian question was of primary interest for many classical authors in sociology, whose writings contain a number of comparative dimensions (Section 1). Drawing on works in historical sociology (Section 2), we argue that even if agriculture has lost relative importance in GDP terms today, agricultural institutions – which predated industrial institutions in state formation – still have a number of path-dependent impacts on current economic and political outcomes. Finally, we show that important comparative angles can be found even in more contemporary literature, if one looks beyond the core of sociology and CPE (Section 3). This introduction, in turn, will provide some arguments for why the study of agrarian phenomena is worthwhile, countering the narrative of its overall decline.

First, even if agriculture makes up less than 3 percent of employment and GDP in industrialized countries today, more than two-thirds of the global population still lives in agricultural conditions, and the absolute number has been rising (Roser 2016). But even within industrializing countries, agriculture has been rising continuously in terms of absolute production. Though its labor productivity is lower than the industrial counterpart, as already Kuznet observed, the productivity increases since 1950 exceeded those in all parts of the economy (Federico 2005: 2). Moreover, trade in agricultural products has grown even faster than agricultural output itself (Federico 2005: 28). Food alone still makes up between 5 and 20 percent of industrial countries' exports (although this number is declining) and amounts to more than 50 percent of exports in many developing countries (Ortiz-Ospina and Roser 2016). Despite a certain convergence in these tendencies, countries have still differed considerably in the level and trajectories of their agrarian economy, as Figure 1 reveals.

See Appendix, Figure 1: Share of agricultural workforce over time

A second motivation is the long historical shadow that agriculture still casts over contemporary societies, due to the fact that state formation is tied to the agricultural sector in most countries. Moreover, the agricultural revolution often preceded the industrial one, so that state agricultural institutions, actors and laws were often already in place when the industrial ones had to be set up. Whether the agricultural and industrial revolution were complementary or competing with each other, whether agricultural development was hindering or promoting economic growth, is still subject to historical debates (Lains and Pinilla 2008).

Thirdly, agriculture, due to its land-based nature, can offer an important case for more regionally informed comparative frameworks, mimicking research on industrial regions (Storper 1997). Echoing critiques of methodological nationalism, many countries consist of economically and politically conflicting agricultural zones to be studied in their own

right. Agriculture is also a case of sectoral research for which links to the VoC framework have recently been suggested (Schröder and Voelzkow 2016). Finally, agriculture is one of the key political areas. Historically, it made up more than 70 percent of the EU budget (EU-Commission 2013). In the EU and the US, subsidies amounted to 0.5 and 0.7 percent of GDP, respectively, in 2015 and have historically been much higher; in terms of producer receipts they made up 18.6 and 9.4 percent, respectively (OECD, Agricultural support). In all party manifestos covered by the Manifesto Project since 1945, agricultural policy has a permanent place: on average, parties attributed 2.2 percent of manifesto space to this policy domain (Volkens et al. 2011: 2015a).

1 Classical comparisons of agrarian societies

Despite their neglect in contemporary economic sociology, agrarian topics were crucial for the founding fathers of the social sciences, who saw themselves confronted with the "agrarian question" and the future of the peasant class at the dawn of an increasingly modernizing industrial capitalist economy. Instead of simply assuming that industrial production and increasing urbanization would soon outdate rural life, many Classics in sociology were more concerned with the long-term impact and transformation of agrarian institutions in modern society. Hence, the early *enquête sociale* research tradition of Frédéric Le Play, or reform organizations such as the *Verein für Socialpolitik* in Germany not only focused on the urban poor, but also on bad rural living, housing or usury conditions. Until the nineteenth century, intra-rural and urban-rural conflicts were the dominant cleavage line: wheat prices strongly correlated with food protests and were a reflection of how urban-rural conflicts were solved in the "moral economy" (Thompson 1971).

Moreover, agrarian relations – and land reforms in particular – have often been highlighted as the defining factor that spurred the transformation from feudalism to capitalism. Marx already saw the enclosures of land from common to private property as the defining moment that set free the dynamics of "primitive accumulation" through agricultural modernization, which pushed the remaining peasant class to the urban centers, where the "double free" wage laborer was forced to sell his labor.3 In a similar vein, Polanyi ([1944] 2001) saw the commodification of common land as the defining moment for the emergence of the market economy. He, however, not only saw the origins of modern class conflict emerging from this development: for him, land ownership formed the foundation of different institutionalized forms of social order per se. Hence, land was not only "the pivotal element in the feudal order," but "the basis of the military, judicial, administrative, and political system" (ibid. 72-73). From this perspective, the question for Polanyi was not to what extent the "dark satanic mills" of industry have replaced agrarianism, since he regarded the commodification of land as a crucial factor that drives the transformation from feudal to market economy. Thus, for a market economy to come about, land must be treated *as if* it were produced for a market, among other "fictitious commodities." As Polanyi writes: "labor, land and money are essential elements of industry; they also must be organized in markets; in fact, these markets form an absolutely vital part of the economic system" (ibid. 75). Thus, the difference between the feudal order and the market economy is based in the different ways in which land as a factor of production is institutionalized. In fact, as late as the 1950s, more than 40 percent of the world's agrarian production was not for markets (Schüttauf 1956).

With regard to the importance of agrarian relations for the emergence of the modern market economy, it is of little surprise that Max Weber's first encounter with capitalism is also to be found in his agrarian sociology (Mommsen 2005). While Marx and Polanyi put emphasis on land ownership as a factor of production, Weber's comparative cultural analysis shifts attention to the question of to what extent different ideal-typical agrarian constitutions have nurtured or hindered the development of "rational" modern capitalism as developed in the West. Accordingly, the different paths between occidental and oriental cultures were manifested early on and are to be found in the different ways that land was appropriated and used: "[I]n Europe the transition to fixed settlement meant a change from the dominance of cattle breeding (especially for milk) to an economy dominated by agriculture, with cattle breeding continuing as a secondary element; in Asia, on the contrary, there was a shift from extensive, and hence nomadic, agriculture to horticulture without milk-cattle breeding" (Weber 1919/ 2013: 59). As a consequence of these very different patterns of land use, the private appropriation of land to individuals or groups as "commons" or "mark" never developed in Asia, nor did "the 'individualism' connected with ownership of herds, with all its consequences" (Weber 1919/ 2013: 60). Moreover, the permanent settlement and extensive workforce required for agriculture stripped rulers of their military force, making ancient Greek and Roman civilizations more similar to medieval European ones; part of the reason for a professional army in Rome lay in the decreasing number of the former farmer-soldiers, who in turn were not suitable for

more than just seasonal wars (Weber [1896] 1922). The ideal distinctions between different agrarian constitutions and ways in which labor is institutionalized on farms remain central throughout Weber's comparative analysis. Accordingly, the modern agrarian constitution is based on wage labor and organized production. On the other hand, there is the family-based farm of the Roman Republic, without wage labor and often restricted to non-market production, a form of farming that also inspired the "inner colonialization" of eastern territories by family farmers (Bergmann 1970). Although the economic system of the Roman Empire showed many features of a capitalist economy, such as "free" unskilled farm laborers, its specific agrarian constitutions – particularly its strong dependence on slaves – impeded the development of a rationally calculating conduct of life which Weber considers central for modern capitalism, and eventually led to the decline of the Roman Empire.

