



Analysis

Foreign trade and early industrialisation in the Habsburg Monarchy and the United Kingdom – Two extremes in comparison

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ABSTRACT

The concept of socio-ecological transitions is used to analyse the quantitative importance of physical imports and exports for the Habsburg Empire and the United Kingdom in the 19th and early 20th centuries. For the Habsburg Empire, a new dataset of foreign trade and social metabolism is presented. For the United Kingdom, the analysis relies on previously published data. Foreign trade volumes increased in both countries in the long run. Total trade volumes were much higher in the United Kingdom throughout the entire time period, on average by around a factor four. Physical factors explaining the disparities in structure and volume of foreign trade in the two countries are differences in (1) the temporal patterns of the socio-ecological transition and (2) domestic resource endowments. In both countries, energy carrying materials, i.e. fossil fuels and biomass, were the dominant resources in physical foreign trade. The analysis focuses on the physically most important material groups: coal, wood and cereals, and discusses the role of imports and exports in relation to domestic resource provision and environmental pressures. Physical foreign trade increased at a faster pace than domestic resource extraction and consumption. The socio-ecological transition was thus accompanied by rising international integration of resource supply.

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1. Introduction

Industrialisation has been described from a materialist perspective as a “socio-ecological transition” (Krausmann et al., 2008b; Fischer-Kowalski and Haberl, 2007), a process of increasing resource use (McNeill, 2000; Krausmann et al., 2009) which is accompanied by a shift from mainly organic materials to increasing amounts of mineral resources. This transition goes along with specific changes in energy use (e.g. Bartoletto and Rubio, 2008; Gales et al., 2007) – again, from mostly organic and renewable to more and more non-renewable energy sources, as well as particular changes in land use (Sieferle et al., 2006; Krausmann, 2001; Kuskova et al., 2008; Erb et al., 2008; Musel, 2009). In many empirical studies on this subject, the role of foreign trade in the transition process is addressed to some extent, usually as proposed within the methodological framework of Material and Energy flow Analysis (see e.g. Schandl et al., 2002; Haberl et al., 2004). Import and export flows are in this framework considered as one of several socio-economic material or energy flows. But the role of foreign trade in the process of the socio-ecological transition as such was not the focal point of these studies.

There is reason to assert that foreign trade did – in various ways – contribute substantially to Europe's industrialisation in the 19th century.

O'Rourke and Williamson (1999) even suggest that globalisation in the 19th century was comparable to the present globalisation process in terms of the speed and extent of increasing global market integration. Economic historians have dealt with the history of foreign trade in Europe in most detail. Studies have traced monetary flows of foreign trade between European countries and the rest of the world (e.g. Bairoch, 1973; Jacks, 2005), others have discussed the (economic) reasons for this development (Olson, 1974; O'Rourke, 1997). The approach of economic history entails the use of (historical) economic statistics and the application of economic concepts, such as price convergence, while the cognitive interest lies in a better understanding of economic interrelationships.

A culturally informed environmental history has dealt with the issue of 19th century foreign trade from a different perspective. Works from this field have been concerned with environmental impacts (or preconditions) of export production in colonised countries (Brannstrom and Gallini, 2004). Most trace the environmental history of a single raw material in a specific producing region, such as Bananas in Central America (Soluri, 2002), sugar in Cuba (Funes Monzote, 2004), rubber in Brazil (Dean, 1987), or ivory in East Africa (Hakansson, 2007). Recently, environmental historians have increasingly taken a more systemic perspective and have attempted to quantify the environmental pressures exerted on the exporting countries by 19th century imports, such as Hornborg (2006) or Pomeranz (2000). The focus of these studies was the United Kingdom, the most important 19th century economic power. Ideas from ecological economics were adopted, in particular the notion of “ecologically

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unequal exchange”: based on world systems theory, studies from this field argue that ecological goods are being exported from the global “South” to the “North” while ecological burdens are being exported (or externalised) in the other direction (Giljum and Eisenmenger, 2004; Hornborg, 1998). The concept of social metabolism has been used successfully for such analyses, particularly for Latin American countries (Perez-Rincon, 2006; Eisenmenger and Giljum, 2007; Muradian and Martinez-Alier, 2001), and has shown that Southern countries tend to be net-exporters of raw materials while Northern countries tend to act as net-importers. This research strand has focused mainly on recent periods, starting from the 1970s.

This article offers a materialist perspective on the environmental history of foreign trade. It applies the framework of material and energy flow analysis to elucidate the role of foreign trade in two very different European economies of the 19th and early 20th centuries, the Habsburg Empire and the United Kingdom. It presents new empirical data on physical foreign trade relations of the Habsburg Empire in 1830–1915, including data on domestic resource consumption, and compares them to previously published data for the United Kingdom in 1850–1915 (Schandl and Schulz, 2002).

The concept of socio-ecological transitions (Fischer-Kowalski and Haberl, 2007; Krausmann et al., 2008a,b) is used to analyse the biophysical features of foreign trade in these two economies during the early stage of industrialisation: how was the socio-ecological transition reflected in the foreign trade relations of the two countries? A detailed analysis of the biophysically most important material categories (coal, wood and cereals) serves to discuss how foreign trade in the Habsburg Empire and the United Kingdom contributed to domestic resource consumption and which international shifts of environmental burdens were associated with foreign trade. With a physical perspective on the history of foreign trade, this article aims to contribute to long-term socio-ecological research (LTSER, see Haberl et al., 2006) and to fill a gap between the quantitative economic history of the 1970s and 80s interested in the (monetary) extent of European foreign trade flows and current research on ecologically unequal exchange, as performed by ecological economics.

