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Abstract

The industrial revolution is mostly seen as a supply side phenomenon. Ever since Gilboy stated that factors of demand may have been equally important, scholars have stressed the importance of investments and technological change. This paper re-considers Gilboy's ideas, using the dataset of the Dutch historical national accounts for the nineteenth century. Using a counterfactual VAR analysis, it is investigated to what extent changes in (determinants of) consumer demand may have affected patterns of industrial development.

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1. Introduction

Already for decades economic historians study the dynamics of the First Industrial Revolution. In trying to understand the strong upsurge in economic growth rates from the late eighteenth century onwards, research strongly stresses the importance of supply factors. Special attention is paid to issues concerning technological change and productivity growth. This one-sided focus on supply side factors is a rather recent phenomenon. Earlier contributions to the debate on industrial growth also paid attention to the role of demand. Above all Gilboy's work should be mentioned. In her pioneering 1932 article she stated that factors of demand as well as supply both played a role of equal importance in bringing about Britain's first industrial revolution.

During the 1970s analyses in terms of demand-led growth lost their popularity. Undoubtedly Joel Mokyr is the strongest spokesman of this neo-classical critique. In a vehement attack on Gilboy's work he asserts that on principal grounds factors of demand cannot explain Britain's industrial growth miracle as the demand thesis in a simple form is based on circular reasoning. Mokyr (1985, p98) states: "In this simple form the demand thesis is based on circular reasoning. A shift *of* the demand curve for manufactured goods can occur only if income rises, the price of nonmanufactured goods, or if a change

in taste occurs. Ruling out the latter for the moment, the change in the demand curve must be caused by a rise in real income and can therefore not serve at the same time as an explanation of it".

Mokyr's view still dominates the debate on the First Industrial Revolution. Most authors agree that supply factors have been instrumental in promoting an acceleration of industrial growth. However, during the 1990s some attempts have been made to rehabilitate explanations focusing on factors of demand (De Vries, 1994; Horrel, 1996). In this paper we will also argue that changes in the level and composition of demand may have had an impact on the dynamics of industrial technological change.

This paper analyses consumer demand in the Netherlands in the period 1800-1913 and asks why and how private consumer expenditure increased in the Netherlands before as well as during the phase of 'modern economic growth'. Until recently we did not have reliable data at our disposal to evaluate Dutch economic development in the nineteenth century properly. But now that the project on the reconstruction of the Dutch Historical National accounts is completed, a proper quantitative analysis of the growth performance of the Netherlands in the period 1800-1913 is feasible. These new data show that the economic growth in the pre-1913 period was remarkably stable (Smits,

Horlings and Van Zanden, 2000; Van Ark, De Jong and Smits, 1999). Already from the early 1820s onwards the economy witnessed growth which, during its early phases, was mainly driven by agriculture and services.

One of the most intriguing results of the national accounts projects is that whereas GDP witnessed a rather stable pattern of growth, underlying time-series on income distribution and the structure of expenditure showed sharp breaking points. Earlier research by Horlings and Smits (1996) has shown that this relationship is far from constant and unequivocal during the nineteenth century**.** In this respect special attention has been paid to the unstable trends of food prices, real wages and the indirect taxes on consumption goods. Until now the relative contributions of these factors on consumer demand have not been charted, the exception being the companion paper to the present one Bonenkamp, Jacobs and Smits (2004). We will analyse by means of an econometric method which impact these several factors had on consumer expenditure. This analysis yields interesting results that may also give a deeper insight into the study of the process of modern economic growth of the Netherlands. For example, it seems that during the first half of the nineteenth century no long-term equilibrium relationship for consumption can be

established, whereas such a relationship can be discerned in the post-1850 period.

The article is structured as follows. Section two gives a brief summary of the economic historical literature on nineteenth century Dutch consumer expenditure. Section three explains the econometric methods, while section four discusses the data on which our analysis is based. In section five we will describe which new light this econometric exercise sheds on the debate of nineteenth century consumption. Section six concludes.