A later macrosociological development of Weber's idea, linking agrarian structure to political structure and opposing West and East, is found in the not uncontested works of Karl Wittfogel. In his opus magnum *Oriental Despotism* (Wittfogel 1957), he claims that large-scale irrigation systems in agriculture like those present in the Orient go along with despotic rule. Water shortages and the central hydraulic administration set up to overcome them are tools of domination which can be historically traced up to the totalitarian aspects of communistic rule in China in the 1950s.

Another classical approach can be found in the works of Weber's contemporary, Werner Sombart. In his *Modern Capitalism*, Sombart characterizes agriculture with the help of diachronic ideal types, not only when describing the transition from early to mature capitalism, but also within varieties of mature capitalism. Accordingly, land ownership can be organized in commons or privatized – in direct ownership or rent; the farm can be organized capitalistically or patriarchally, with differing and often complex distributions of mutual rights and obligations between owners and laborers; the agrarian economy can grow by colonializing extension or land-use intensity, with a corresponding increase in land rents and prices; the economic spirit can be one of subsistence farming or of profit-orientation (Sombart [1927] 1969: 93ff). From this perspective, a crucial feature of mature capitalism was the extension of mortgage credit in agriculture to meet the growing capital demands in agriculture (ibid. 100ff).

The organization of this capital can vary across time and space and is needed for land acquisition or the melioration and coverage of variable costs (seeds, labor). Capital intensity has grown over time, and particularly agriculture in the "New World" was marked by heavy initial capital investments at a time when Europe and China were largely settled (Federico 2005: 56). The long amortization periods and unpredictable rates of return within agriculture, however, have made it an unattractive borrower of short-term capital – but attractive for long-term investments in durable assets. This is not to say, however, that all agrarian mortgage regimes shared similar paths. In most European countries, agrarian credit turned into a form of specialized banking, while Anglo-Saxon countries rather tended to rely on personal finance for agrarian credit. Moreover, European countries differed with regard to the organized credit institutions that addressed agriculture (Meinhold 1956): mortgage associations of noblemen (Landschaften) dominated in Prussia and Austria; agrarian cooperatives dominated much of Scandinavia, centralized cooperatives and deposit banks in France, private banks in England, and state banks in Southern Europe and Russia (Blackwell and Kohl 2017). Public and private mortgage banks as well as savings and insurance banks existed in most European countries.

Pioneered by the major Canadian institutionalist Harold Innes and his "staples thesis," other explanations for the development of distinct geographical types of agrarian capitalism focus on the type of resources that build the backbone of an economy's infrastructure. Hence, Innes explains the entire political economy of Canada through its reliance on staple products. Starting with fish and especially beaver fur in the seventeenth century, and changing to wood and wheat in the nineteenth century, these products require a central organization of trade, often in monopoly form, and heavy collective investment in transport. The geography of this transport and trade determined the historical boundaries of Canada, and its specialization has been the international complement to industrializing Europe and the American Northeast (Innis 1956).

While this section has underscored the importance of agrarian topics for the Classics, it at the same time already points to the impact of different agrarian regimes on the institutional development of contemporary capitalist societies. This will be further elaborated in the following section.

2 The long shadow of agrarian history on industrial societies

Looking back to the Classics, it is clear that agrarian relations have been a crucial factor for the development of civiliza-

tions and societies across the globe. But what about the long-term impact of agrarian relations on contemporary market economies? Albert O. Hirschman ([1982] 1986) famously noted that a nation's agrarian legacy either builds *feudal shackles* or *feudal blessings* for the development of modern market economies: feudal institutions from agricultural economies can thus either hinder industrial growth and social order from rising, or they can be one of its enabling conditions. Whatever the direction of influence, history bears strong evidence for a long shadow of agrarian history on the local and national organization of different types of contemporary capitalism.

One of the first works to more systematically acknowledge the long-term impact of agrarian history on contemporary society was Alexander Gerschenkron's *Bread and Democracy in Germany* (1943). According to Gerschenkron, large German farmers known as Junkers built an important political pressure group that enjoyed privileges and protection from the Prussian state. With increasing international competition by the end of the 1870s, domestic grain markets were therefore protected by the state through a new system of tariffs. This marked the starting point of a long era of protectionism and top-down solutions to crises in German agriculture – a situation that eventually spurred a wide-ranging aversion for free market competition and democratic institutions among the Junkers.

In this light, Barrington Moore's seminal comparative analysis further systematized the hypothesis that the agrarian social structure – and in particular the inequality it produced – was the crucial determinant for the evolution of different political regimes in the interwar period (Luebbert 1991; Moore [1966] 1969) as well as different revolutionary dynamics (Skocpol 1979). The focal point of Moore's post-Marxian analysis is the "peasant problem" – i.e., the growing class conflict between the peasantry and the bourgeoisie during the transformation from agrarian to capitalist industrial society. Thus, equal nineteenth-century land distribution with bourgeois revolutions tended to lead to democratic states in the twentieth century (England, United States and southwestern Germany); unequal distribution in urbanized countries with reforms from above, towards fascist states (East Elbian Germany and Japan); and backward agrarian states with central bureaucracy, towards communism (Russia and China). But also, intra-country struggles – between the Rhineland and Prussia or the American South and West – are mainly seen as being driven by agrarian economic conditions of land distribution.[4] The grand thesis of big landowners being systematically opposed to democratic development, however, has been contested in recent years. Albertus (2017) finds empirical support for large labor-dependent landowners supporting authoritarian regimes in a search for the protection of private property. However, labor-dependent landowners in countries such as El Salvador and South Africa turned away from the uncertainties of autocratic rule in support of democratic institutions and the rule of law during the Third Wave of democracy in the 1970s (ibid.).

In addition to this, Macfarlane (1998: 117) explains the absence of the "peasant problem" in England (and to a certain degree in Japan) as a "sheer accident of islandhood" shaping land distribution. In line with Weber, Macfarlane argues that due to the island state's insulated position in the world economy, the threat of an invasion from outside remained rather weak, and therefore interest on the part of the crown in protecting the peasant class for military purposes was low. As a consequence, England maintained a rather feudal and abstract conception of land as "indivisible" under Common law with its private and flexible conception of property that protected landowners from the state, thus facilitating the development of early capitalism on the British Isles. By contrast, emerging nations on the Continent – such as France, Germany, Switzerland, and Italy – saw a constant threat from the outside and retained a strong interest in protecting the peasant class, which resulted in a revival of Roman law with its concrete, divisible conception of land that enabled inheritance among a number of family members, leading to fragmentation and consolidation of absolutist control (Macfarlane 1998: 114).