The article is organised in the following way: In the next section, the two case studies will be briefly introduced. The materials and methods section presents the data sources and the conversion and aggregation procedures which were undertaken to compile the empirical basis of the analysis. The results of the study will be presented, starting with an overview of total physical foreign trade relations in the two countries. Then, a detailed account of the physically most important material categories will be given: coal and biomass (with an emphasis on wood and cereals). The final section draws some general conclusions on the role of foreign trade in the socio-ecological transition.

2. Apples and Pears – Comparing the Habsburg Empire and the United Kingdom

The Habsburg Empire¹ and the United Kingdom make promising cases for comparing physical foreign trade relations in the early stage of European industrialisation for three reasons: (1) They represent the pioneer and a latecomer of European industrialisation and can be viewed as economies at different stages of the socio-ecological transition. (2) They differ strongly in terms of economic orientation, including their economic foreign trade policies. Finally, (3) they are very similar in terms of their population totals, allowing for a comparison of total numbers. However, the two countries differ in terms

of population density and resource endowments. Comparing these two countries thus illuminates the variations and commonalities of European physical foreign trade during the coal stage of the socio-ecological transition.

The economic differences between the Habsburg Empire and the United Kingdom in the 19th and early 20th centuries, as well as some indicators on resource use are presented in Table 1. The United Kingdom was the most powerful economy in Europe – and the world – throughout large parts of the 19th century, with a per-capita GDP of more than 1500 US Dollars in 1830 and more than 4500 US Dollars by 1910 (Maddison, 2003). The economic power of the United Kingdom went along with distinct features of resource use. In the 19th century, the United Kingdom was home to advanced industrial production, particularly of textiles and iron, and its economy relied on the use of coal much more than continental Europe (see e.g. Allen, 2009): As early as 1830, coal accounted for almost half of the United Kingdom's primary energy use (or Domestic Energy Consumption, DEC, which includes fossil fuels and biomass), and by 1910 it made up over 80% (Krausmann et al., 2008b).

The Habsburg Empire on the other hand was a typical continental European economy in the 19th century (Milward and Saul, 1977). On the edge between centre and periphery, it experienced the shift from handicraft to industrial production comparatively late in the 19th century with large divergences between West and East (Komlos, 1983); in fact, some sectors were dominated by small-scale handicraft until the early 20th century (Good, 1984). In terms of energy use, the Habsburg Empire experienced the shift from biomass to coal only relatively late in the 19th century (Gross, 1971): In 1830, coal contributed less than 1% to total primary energy use, and by 1910, the share was still fairly low at 33% (sources: see Table 2). From an energetic perspective, the Habsburg Empire was thus far behind the United Kingdom on its way along the socio-ecological transition from an agrarian to an industrialised economy. Interestingly, the United Kingdom and the Habsburg Empire had quite similar population totals in the 19th century, see Table 1: increasing from around 24 mio. in 1830 (29 mio. in the Habsburg Empire) to 45 mio. in 1910 (49 mio. in the Habsburg Empire). Given that the Habsburg Empire was roughly twice the area of the United Kingdom, population density was almost two times higher in the United Kingdom, with implications in terms of urbanisation, transport and per-capita land availability.

The two economies differed greatly in terms of their foreign trade relations: the United Kingdom played a unique role in the world economy. Its trade volume surpassed that of any other country of the world throughout much of the 19th century (Bairoch, 1973), especially after the abolition of the Corn Laws which had restricted cereal imports until 1846. In contrast to the continental European countries, its foreign trade relations were dominated by overseas trade, particularly with the United States and India (Bairoch, 1974; Foreman-Peck, 1983). The country's geographic characteristics, an

Table 1
Structural data on the United Kingdom (UK) and the Habsburg Empire (HE)^a.

		UK 1830	UK 1910	HE 1830	HE 1910
Total population	1000 cap	23,814	44,915	28,511	49,066
Total area	km ²	313,183	313,183	667,251	624,865
Population density	cap/km ²	76	143	43	79
Agricultural population	% of total	28	8	71 ^b	52
GDP	intl Geary-Khamis \$/cap	1773	4611	961	2172
Domestic Energy Consumption	GJ/cap/yr	68	148	46	66
Share of biomass in DEC	%	54	19	100	67

^a Sources: see text. Data on GDP were derived from Maddison, 2003. For an estimate of the GDP in the Habsburg Empire, I used a weighted average of the values presented for Austria, Czechoslovakia and Hungary.

^b This value refers to Cisleithania in 1840. In the entire Monarchy in 1830, the share of agricultural population was very likely even higher.

¹ I will use the term “Habsburg Empire” synonymously with “Habsburg Monarchy” and, when I talk about the period after the “Dual Settlement” or “Compromise” in 1867, “Austro-Hungarian Monarchy”. To describe the two parts of the Habsburg Empire, I use the terms “Austrian part of the Monarchy” synonymously with “Cisleithania”, and “Hungarian part of the Monarchy” referring to “Transleithania”.

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