2. Consumption in the nineteenth century: a survey of literature

Most studies on the economic history of the Netherlands in the nineteenth century focus on describing and explaining economic development in general terms (Brugmans, 1961), as well as from a sector perspective (Van Zanden and Van Riel, 2004). Many of these studies pay attention to the timing of the process of industrialisation (Brugmans, 1961; De Jonge, 1968, Griffiths, 1979 and Van Ark *et al*., 1999). Until recently not enough reliable data were available to analyse other aspects of economic development, such as the development of consumer expenditure. The completion of the historical

national accounts database has opened up the possibilities for a more specific analysis. The empirical investigation of private consumer expenditure starts with the work of Horlings and Smits (1996).[1] This section is largely based on their findings.

For the first half of the nineteenth century Horlings and Smits show that consumer expenditure reacts strongly to changes in (primary) food prices. They argue that changes in purchasing power, mostly seen as the most important determinant of consumption growth, were mainly driven by fluctuations of agricultural prices (Horlings and Smits, 1996, pp29-30.). This finding should not come as a surprise as food products constituted the larger part of consumer demand in this early period.

During the first half of the nineteenth century, or to be more precise until midway the 1840s, food products had a share of 60% in total consumption. The continuous increase in consumption in this period (of about 1.7% annually) can be ascribed to rising real wages which were primarily caused by declining food prices (Horlings and Smits, 1996, p22).

[1] For more detailed studies on wages, national wealth and investments, see the other contributions in the NEHA Publication *Economic and social history in the Netherlands* 7 (Amsterdam 1996).

The liberalisation of international trade in the 1840s resulted in a strong growth of agricultural exports. Consequently domestic agricultural prices started to increase, which had an adverse effect on domestic demand. For the first time in decades not domestic demand, but exports became the driving force in the growth process (Horlings and Smits, 1996, p22). The rise of agricultural prices was accelerated even further due to the harvest failures in 1847 and 1854. It is therefore not surprising that on average the growth of total consumer expenditure fell with 0.8% a year.

During the second half of the nineteenth century private consumer expenditure followed a completely different pattern of growth. From 1865 onwards consumer expenditure witnessed sharp increases. In the period 1865-1880 real consumer expenditures increased with an average of 3.1% annually, whereas in the two preceding decades growth figures were as low as 0.9% a year. Horlings and Smits (1996, p27) explain this strong expansion of consumption from the restructuring of the Dutch system of taxation, which resulted in a strong (relative) decline of primary food prices. This enabled households to spend a larger part of their income on luxury food products, clothing and other industrial products. This tendency was strengthened as soon

as nominal wages started to increase due to an increasing scarcity of labour (Vermaas and Burger, 1996).

The increases in consumer demand and the structural changes in the patterns of consumption had an impact on the industrial sector as the rapid demand of domestic demand enabled firms to engage themselves in large-scale production. The removal of scale restrictions enabled investments in "new" steam technologies. In the period 1850-1890 the share of steam engines in total machinery rose from 5% to more than 60% (Van Ark *et al*, 1999, p11). The first phase of modern economic growth, i.e. the acceleration of industrial growth in the 1860s and 1870s, seems to be linked to the rise of domestic demand in this period.

The second phase of modern economic growth in the period 1880-1913 was of an entirely different nature. In the period after 1880 the strong growth of consumption diminished somewhat, whereas investments became the main driving force in economic growth. Even though an average annual increase in consumption of 2.6% is still rather high, this growth rate was 0.5% lower than in the preceding decade. The literature does not explain this fall in the consumption growth rate. A possible explanation may be that in the period 1894-1913 a large part of the investments was aimed at substituting labour for

capital goods (Van Zanden and Van Riel, 2004, pp 270-273). This substitution process resulted in a shift of the relative scarcity of factor inputs, which had its effect on the remuneration of production factors. Under the assumption that labour income was mainly spent on consumption goods and that capital income was saved, a (relative) increase of capital income may explain the decrease in consumption growth. Indeed, Smits (2000, p246) shows that the share of labour income in GNP falls in the period 1895-1913.