Finally, several authors have also made reference to agrarian structures in the nineteenth century to explain twentieth-century Central American regimes: commodities such as coffee require a plantation form of exploitation, which in turn created more unequal social and eventually political structures than banana-based economies, whose larger middle class prevented twentieth-century dictatorships from arising (Mahoney 2001; Woodward 1976).

While these works emphasize agrarian effects on the polity, others focused more on politics and policy effects. Historical and electoral geography have thus linked agrarian production regimes with the political orientations of regions. As a classic, André Siegfried "believed that the explanation of western French voting differences was to be found at the level of the village. He hypothesized that such structural factors as the type of soil and vegetation, the degree of population concentration, the mode of land tenure, and the ratio of large, medium, and small farms combined to deter-

mine the extent of peasant dependence on the church and nobility" (Brustein 1988: 20). Building on Siegfried, Brustein identifies three agrarian production regimes according to land tenure, settlement type, farm size, and class composition. While applied specifically to France, the three regimes broadly cover the historical geography of Europe, with a "Mediterranean mode […] typified by market-oriented economic activity, small-owner cultivation or salaried agricultural labor, agglomerated settlement, intense town-countryside ties, a heterogeneous and relatively democratic class structure, and a high proportion of landlord absenteeism" (ibid. 35). By contrast, northeastern France, but also the Rhineland and southern Italy, display commercial activity, cash tenancy, compact settlements and a differentiated class structure; while the Western coast was more subsistent, with sharecropping or tenancy, dispersed settlements and a bipolar class structure. The proposed link to policy orientation in the regions is made as follows:

"The more a region is marked by these elements – subsistence economic activity; medium- to large-scale tenancy, sharecropping, or owner cultivation; a dispersed population; low town-countryside association; and the presence of social elites – the greater should be the tendency for cultivators in that region to oppose state subsidization, defense of small farms, church-state separation, progressive taxation, land redistribution, curtailment of monopolistic practices, and rural democracy" (ibid. 104-5).

Next to policy orientation, interest group formation is an important part of politics. Puhle (1975) traces the general origins of state interventionism back to the agrarian movements of the nineteenth century in Germany and the United States. Whereas from early on, large German farmers were established as a political pressure group in favor of protectionist policies in the Prussian state that eventually lead to the support of authoritarian solutions, American farmers showed a rather weak degree of collective organization, leading to a much stronger degree of market orientation and democratic values. Despite these differences, agrarian history also makes clear that with the increasing industrialization of agriculture, even the most liberal and democratic states eventually developed toward one or another form of *organized capitalism* (ibid.15; also see (Berding et al. 1974)) – i.e., a consolidated market economy in which agriculture and different sectors of the economy are increasingly entrenched with the regulating authority of the state, as the New Deal in the US or the late establishment of the Milk Marketing Board in England have shown (Medick 1974; Winter 1984).

However, the idea that large farmers such as the German Junkers are the driving force behind agricultural support must be treated with caution, as Koning (1994) has argued. While it is certainly true that large farmers called for agricultural support as production costs outstripped profits, their political influence was rather weak. Thus, only in coalition with the re-emerging class of more cost-efficient family farmers – who were also suffering from overproduction and low prices – and other non-agrarian interest groups such as industrial capitalists who feared domestic market instability, was support strong enough to convince policy-makers of the need for agricultural support. Moreover, the degree and endurance of state support over time depends greatly on the presence or absence of agrarian parties in parliament (Arter 2001). Historically, this tended to be the case in party systems without a religious cleavage line next to the standard work-capital cleavage line – for example, in Northern and Eastern European countries. In the former, they have also been cited as the harbinger of the comprehensive welfare states, as small peasants and social democracy could align to pass all-embracing welfare laws starting in the 1920s and 30s.

Furthermore in a comparative case study of the United States, Japan, and France, Sheingate (2003) shows that the rise of "agrarian welfare states" in support of protectionist policies was highly contingent on how agrarian interest groups could lobby for their interests depending on the specific political institutional environment. Thus, while farmers in Japan and France managed to establish themselves as resilient political pressure groups in the conservative parties, the development of European-style corporatism was hindered in the United States from the beginning due to pluralist integration of different interest groups across political parties and comparatively strong government institutions that later facilitated retrenchment from agricultural support. By contrast, agrarian interest groups still enjoy strong political representation in Japan and France, making retrenchment of support difficult for political parties. Instead, agrarian interest groups remain powerful and shape states' positions on international trade agreements. This is also true for the European Union and Germany, where agrarian unions build powerful political coalitions that pressure political parties to support protectionism on domestic and supranational levels (Rieger 1994).

The agrarian roots of state interventionism have not only lead to country-specific forms of economic organization in agriculture, but they have also strongly influenced the general development of economic organization – in particular,

the development of welfare regimes. Since agriculture still played an important role in most industrializing economies, the development of modern welfare states was highly contingent on "left-green coalitions" between rural farmers and urban wage laborers: "Thus, the origins of the Keynesian full-employment commitment and the social democratic welfare-state edifice have been traced to the capacity of (variably) strong working-class movements to forge a political alliance with farmer organizations; additionally, it is arguable that sustained social democracy has come to depend on the formation of a new-working-class-white-collar coalition" (Esping-Andersen 1990: 24). Farmers' parties are a particularity of the Nordic party systems, but have also been prominent in Eastern Europe. By contrast, in countries such as Italy and Germany, a high demand for a rural workforce remained, making farmers more likely to endure long-lasting relations with conservative forces in favor of corporatist arrangements. In the United States, a similar left-green coalition led to the New Deal, although further developments towards a Nordic style welfare state were blocked by the Southern states, which were highly dependent on the rural workforce (Esping-Andersen 1990: 36).

In this light, Monica Prasad (2012) has shown how agrarian movements have hindered the development of a European-style welfare state in the United States. Accordingly, farmers were key actors in shaping US tax law as a reaction to the problem of overproduction resulting from an increasingly productive American agricultural sector. While European farmers were pressuring policy-makers toward protectionist policies against American dominance, American farmers were not only culturally in favor of market competition, agricultural industrialization and economies of scale, but they were also supportive of demand-side policies such as progressive taxation to stimulate domestic consumption of agricultural goods. As a consequence of this demand-side lobbying by farmers' unions, the United States is the only developed capitalist nation without a national sales tax (Prasad 2012: 99-147). Thus, Prasad's historical analysis not only does away with the common conception of anti-state interventionism in the US, but it also explains why the US never developed a European-style welfare state based on regressive taxation and redistribution. Agrarian interventions thus took place in one of the key liberal market economies, which leaves the impression that an agrarian comparison of capitalisms is less one of liberal versus coordinated economies, but one of different intervention styles, as the next section will make clear.