The strong increase in investments was strongly related to a rapid growth in world trade. Until about 1890 investments had been aimed at the implementation of the technologies of the first industrial revolution. From the 1890s onwards, however, other forces became important. The development of the Dutch manufacturing sector was strongly based on the technologies of the second industrial revolution, based on macro inventions that were related to the use of electrical power. The production capacity of Dutch industry expanded considerably, which enabled a strong growth of exports. In the period 1890-1913 investments witnessed an average annual growth of 3.3%, against a mere 2.4% growth rate for consumption.

3. Method

Periodisation

This paper adopts the following statistical procedure to distinguish subperiods.[2] We estimate a given model specification for two subsamples splitting the sample at each year. For both subsamples we obtain least squares parameter estimates and the sum of squared residuals (SSR). Plotting the sums of the two SSRs against the year of the split allows us to find a break year at the global minimum of the sum of the SSRs. If the sum of the SSRs also shows local minima, further analysis is necessary to find out whether there is more than one structural break.[3]

An important element is the choice of the model that is used to search for structural breaks. Because we are interested in finding subperiods in consumption we apply a *univariate* model, i.e. a model for a single process series, that is popular in testing time series properties. This so-called

[2] For a more general introduction see e.g. Hansen (2001).
[3] This Chow-type test method only produces an indication for the existence of a break year, which suffices for our purposes in this paper. A rigorous approach requires testing for multiple structural breaks. This step is left for future research. For details see Bai and Perron (1998).

Augmented Dickey Fulller (ADF) equation for process y_t has the following form

$$\Delta y_t = \alpha_1 + \alpha_2 t + \alpha_3 y_{t-1} + \sum_{i=1}^{p} \theta_i \Delta y_{t-i} + \varepsilon_t \quad (1)$$

which says that the first difference of the series under consideration consumption $(\Delta y_t \equiv y_t - y_{t-1})$ depends on a constant (α_1), a deterministic trend ($\alpha_2 t$), the lagged level ($\alpha_3 y_{t-1}$) and lagged endogenous variables ($\sum_{i=1}^{p} \theta_i \Delta y_{t-i}$) to ensure that the error term (ε_t) is white noise .

Unit root tests

We apply the ADF model of Equation (1) to test the time series properties of our data. Parameter α_3 plays an important role in the time series properties test. If α_3 is not significantly smaller than zero, the null hypothesis that the process has a unit root cannot be rejected. In many situations the first difference of the process, Δy_t, is stationary, so y_t has one unit root, which is denoted as y_t ~I(1). If α_3 is significantly smaller than zero, the process y_t is stationary, denoted as y_t ~I(0). We can use the standard *t*-statistic to test the significance of parameter

α_3. However, this statistic does not follow the standard Student *t* distribution under the null hypothesis. Critical values depend on the form in which nuisance variables (constant, trend) enter the equations and are implemented in many econometric software packages including Eviews, the one we use.

Below we also apply the Kwiatkowski, Phillips, Schmidt and Shin (1992) stationarity test. The KPSS tests the null of stationarity against the unit root alternative. For details see e.g. Sturm (1998, Appendix A).

Counterfactual VAR analysis[4]

To test whether demand shocks can play a role in the explanation of the industrial revolution in the Netherlands that took place around the 1860s, we employ the technique of counterfactual VAR analysis (Stock and Watson, 2002). We estimate reduced form VectorAutoregressions (VAR) for consumption and its determinants for the subperiods before and after the structural break and sort out how of the change in the variance of the endogenous variables is due to changes in the VAR coefficients, the propagation mechanism, and how much is due to changes in the innovation covariance matrix, the shocks. The VAR has the form

$$X_{it} = A_i(L)X_{it-1} + u_{it}, \quad \text{var}(u_{it}) = \Omega_i \tag{2}$$

where X_{it} is a vector time series, $A_i(L)$ is a polynomial function of degree *p* in the lag operator *L*, $A_i(L) = A_{i1}L + A_{i2}L + \ldots A_{ip}L$ and the subscript *i* denotes the first and the second subsample. Constant terms are included in the estimations but omitted for convenience. The counterfactual variance of X_{it} can be calculated from the moving average representation of the VAR of Equation (2)

$$X_{it} = (I - A_i(L))^{-1} u_{it} \equiv B_i(L)u_{it},$$

since $\text{var}(X_{it}) = B_i(L)\Omega_i B_i(L)'$. By combining the parameter matrices $B_i(L)$ and the innovation variance matrix Ω_i for the different subperiods, we can calculate the standard deviation of X_t in the first period taking the parameters matrices $B_1(L)$ and the innovation variance matrix Ω_1 and its counterfactual value that would have occurred had the lag dynamics of the first subperiod been those of the first subperiod $B_1(L)$ and the error covariance been that of the second period Ω_2.

[4] We thank Robert Inklaar for this lead.

4. Data

All but one of the time series that are used in this article to analyze consumption in the Netherlands in the nineteenth century are obtained from the system of national accounts of Smits *et al.* (2000). The interest rate series comes from De Nederlandsche Bank (Van de Poll, 1996). Figure 1 shows our series .

[Figure 1 about here]

The upper left panel of Figure 1 shows private consumption, which consists of *nutrients* (potatoes, beer, butter, bread, distilled water, cheese, coffee, milk, rice, sugar, tobacco, tea, horticulture products, meat, wine, salt, and other nutrients), *industrial products* (fuel, clothing, and other industrial goods) and *services* (rents, domestic services, education, communication, transport, and other services).

Consumption followed a rather stable pattern of growth during the nineteenth century, although a distinct acceleration of growth rates can be discerned in the second half of the century. Consumption increased at an

annual rate of 1.4% a year 1850, against an average annual growth rate of 2.6% in the period 1850-1913.

Real wage developments more or less followed this pattern. The upper right panel of Figure 1 depicts the real wage series. In the first half of the nineteenth century real wages increased at 1.3% annually, against 2.8% for the later period. Compared to the growth of consumption, especially in the first half of the nineteenth century the wage series are more volatile. This volatility of real wages can be explained from the extreme fluctuations in food prices. Food prices fluctuated heavily due to bad harvests.

The the middle left panel of Figure 1 shows the share of excises in total private expenditure. This ratio gives important information about the tax pressure on consumption goods. First of all, the increase in the tax ratio in the period 1830-1850 should be noted. This increase is related to the revision of the law on taxation in 1831 as a result of which the taxes on primary food products doubled. After the Secession of the Southern Netherlands (present-day Belgium) in 1830, the government was in desperate need for revenues, especially because the tax income in the South—notwithstanding its lower income level—was relatively high. Since this tax income was lost after the Secession, the Dutch consumers had to pay the price for this loss of

government income in the form of higher indirect taxes on primary food products. In the period 1850-1870 this tax burden decreased substantially from a level of 6% of total consumer expenditure to a much lower figure of 3% in 1872. This restructuring of the system of taxation was made possible by the strong influx of income from the Dutch East Indies after the implementation of a system of forced cultivation in the 1840s. The relative rise of taxes in the period 1870-1885 was caused by the slowdown of economic development as a result of the international agrarian depression.

The middle right panel of Figure 1 shows the development of the interest rate. The large fluctuations in this series indicate how vulnerable the 'premodern' economic system was to external shocks. With the exception of the 1860s, the rate of interest has decreased until the beginning of the twentieth century. This long-term decline is probably caused by the capital abundance that characterised the Dutch economy in this period. After 1900 interest rates started to rise due to the strong growth in investments.

Unemployment rates (the lower left panel) witnessed a strong growth until 1855. From the mid 1850s onwards levels of unemployment steadily declined. During the 1880s unemployment showed an increase again, but

without reaching the record-high level of 1855. From the late 1880s onwards unemployment again fell due to the strong upsurge of the world economy.