3 Varieties of contemporary agrarian capitalism

Though written in a context in which the importance of agriculture is strongly declining, there is still some more contemporary literature – often single-case studies of specific agricultural regimes – with at least implicit comparative angles. Thus, approaches organize comparisons around (i) the vision of agriculture, (ii) the type of actors that dominate the agricultural policy, and (iii) the research and innovation system in agriculture.

The first dimension of comparison extracted from the literature is the cultural vision of agriculture: the general ideal towards which agricultural policy is oriented (Morgan, Marsden, and Murdoch 2006). In the US, this ideal is very well characterized by the title of a book by the MIT historian Debora Fitzgerald (2003): *Every Farm a Factory*. Although the industrialization of agriculture was much more difficult than the industrialization of handicrafts or housework (whole generations of rural sociologists dealt with this problem (Mann and Dickinson 1978; Murdoch 1994)), the ideal of an efficient and large-scale agriculture dominated agricultural policy for decades (see also Striffler 2005). In the US context, the industrialization of agriculture always meant increasing labor productivity (Wright 2012) rather than the European drive for increasing land productivity. This is true because agricultural production in the US was traditionally characterized by a shortage of labor, but land existed in abundance. As a reaction to this shortage, the major innovations in US agriculture, such as hybrid seed, were labor-saving innovations (Rhoten and Powell 2010).

In Central Europe, the leading vision of agriculture has been very different. In the last few years the term "multifunctional agriculture" has emerged to describe this different orientation (Morgan, Marsden, and Murdoch 2006). Agriculture is not only seen as a producer of food; it is also seen as responsible for the protection of the environment, as a factor for tourism, as a protector of the *Kulturlandschaft*. Especially in the last 30 years, the transformation of agriculture into a more sustainable endeavor has become an important political project. However, the different perspective on agriculture that exists in the EU is not based only on cultural reasons. The challenge in the EU has always been to increase, but also to secure, land productivity. While in the US, farmers came from a tradition in which problems with land productivity were solved by going west, in the EU there was no spare land which the farmers could cultivate. Therefore, the

major challenge in the EU has been to increase and secure land productivity.

This difference is very well illustrated by the following numbers. The monetary total of agricultural production in the EU and the US is almost the same. In the EU, the total production (farm gate value) is 190 billion US$; in the US, the produced value is only slightly higher, at around 197 billion US$ (Morgan, Marsden, and Murdoch 2006). However, the way agricultural production is managed differs fundamentally. The EU only has one-third of the amount of farmland found in the US. The size of the average farm in the US is 207 hectares, while in the EU it is only 18 hectares. Correspondingly, in the US, agricultural production is managed by 2 million farms, while in the EU, over 7 million farms produce almost the same output (ibid.)

A second line of comparison is among the types of actors who dominate agricultural policy. While in Germany the important transformations in agriculture, such as industrialization, were mainly driven by consensus-oriented private organizations, the American industrialization of agriculture was much more centrally organized and planned. Its strongly centralized political management of agriculture originates in the political reaction to the challenges of the Great Depression – the New Deal. Its interventions replaced the federal agricultural subsidies and other political measurements by the federal states and resulted in a centralized agricultural policy with the state as the dominate player (Puhle 1975). The political goal of these interventions was, first and foremost, domestic food security. In the context of the Cold War, however, another goal was added: to become the "bread basket of the world." Both aims were achieved quite successfully: after 1940, the US became by far the biggest wheat exporter, and a large range of countries (including the Soviet Union) became dependent on US wheat imports (Perkins 1997; Abel 1967). This goal was achieved by the radical industrialization and rationalization of agricultural production. In line with the dismantling of the public sector in the context of neoliberal reforms (Slaughter and Rhoades 1996), the meaning of great political visions gave way to a the political enforcement of market intuitions. However, the orientation of production towards global commodity markets remained.

The agricultural policy in Germany, on the other hand, was shaped by private, consensus-oriented actors and entailed a more "gentle" and decentralized version of agricultural modernization. One of the key actors in German agricultural policy was and still is the *Bauernverband* (farmers' union) (Heinze and Mayntz 1992). In line with other consensus-oriented institutions in coordinated economies, the Bauernverband is characterized by an ongoing but never fully resolved conflict between opposing interests. Historically the Bauernverband was an advocacy group of the Junkers, which entailed that the political orientation of the Bauernverband was deeply shaped by the interests of the large and wealthy farmers from the northeast. The interests of the peasants and smallholders in southern Germany, on the other hand, were systematically neglected. As a consequence, the Bauernverband never enforced a strong version of industrialization. The protection of the unity of all farmers and the prevention of rural unrest were much more important goals (Uekötter 2012). Today, 90 percent of all farmers are members of the Bauernverband, and the agricultural policy on many levels is strongly influenced by this organization (Heinze et al. 2003).

The third dimension of comparison, we suggest, is the system of agricultural innovations. Due to the special role of food supply for domestic security, the field of agricultural research is traditionally characterized by strong public institutions (Barlösius 2010; Lundgreen, Horn, and Krohn 1986). The design of these institutions, however, varies in the different nation-states. In the US, the central institutions of the agricultural innovation system are the land-grant colleges. These colleges and their agricultural extension services were pivotal for the industrialization of agriculture as well as for technology development in the Green Revolution and in later decades (Perkins 1997). Traditionally, these colleges did research in important but commercially unattractive fields and supported the local farmers through technology and knowledge transfer. Influenced by the neoliberal agenda, however, the purpose of these colleges changed dramatically. Now the goal of the land-grant system was no longer to supply innovations for the local farmers, but to engage in global knowledge competition (Glenna, Shortall, and Brandl 2015; Rhoten and Powell 2010). Despite the fundamental reshaping of the land-grant system, the general orientation towards radical or science-based innovations (e.g. transgenic plants) persisted.

While in the US, the establishment of research institutions in the field of agriculture was driven by state actors, the scientification of agriculture in Germany was strongly promoted by private actors, and only later by the public sector (Wieland 2004). As a result, the German agricultural innovation system is characterized by the long-term collaboration of scientists from the private and the public sectors as well as the collaboration of medium-sized companies. In contrast to the

American case, the collaboration of private and public actors does not result in the domination of one sector over the other. This institutional setting allows for a very different type of innovation – namely, innovations which are more strongly based on implicit knowledge. This type of innovation is supported by the corporative institutions of the German economy (Brandl and Glenna 2016).

Next to these comparative approaches, which are applied only to the industrialized world, there is a broad range of theoretical concepts and empirical studies that address the historical progression of different food regimes and also include the Global South, for which agricultural economies are even more important.**5** The concept of food regimes is one of the earliest and best-known theoretical approaches to linking agriculture and the development of capitalism. The term "food regimes" originates in the work of the historical sociologists Harriet Friedman and Phil McMichael (1989), whose intention was to explore "the role of agriculture in the development of the capitalist world economy, and its trajectory in the state system" (ibid. 93). This objective emerged in the context of dramatic upheavals in the late 1980s, globalization, the end of the Cold War, as well as the beginning process of deregulation in the agricultural sector. Driven by the insecurities that arose from these transformations, the goal of many sociological scholars was to understand and classify these upheavals in a broader political-economic perspective.

The concept of food regimes was inspired by two theoretical perspectives: the world system approach of Immanuel Wallerstein (1974) and the concepts of the French Regulation School (Aglietta 2000). In line with the findings of the regulation approach, the scholars of food regimes identified three regime types: first, the British-centered regime (1870s–1930s), which was characterized by the import of tropical commodities from the colonies and basic grains and livestock from the settler states (USA, Canada, Australia). In the second regime, the US-centered food regime (1950s–1970s), food became a strategic factor in foreign policy. This was especially true for the US, which used food exports as a "weapon" in the Cold War and as an instrument to maintain hegemonic status. The basis for expansive food production in this regime was the Fordist restructuring of agriculture – in other words, the establishment of an industrial-agricultural complex. The third regime, the corporate food regime (1980s–2000s), is characterized by the transnationalization of food production, a global division of labor, and the decline of national agricultural regulations (McMichael 2013).

The rural sociology of the 1990s was deeply shaped by the analytical approach of food regimes. Sociologists applied this framework to describe the Fordist restructuring of agriculture as well as the looming signs of the neoliberal project (Kenney et al. 1989). In the last 30 years, the concept of food regimes was further developed and adapted by rural sociologists as well as political geographers. In the more recent works, food regime analyses deal with topics such as the neoliberal restructuring of agriculture and the political goal of food security in the Global South (McMichael 2006; Patel 2013).

The Global South has not only been treated as a monolithic bloc, but has been differentiated according to class relations, agrarian revolutions, and international trade in Marx-inspired studies in the 1970s. In his general analysis of rural class relations and property regimes, Arthur Stinchcombe thus divides countries into manorial systems, plantation systems, those predominated by family-sized tenure, smallholders, and capitalist ranches with wage labor. Building on Stinchcombe, Paige distinguished different agrarian regimes for developing countries' export regimes (tobacco, sugar, coffee): plantation systems with exploitative labor relations and smallholdings, both associated with reform-like modes of change, versus the sharecropping and migrant labor system and the traditional hacienda system, associated with revolt or revolutionary modes of change (Paige 1978).

Conclusion: toward a comparative understanding of agrarian capitalism

There is no established typology for studying the varieties of agrarian capitalism (VoAC), but as our cursory review since the Classics' time has shown, agricultural dimensions have been far from absent in comparative approaches within sociology and political economy. We nevertheless believe that a more systematic comparative approach is needed in order to illuminate the historical origins and path-dependencies of different agrarian regimes in different domains of modern society. In addition, this would result in a better understanding of the institutional context of conflicts and coping strategies in rural economies when confronted with the uncertainties of increasingly globalized and financialized markets for agrarian goods, technoscientific development, overproduction, and environmental pollution. Based on our collection of comparative approaches to agriculture, we therefore conclude by sketching some of the lines along which comparative typologies could be constructed as guiding tools for a new a comparative analysis of agrarian capitalism.

For such a comparative analysis to make sense, the precise historical time period needs to be taken into account, as we have seen that agriculture before the 1880s was different from the interwar period – itself being different from the Fordist and post-1970 world "food regime" (Friedman and McMichael 1989). In addition to time, the spatial unit of comparison can also be variable for an agrarian typology: for some crop-growing conditions, local soil and climate are crucial, with countries being split up into opposing regimes. The agrarian historical geography of Europe shows many country-independent boundaries (Pounds 1990). In comparative agriculture in general, institutional approaches are challenged by geographic, climatic, or factor-endowment determinisms. For other matters, in turn, supranational entities such as the EU or trade regimes can be the relevant political units. Another unit of comparison could be sectors within agriculture – for instance, crop vs. livestock-based sectors or comparisons of sectors organized around different commodities. Finally, the comparison can take place on different levels: while most typologies are grouped around an institutional comparison, it can also be ideational, economic-structural, or political (policy, politics).

A first comparative dimension drawn upon since Weber is the actual **organization of the farm**, where ideal-typically, one can distinguish the small subsistence farm from the medium-sized family farm and the large corporative farm – a distinction often correlating with the kind of labor regime: family vs. wage or slave labor. Within the wage labor regime, more or less coordinated forms of wage-setting are possible. The farm size can also be approximated by land, and land inequality itself has often been linked with correspondingly unequal social and political structures, with unequal agrarian regimes being less democratic. On the ideational level, therefore, the family farm has traditionally been linked to an ideal of political order – but also to the individual virtues of good citizens and soldiers – which came to a certain clash with the farm-factory ideal in the postwar period.

A second comparative dimension regards the **trade-openness** of countries: if a country followed a path that let its agriculture compete when world markets created pressure, this brought it into an entirely different country group – in terms of agrarian politics, prices, and economic structure – than if world market production was embraced as solution to internal overproduction. This dimension is closely tied to the form in which arable land was used, with the distinction of mass-produced staple goods such as wheat or soya and the specialized production of dairy. These different politics were, in turn, historically important in shaping a range of features in state formation, from welfare state characteristics to tax regimes. But agriculture, at least historically, was also at the crossroads of two other policy fields that impacted on it – namely, defense and population.

A third dimension, echoing the VoC approach, is **finance**. At least historically, countries differ with regard to the financial institutions through which long-term capital provided (or not) for the expansion of an economizing agriculture. Rough cleavage lines run between countries relying on personal finance, those relying on cooperative deposit finance, and those that rely on either bond sales on capital markets or outright state institutions. The relation of this financial dimension – including the kind of agrarian insurance regime – with other, possibly complementary, institutional spheres is, however, largely unexplored. Similarly, the agrarian vocational training regime has not been put into a comparative perspective.

A fourth dimension regards different **risk management** regimes: agricultural production faces both natural risks of crop shortfall and the human-made risk of unexpectedly low prices after harvest. As most agricultural production functions have a time lag between the decision to invest and the moment of return, there is a risk of not meeting the expected prices. Both types of risk can be addressed by different institutional arrangements of risk management, ranging from village solidarity to farmers' cooperatives to modern insurance and commodity futures trading (Levy 2012).