The lower right panel of Figure 1 shows the development of food prices. This series represents a weighted average of potatoes and bread. Abstracting from strong annual fluctuations, primary food prices showed an increase until midway the nineteenth century. After the Crimean War (1853-1855) these prices sharply fell until about 1865. Apart from a moderate rise in the following two decades, food prices continued to decline in the period after 1880.

5. Results

Periodisation

Visual inspection of the consumption series in the upper left panel of Figure 1 already suggests the existence of subperiods. Our statistical method confirms this conclusion. Figure 2 shows the total sum of squares as a function of the break year, which is obtained with Equation (1). Tests indicated that one lag of the endogenous variable needed to be included as regressor. The total sum of the squared residuals has a global minimum in 1866. The testing procedure is

repeated for the subperiods 1815-1865 and 1866-1913, which suggested break years in 1845 and 1889, the local minima in Figure 2. So, we distinguish four subperiods below: 1815-1844, 1845-1865, 1866-1888, and 1889-1913.

[Figure 2 about here]

Our statistical method produces a similar periodisation as the more inductive, empirical approach of Horlings and Smits (1996, pp 21-23). We find a structural in 1889, whereas they date the break nine years earlier in 1880. Our conclusion corresponds to the observations of Jacobs and Smits (2001), who showed that the economy of the Netherlands followed the international business cycle more and more in the second half of the nineteenth century. The year 1889 seems to indicate a structural break in private consumption too. Apparently private consumption was positively driven by the the cyclical upturn from the 1890s to World War I.

Time series properties

The seond step of our empirical analysis consists of testing the time series properties of our time series. Table 1 lists the results for the whole sample and for the subperiods that resuteds from our periodisation test procedure, including the nature of the deterministic variables and the number of lags of the endogenous variable in the ADF. If a trend is included in the ADF equation, the KPSS equation has a trend too. For example, the ADF test equation of consumption (in natural logarithms) for the period 1866-1888 has a constant and a trend, but does not include lagged first differences of consumption, and produces a *t*-value of -2.393, which is not significant at the 5% level. So according the ADF test, the null of a unit root cannot be rejected for this variable in this period. The KPSS equation for consumption includes a trend and produces a test statistic of 0.152, which implies that the null hypothesis of stationarity is rejected at the 5% level for the 1866-1888 period.

[Table 1 about here]

Table 1 allows the following conclusions. We observe that ADF and KPSS tests quite often come to different conclusions, a phenomenon not unfamiliar in

the literature. However, the table shows that the series are I(1) for the whole sample, excluding the interest rate. Looking at the subperiods, the nature of consumption changes from stationary in the first two subsamples to I(1) in the periods after 1889. So, the structural break in 1889 involves a structural change in the process of consumption. For the other variables the results are less clear, but there is supportive evidence to treat the series as stationary in the first two subsamples and as I(1) thereafter.

Counterfactual VAR analysis

We implemented the counterfactual VAR analysis in the following way. We set up reduced form VARs for consumption and its determinants real wages food prices, excises, interest rate, and unemployment. The endogenous variables enter the system in first differences to render the VARs stationary. The order of VAR, the maximum lag in the system, has been determined on the basis of standard information criteria tests and is set equal to two periods. The subperiods distinguished are 1815-1865 and 1866-1913.

The results are listed in Table 2. We observe that the observed standard deviation of consumption hardly changes between the two subperiods

considered (3.8% and 3.9%). The same holds for the standard deviations implied by the VARs which are 0.1% smaller. However, if we impose the shocks of the first period on the lag structure the second subperiods, the counterfactual standard deviation that results is nearly two percentage points higher. The shocks of the second subpriod combined with the dynamics of the first period result in an increase in the standard deviation of a half percentage point. The observation that the counterfactual standard deviation for the second period exceeds the estimated standard deviation seems to hold also for the determinants of consumption. All counterfactual standard deviations listed in the final column of Table 2 are higher than the corresponding entries in the column labeled (2,2) , unemployment being the exception as expected.

The results of this counterfactual VAR analysis indeed point at the possibility that changes in consumer demand spurred industrial growth. First, it should be noted out that this change in demand in itself was of an exogenous nature, and primarily due to changes in the system of taxation. In that sense, Mokyr's critique that demand factor can only play a role in case they are of an exogenous nature, is acknowledged.

Secondly, it needs to be pointed out *how* this demand shock affected the pattern of industrial growth. There are strong indications that the rise in private

consumer expenditure removed scale constraints in the core industries of Dutch manufacturing, i.e. the food-processing, textiles and clothing industries (together comprising 75,6% of total value added in manufacturing). Smits (2000) already observed that especially the textiles and food-processing industries suffered from scale constraints in the first half of the nineteenth century. New—steam—technologies which were characterised by high fixed costs were not profitable in a context of low demand. It was simply cheaper to produce with the use of traditional technologies based on wind- and water power. However, as soon as the indirect taxes were lowered, these scale constraints were removed and a rapid modernisation of Dutch manufacturing can be observed. It was only after the lowering of the excises, that the use of steam rapidly diffused through the manufacturing sector and pushed aside traditional technologies.

6. Conclusion

This article presented an econometric analysis of private consumer expenditure in the Netherlands during the nineteenth century. The question is dealt with

why and how private consumer expenditure increased in the Neetherlands before as well as during the Industrial Revolution.

Our analysis consists of two parts. First, it is investigated whether sub-periods can be discerned in the time-series on private consumer expenditure. This search for structural breaking points has laid an econometric foundation under the earlier, more descriptive, work of Horlings and Smits. The periodisation that stems from this econometric exercise closely resembles this earlier work. However, instead of 1880 we identify 1889 as a breaking point, a finding that corresponds better with changes in the (international) business cycle.

Secondly, we apply a counterfactual VAR analysis to bring to the fore the extent to which changes in the determinants driving consumption affected the timing of Dutch industrialisation. The demand shock was largely brought about by an exogenous decline of the indirect taxes. Increases in private consumer demand removed scale constraints in the textiles and food-processing industries, enabling these branches to start to use modern (steam) technologies, which boosted productivity growth.

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Figure 1 *Time series of consumption and its determinants*