A fifth dimension regards different **knowledge and innovation** regimes: agrarian capitalism relies heavily on scientific and technological innovations, which are institutionalized and regulated in different country-specific ways. These include the role of the state, farmers' organizations, agricultural schools, the design of intellectual property rights, and their knowledge transfer with entrepreneurs and investors.

Intimately tied to the knowledge and innovation regime is a sixth dimension, the **vocational system**. As in industrial sectors, the vocational system is crucial for recruitment and education and secures the intra-generational materialization of knowledge and innovation regimes within agricultural production. Variations occur in the institutionalization of agricultural education (practice vs. theory; on-farm training vs. school; state-organized vs. farm-organized), work ethos, and degrees of professionalization and specialization, respectively.

While these six dimensions lay out the analytical tools for the study of VoAC, a broader research agenda should investigate the systematic ties between VoAC and the established welfare and CPE typologies. In a cross-sectional perspective, it should ask, for example, whether there are functional complementarities between similar institutional domains across sectors. In longitudinal perspective, it should ask whether they underlie common tendencies such as industrialization or liberalization or whether agriculture follows its own sectoral logics. In historical development, it might have shared common causes with the logic of industrialism, and there were many mutual influences, spillovers, and institutional exchanges. The comparative study of VoAC should not lose sight of possible commonalities and processes of convergence, such as growing productivity, urbanization, and technological change. But below this surface – as this text has tried to lay bare – there is considerable variance in how countries and regions go about institutionalizing a still vital sphere of modern economies.

Sebastian Kohl *is a postdoctoral researcher at Uppsala University and the Max Planck Institute for the Study of Societies. His research interests include economic sociology, comparative-historical sociology and the political economy of housing and private insurances.*

Alexander Dobeson *is a postdoctoral researcher at the Department of Sociology at Uppsala University. His research interests include economic sociology and science and technology studies with particular emphasis on agrarian capitalism and overproduction.*

Barbara Brandl *is a postdoctoral researcher at the University of Trier. Her research interests include the political economy of agriculture and technological innovation as well as the sociology of finance with a particular focus on fintech companies.*

Endnotes

1Ironically, VoC typologized manufacturing economies just at the time of their decline in the West, while theoretical frameworks for service economies are neglected similarly to agrarian ones.

2By varieties of capitalism, we refer to the broader comparative analysis of capitalist phenomena, not only Hall and Soskice's key approach (Hall and Soskice 2001).

3For a critical revision of Marx, see Overton (1996), who also highlights the interrelatedness of farming practices, social relations and institutions for agricultural modernization.

4See modern works showing the long-term impact of early land inequality on growth, human capital and democratic development (Baten and Juif 2014).

5By contrast, the cited comparative research has rather a bias against the Global South.

References

Abel, Wilhelm. 1967. *Agrarpolitik.* Göttingen: Vandenhoeck & Ruprecht.

Aglietta, Michel. 2000. *A theory of capitalist regulation: The US experience.* London, New York: Verso.

Albertus, Michael. 2017. Landowners and Democracy: The Social Origins of Democracy Reconsidered. In: *World Politics 69(2),* 233-76.

Arter, David. 2001. *From Farmyard to City Square? The Electoral Adaptation of the Nordic Agrarian Parties.* London: Ashgate Pub Limited.

Barlösius, Eva. 2010. Ressortforschung. In: Dagmar Simon/Andreas Knie/Stefan Hornbostel, *Handbuch Wissenschaftspolitik*, 377-89. Berlin: Springer.

Baten, Joerg/Dácil Juif. 2014. A story of large landowners and math skills: Inequality and human capital formation in long-run development, 1820–2000. In: *Journal of Comparative Economics 42(2)*, 375-401.

Berding, Helmut/Jürgen Kocka/Hans-Christoph Schröder/Hans-Ulrich Wehler, eds, 1974. *Organisierter Kapitalismus. Voraussetzungen und Anfänge.* Göttingen: Vandenhoeck & Ruprecht.

Bergmann, Klaus. 1970. *Agrarromantik und Großstadtfeinschaft.* Meisenheim am Glan: Verlag Anton Hain.

Blackwell, Timothy/Sebastian Kohl. 2017. *Varieties of Housing Finance in Historical Perspective. The Impact of Mortgage Finance Systems on Urban Structures and Homeownership.* MPIfG Discussion Paper 2.

Brandl, Barbara/Leland L. Glenna. 2016. Intellectual Property and Agricultural Science and Innovation in Germany and the United States. In: *Science, Technology, and Human Values, online first.*

Brustein, William. 1988. *The social origins of political regionalism: France, 1849-1981*. Volume 17. University of California Press.

Esping-Andersen, Gøsta. 1990. *The Three Worlds of Welfare Capitalism.* Cambridge: Polity Press.

EU-Commission. 2013. *The common agricultural policy (CAP) and agriculture in Europe.* Brussels.

Federico, Giovanni. 2005. *Feeding the world: an economic history of agriculture, 1800-2000.* Princeton University Press.

Fitzgerald, Deborah Kay. 2003. *Every farm a factory: The industrial ideal in American agriculture.* New Haven: Yale University Press.

Friedman, Harriet/Philip McMichael. 1989. Agriculture and the state system: The rise and decline of national agricultures, 1870 to the present. In: *Sociologia ruralis 29(2)*: 93-117.

Glenna, Leland L./Sally Shortall/Barbara Brandl. 2015. Neoliberalism, the university, public goods and agricultural innovation. In: *Sociologia Ruralis 55(4)*: 438-59.

Hall, Peter/David Soskice. 2001. *Varieties of Capitalism, The Institutional Foundations of Comparative Advantages.* Oxford: Oxford University Press.

Heinze, Rolf G.,/Renate Mayntz. 1992. *Verbandspolitik zwischen Partikularinteressen und Gemeinwohl: Der Deutsche Bauernverband.* Verlag Bertelsmann Stiftung Gütersloh.

Heinze, Rolf G./Dietrich Thränhardt/Oskar Anweiler/Joachim Raschke/Christoph Hohlfeld/Bernd Guggenberger/Manfred G Schmidt/Wichard Woyke/Eckhard Jesse/Ursula Minch. 2003. Bauernverband. In: Uwe Andersen/Wichard Woyke, eds, *Handwörterbuch des politischen Systems der Bundesrepublik Deutschland.* Springer VS.

Hirschman, Albert O. (1982) 1986. *Rival Views of Market Society and Other Recent Essays.* New York: Viking.

Innis, Harold Adams. 1956. *The Fur Trade in Canada, an Introduction to Canadian Economic History.* Revised Edition. By Harold A. Innis.[Foreword by RM MacIver. Preface to Revised Edition by Mary Q. Innis.]. Toronto: University of Toronto Press.

Kenney, Martin/Linda M Lobao/James Curry/W. Richard Goe. 1989. Midwestern agriculture in US Fordism: From the new deal to economic restructuring. In: *Sociologia Ruralis 29(2)*: 131-48.

Koning, Niek. 1994. *The Failure of Agrarian Capitalism. Agrarian politics in the United Kingdom, Germany, the Netherlands and the USA.* London: Routledge.

Lains, Pedro/Vicente Pinilla. 2008. Introduction. In: Pedro Lains/Vicente Pinilla, eds, *Agriculture and economic development in Europe since 1870*, 1-24. London: Routledge.

Levy, Jonathan. 2012. *Freaks of fortune: The emerging world of capitalism and risk in America.* Cambridge, Massachusetts: Harvard University Press.

Luebbert, Gregory M. 1991. *Liberalism, Fascism, or Social Democracy. Social Classes and the Political Origins of Regimes in Interwar Europe.* Oxford: Oxford University Press.

Lundgreen, Peter/Bernd Horn/Wolfgang Krohn. 1986. *Staatliche Forschung in Deutschland 1870-1980.* Frankfurt a.M.: Campus.

Macfarlane, A. 1998. The mystery of property: inheritance and industrialization in England and Japan' in Property relations. Renewing the anthropological tradition. In: C.M. Hann, ed., *Property relations. Renewing the anthropological tradition, 104-23.* Cambridge: Cambridge University Press.

Mahoney, James. 2001. *The Legacies of Liberalism. Path Dependence and Political Regimes in Central America.* Baltimore/London: The Johns Hopkins University Press.

Mann, Susan A./James M Dickinson. 1978. Obstacles to the development of a capitalist agriculture. In: *The Journal of Peasant Studies 5(4)*: 466-81.

McMichael, Philip. 2006. Peasant prospects in the neoliberal age. In: *New Political Economy 11(3)*: 407-18.

McMichael, Philip. 2013. *Food regimes and agrarian questions. Agrarian Change and Peasant Studies Series.* Winnipeg: Fernwood Publishing.

Medick, Hans. 1974. Anfänge und Voraussetzungen des Organisierten Kapitalismus in Großbritannien 1873-1914. In: Helmut Berding/Jürgen Kocka/Hans-Christoph Schröder/Hans-Ulrich Wehler, eds, *Organisierter Kapitalismus. Voraussetzungen und Anfänge, 58-83.* Göttingen: Vandehoeck und Ruprecht.

Meinhold, Wilhelm. 1956. Agrarkredit. In: Erwin v. Beckerath/Hermann Bente/Carl Brinkmann/Erich Gutenberg/Gottfried Haberler/Horst Jecht/Walter Adolf Jöhr/Friedrich Lütge/Andreas Predöhl/Reinhard Schaeder/Walter Schmidt-Rimpler/Werner Weber/Leopold von Wiese, eds, *Handwörterbuch der Sozialwissenschaften*, 59-66. Stuttgart/Tübingen/Göttingen: Gustav Fischer/J.C.B. Mohr/Vandenhoeck & Ruprecht.

Mommsen, Wolfgang J. 2005. *From Agrarian Capitalism to the 'Spirit' of Modern Capitalism: Max Weber's Approaches to the Protestant Ethic.* Max Weber Studies 5.2/6.1 (Max Weber and the Spirit of Modern Capitalism – 100 Years On), 185-203.

Moore, Barrington. (1966) 1969. *Soziale Ursprünge von Diktatur und Demokratie.* Frankfurt a.M.: Suhrkamp.

Morgan, Kevin/Terry Marsden/Jonathan Murdoch. 2006. The Regulatory World of Agri-Food: Politics, Power and Conventions. In: Kevin Morgan/Terry Marsden/Jonathan Murdoch, eds: *Worlds of Food: Place, Power and Provenance in the Food Chain*, 26-53. Oxford/New York: Oxford University Press.

Murdoch, Jonathan. 1994. Some comments on 'nature'and 'society' in the political economy of food. In: *Review of International Political Economy 3,* 571–77.

Ortiz-Ospina, Esteban/Max Roser. 2016. *International Trade.* Published online at OurWorldInData.org Retrieved from: https://ourworldindata.org/international-trade [Online Resource]

Paige, Jeffrey M. 1978. *Agrarian revolution.* Simon and Schuster.

Patel, Raj. 2013. *Stuffed and Starved: From Farm to Fork the Hidden Battle for the World Food System.* London: Portobello Books Ltd.

Perkins, John H. 1997. *Geopolitics and the green revolution: wheat, genes, and the cold war.* Oxford: Oxford University Press.

Polanyi, Karl. (1944) 2001. *The Great Transformation. The Political and Economic Origins of Our Time.* Boston: Beacon.

Pounds, N.J.G. 1990. *An historical geography of Europe.* Cambridge: Cambridge University Press.

Prasad, Monica. 2012. *The Land of Too Much. American Abundance and the Paradox of Poverty.* Harvard: Harvard University Press.

Puhle, Hans-Jürgen. 1975. *Politische Agrarbewegungen in kapitalistischen Industriegesellschaften. Deutschland, USA und Frankreich im 20. Jahrhundert.* Göttingen: Vandenhoeck & Ruprecht.

Rhoten, Diana R./Walter W Powell. 2010. Public research universities: From land grant to federal grant to patent grant institutions. In: Diana Rhoten and Craig J. Calhoun, eds, *Knowledge matters. The public mission of the research university*, 319-45. New York: Columbia University Press.

Rieger, Elmar. 1994. Herrschaft kraft interessenkonstellation. Agrarverbände in der Europäischen Gemeinschaft und in der Bundesrepublik Deutschland. In: Volker Eichener and Helmut Voelzkow, eds, *Europäische Integration und verbandliche Interessenvermittlung*, 303-19. Marburg: Metropolis.

Roser, Max. 2016. *Agricultural Employment.* Published online at OurWorldInData.org. Retrieved from: https://ourworldindata.org/agricultural-employment .

Schröder, Martin/Helmut Voelzkow. 2016. Varieties of Regulation: How to Combine Sectoral, Regional and National Levels. In: *Regional Studies 50(1)*, published online 2016/01/02: 7-19.

Schüttauf, Alexander Werner. 1956. Agrarmärkte. In: Erwin v. Beckerath, Hermann Bente, Carl Brinkmann, Erich Gutenberg, Gottfried Haberler, Horst Jecht, Walter Adolf Jöhr, Friedrich Lütge, Andreas Predöhl, Reinhard Schaeder, Walter Schmidt-Rimpler, Werner Weber and Leopold v. Wiese, eds, *Handwörterbuch der Sozialwissenschaften*, 67-75. Stuttgart/Tübingen/Göttingen: Gustav Fischer/J.C.B. Mohr/Vandenhoeck & Ruprecht.

Sheingate, Adam D. 2003. *The rise of the agricultural welfare state: institutions and interest group power in the United States, France, and Japan.* Princeton: Princeton University Press.