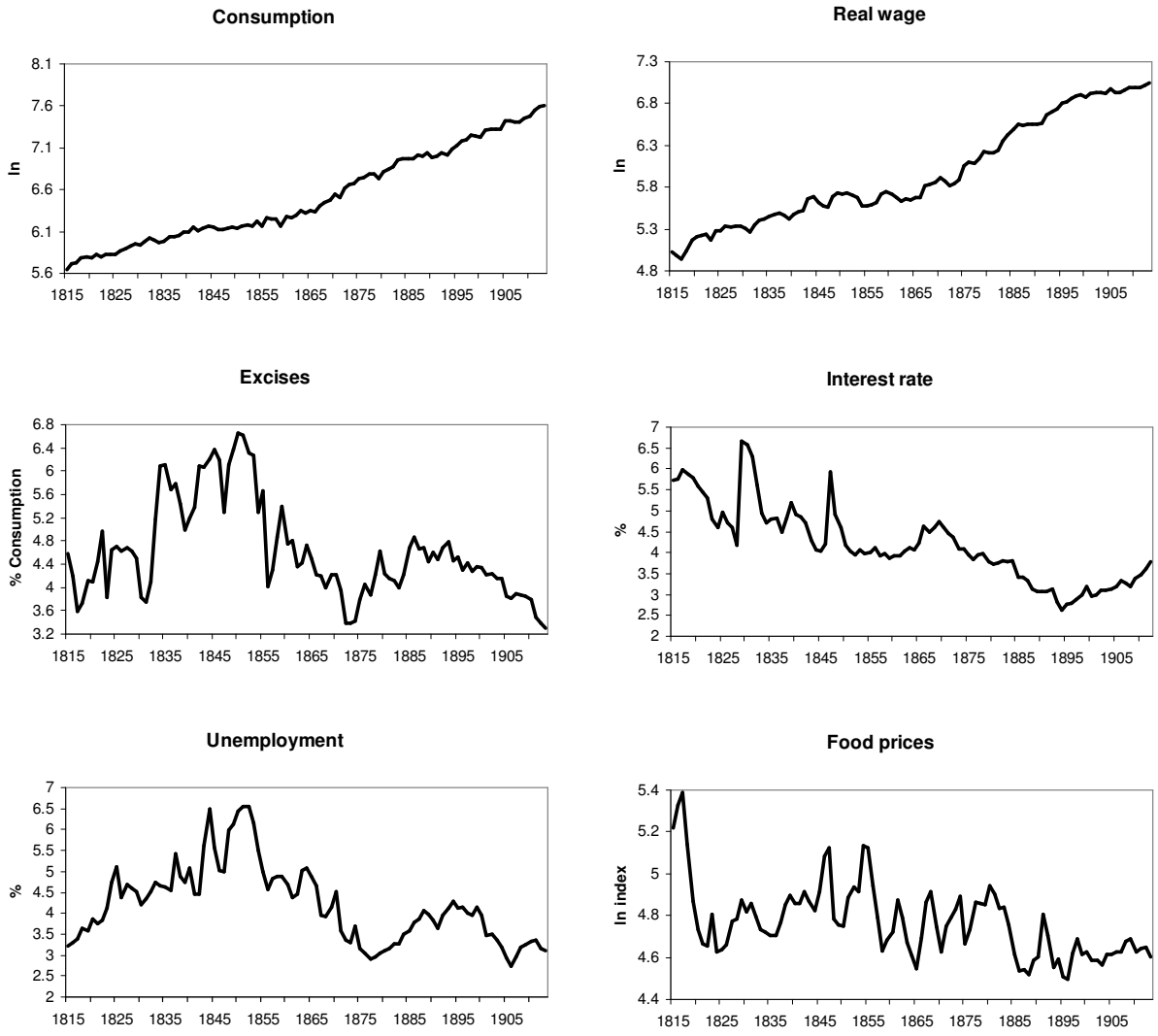

Figure 2 *Sum of squared residuals: consumption with structural break*

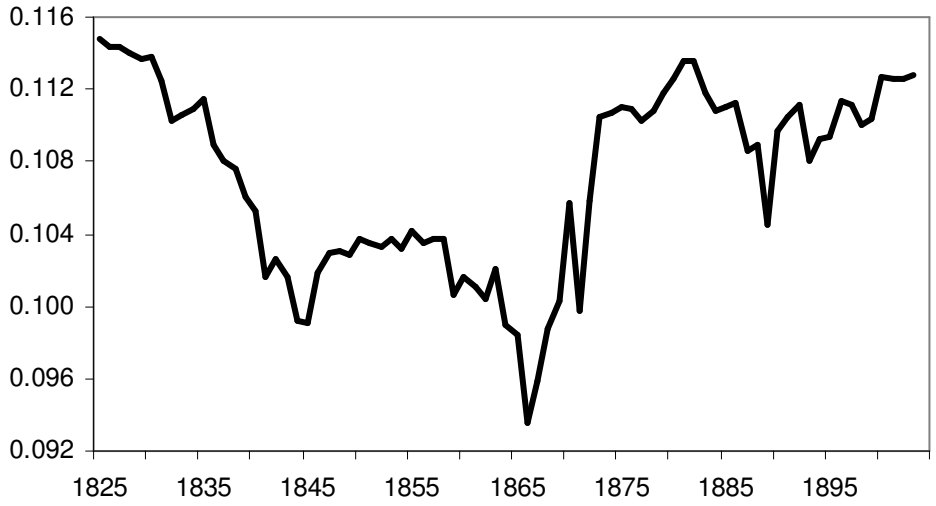

Table 1. Time series properties

	constant	trend	#lags	(A)DF	unit root	KPSS	unit root
	1815-1913						
Consumption (ln)	no	no	1	6.530	yes	1.321	yes
Real wage (ln)	no	no	0	4.024	yes	1.285	yes
Excises	yes	no	0	-2.217	yes	0.434	no
Unemployment	yes	yes	0	-2.767	yes	0.176	yes
Interest rate	yes	yes	0	-4.087	no	0.073	no
Food prices (ln)	yes	yes	0	-5.592	no	0.811	yes
	1815-1865						
Consumption (ln)	yes	yes	0	-4.465	no	0.196	yes
Real wage (ln)	yes	yes	1	-3.019	yes	0.218	yes
Excises	yes	no	0	-2.175	yes	0.365	no
Unemployment	yes	no	0	-2.438	yes	0.552	yes
Interest rate	yes	yes	0	-3.887	no	0.066	no
Food prices (ln)	yes	no	1	-4.083	no	0.141	no
	1866-1913						
Consumption (ln)	yes	yes	0	-3.20	yes	0.121	no
Real wage (ln)	no	no	0	4.19	yes	0.881	yes
Excises	no	no	0	-0.93	yes	0.204	no
Unemployment	yes	no	0	-2.75	yes	0.145	no
Interest rate	no	no	0	-0.42	yes	0.638	yes
Food prices (ln)	yes	yes	1	-4.33	no	0.553	yes

Table 1 (continued)

	constant	trend	#lags	(A)DF	unit root	KPSS	unit root
	1815-1844						
Consumption (ln)	yes	yes	5	-4.990	no	0.056	no
Real wage (ln)	yes	yes	4	-2.510	yes	0.110	no
Excises	yes	yes	2	-3.223	yes	0.123	no
Unemployment	yes	yes	1	-2.929	yes	0.105	no
Interest rate	yes	no	0	-2.275	yes	0.320	no
Food prices (ln)	yes	no	0	-2.201	yes	0.229	no
	1845-1865						
Consumption (ln)	yes	yes	0	-4.694	no	0.095	no
Real wage (ln)	yes	no	1	-3.253	no	0.091	no
Excises	yes	yes	0	-2.714	yes	0.075	no
Unemployment	no	no	0	-1.038	yes	0.334	no
Interest rate	yes	no	0	-2.585	yes	0.311	no
Food prices (ln)	yes	yes	1	-3.465	yes	0.090	no
	1866-1888						
Consumption (ln)	yes	yes	0	-2.393	yes	0.152	yes
Real wage (ln)	yes	yes	0	-2.255	yes	0.114	no
Excises	yes	yes	0	-2.276	yes	0.131	no
Unemployment	yes	yes	3	0.647	yes	0.185	yes
Interest rate	yes	yes	0	-3.566	yes	0.069	no
Food prices (ln)	yes	no	1	-2.618	yes	0.247	no
	1889-1913						
Consumption (ln)	yes	yes	0	-3.422	yes	0.077	no
Real wage (ln)	no	no	0	3.031	yes	0.664	yes
Excises	yes	yes	6	-2.251	yes	0.156	yes
Unemployment	no	no	0	-1.129	yes	0.542	yes
Interest rate	yes	yes	0	-1.865	yes	0.160	yes
Food prices (ln)	yes	no	0	-3.539	no	0.133	no

Table 2 Counterfactual VAR analysis

Variable	St dev		St dev of annual growth implied by the VAR (parameters of period I, shocks of period j)			
	1813-1865	1866-1913	estimated		counterfactual	
			(1,1)	(2,2)	(1,2)	(2,1)
consumption	0.038	0.039	0.037	0.038	0.043	0.056
real wages	0.054	0.045	0.523	0.044	0.041	0.069
food prices	0.114	0.089	0.109	0.085	0.076	0.170
excises	0.531	0.216	0.529	0.209	0.356	0.520
interest rate	0.527	0.152	0.529	0.150	0.208	0.496
unemployment	0.431	0.257	0.438	0.517	0.266	0.250