Skocpol, Theda. 1979. *States and Social Revolutions. A Comparative Analysis of France, Russia, and China.* Cambridge et al.: Cambridge University Press.

Slaughter, Sheila/Gary Rhoades. 1996. The emergence of a competitiveness research and development policy coalition and the commercialization of academic science and technology. In: *Science, Technology and Human Values 21(3),* 303-39.

Sombart, Werner. (1927) 1969. *Der moderne Kapitalismus. Historisch-systematische Darstellung des gesamteuropäischen Wirtschaftlebens von seinen Anfängen bis zur Gegenwart. Dritter Band. Hochkapitalismus.* Berlin: Duncker und Humblot.

Storper, Michael. 1997. *The regional world: territorial development in a global economy.* New York: Guilford Press.

Striffler, Steve. 2005. *Chicken. The Dangerous Transformation of America's Favorite Food.* New Haven Yale University Press.

Thompson, E.P. 1971. The Moral Economy of the English Crowd in the Eighteenth Century. In: *Past and Present 50*: 76-136.

Uekötter, Frank. 2012. *Die Wahrheit ist auf dem Feld: eine Wissensgeschichte der deutschen Landwirtschaft.* Vandenhoeck & Ruprecht.

Volkens, Andrea/Onawa Lacewell/Pola Lehmann/Sven Regel/Henrike Schultze/Annika Werner. 2011. Manifesto Project (MRG/CMP/MARPOR), ed., *The Manifesto Data Collection.* Berlin: Wissenschaftszentrum Berlin für Sozialforschung (WZB).

Wallerstein, Immanuel. 1974. The rise and future demise of the world capitalist system: concepts for comparative analysis. In: *Comparative studies in society and history 16(04)*: 387-415.

Weber, Max. 1919/ 2013. *The Agrarian Sociology of Ancient Civilizations.* London: Verso.

Weber, Max. (1896) 1922. Die sozialen Gründe des Untergangs der antiken Kultur. In: Marianne Weber, ed., *Gesammelte Aufsätze zur Sozial-und Wirtschaftsgeschichte.* Tübingen: Mohr Siebeck.

Wieland, Thomas. 2004. *"Wir beherrschen den pflanzlichen Organismus besser,...": wissenschaftliche Pflanzenzüchtung in Deutschland, 1889-1945.* München: Deutsches Museum.

Winter, Michael. 1984. Corporatism and Agriculture in the U.K.: The Case of the Milk Marketing Board. In: *Sociologia Ruralis XXIV (2)*: 106-19.

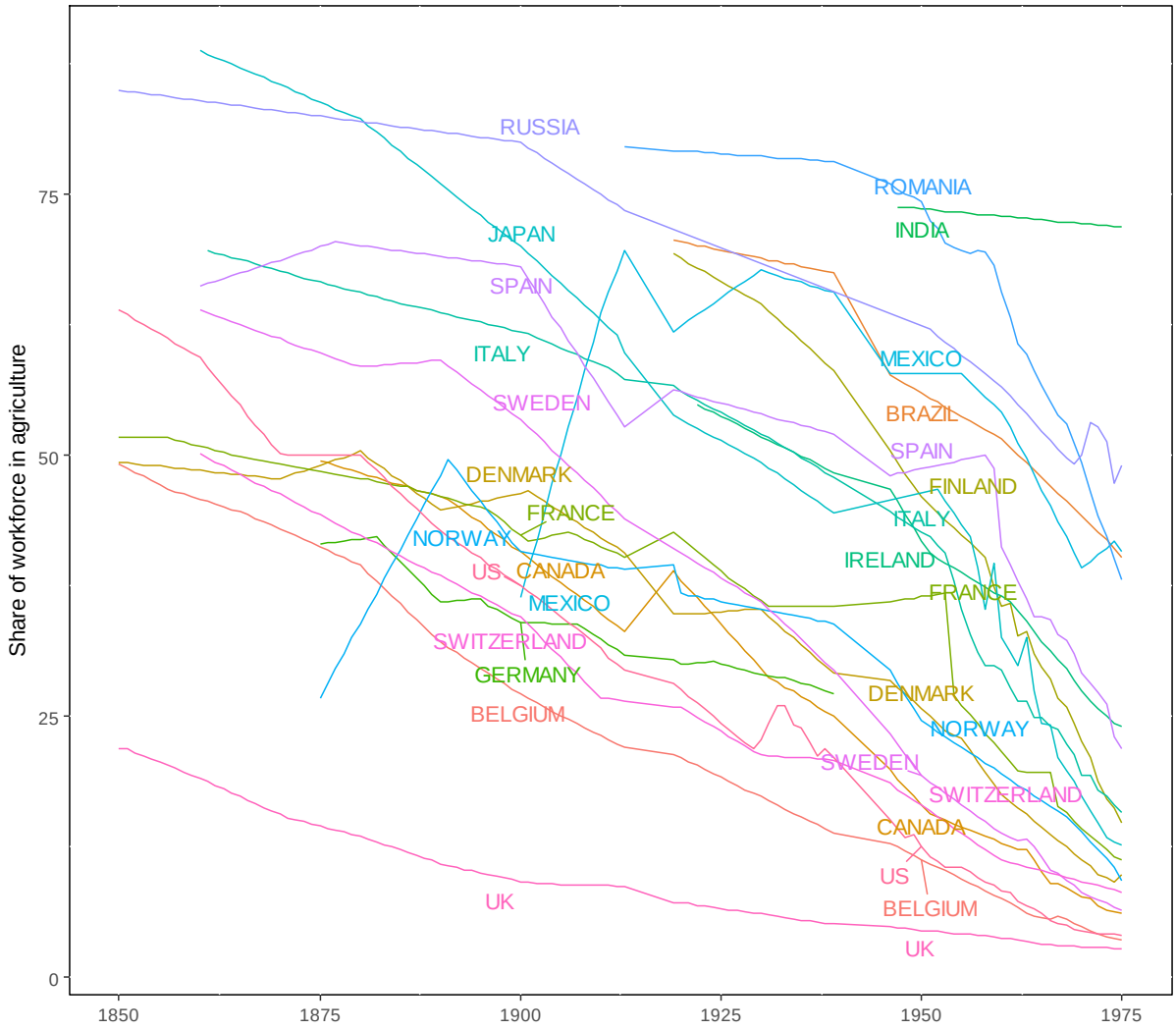
Wittfogel, Karl, 1957. *Oriental Despotism: A Comparative Study of Total Power.* New Haven. Yale University Press.

Woodward, Ralph Lee. 1976. *Central America. A Nation Divided.* New York: Oxford University Press.

Wright, Brian D. 2012. Grand missions of agricultural innovation. In: *Research Policy 41(10)*: 1716-28.

Appendix

Figure 1: Share of agricultural workforce over time



Source: Cross national time series