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**HIEL-23**

# Historical Index of Economic Liberty

## Concept, Sources and Procedures

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# CONCEPTS

## Historical Index of Economic Liberty<sup>1</sup>

Economic liberty is a ‘negative’ freedom, defined as lack of interference or coercion by others on an individual’s economic decisions. Personal choice, voluntary exchanges, access to markets, and protection of persons and their property from aggressions are its constitutive elements.

A country can be considered economically free in so far people and privately owned property are securely protected, contracts enforced, prices stable, barriers to trade small, and resources mainly allocated through the market. Assessing the consistency of a nation’s institutions and policies with these requisites is the purpose of any index of economic freedom.

Four main dimensions of economic freedom are distinguished: legal system and property rights, sound money, international openness, and regulation.

For each dimension of economic freedom an index, consistent over space and time, is computed on the basis of different indicators.

When the indicator’s value is inversely related to the degree of economic freedom, it has been transformed into index form using the expression

$$I_{ij} = 10 (V_{MAX} - V_{ij}) / (V_{MAX} - V_{MIN})$$

Where  $V_{ij}$  represents the value of country  $i$  indicator at year  $j$  and  $V_{MAX}$  and  $V_{MIN}$  its maximum and minimum values.

Alternatively, when the value of the indicator is directly related to the value of economic freedom, it is the following expression the one used,

$$I_{ij} = 10 (V_{ij} - V_{MIN}) / (V_{MAX} - V_{MIN})$$

Thus, in either case the resulting index of economic freedom ranges between 0 (minimum) and 10 (maximum).

The period considered is that of the spread of modern capitalism, namely, the epoch covering from the emergence of free trade and laissez faire in the mid-nineteenth century to the present.

### Legal System and Property Rights

The rule of law, security of property rights, judicial independence, and impartial courts are major components of a legal structure consistent with economic liberty. Indicators have been chosen for the following dimensions:

- Judicial independence
- Impartial courts
- Integrity of the legal system
- Contract Enforcement

An aggregate index has been obtained as the unweighted arithmetic average of these four sub-indices.

### Sound Money

The main contribution of a monetary system to protect economic freedom is to provide stable prices. Inflation erodes the value of property held in monetary instruments. Furthermore, high and volatile inflation rates distort relative prices and alter long-term contracts, making difficult for individuals to plan for the future.

1. The Historical Index of Economic Liberty (HIEL) is inspired on the Fraser Institute’s Economic Freedom of the World Index (EFW) (Gwartney et al., 2022). The main departure from the EFW is the exclusion of “the size of government” as a component of the index. A detailed explanation of the sources and procedures used to construct the index can be consulted in this website. A discussion of the concept and earlier results are provided in Prados de la Escosura (2016).

The measures chosen to assessing the consistency of monetary policy and institutions with long-term price stability are:

- **Inflation rate**,
- **Standard deviation of inflation** (as a measure of volatility).
- **Differential money growth** –the difference between the average annual growth of the money supply in the last five years and the average annual growth of real GDP in the last ten years–. Its rationale is that high rates of monetary growth lead to inflation.

An aggregate index has been derived as the unweighted arithmetic average of these three sub-indices.

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### International Openness

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Free trade represents a key dimension of economic liberty as it provides individuals with the widest possible choice of goods and services and facilitates specialisation along comparative advantage. By not interfering with the freedom to enter and compete in international factor and commodity markets, governments promote economic freedom.

In order to assess economic freedom in international trade a variety of restraints need to be considered including tariffs, the exchange rate, and capital controls. Three indicators have been used:

- **Tariffs**. Weighted nominal protection measured as the ratio of total tariff revenue to the value of total exports and imports.
- **Factor Mobility**. It is the average of indices for capital and labour mobility.
- **Black Market Premium** measured as the difference in logs between the official and the parallel (black market) exchange rate (from 1946 onwards).

An aggregate index has been obtained as the unweighted arithmetic average of the three sub-indices.

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### Regulation

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Regulation of economic activities can restrict market freedom of entry by interfering with individuals' decision to engage in voluntary exchange. Three types of regulation have been distinguished.

#### Credit market regulation.

It is composed of two indicators:

- **Interest rate control**, approximated by real short-term interest rates (that, is the nominal short-term interest rate less inflation).
- **Private Sector Credit** proxied by the government fiscal deficit as a proportion of GDP.

A sub-index of credit market regulation has been obtained as the unweighted arithmetic average of these two indices.

#### Labour market regulation

Laws and regulations affecting wages and working conditions may restrict negative economic liberty by constraining labour market flexibility. Three indicators have been chosen:

- **Freedom of domestic movement**
- **Freedom from forced labour**
- **Employment protection legislation (EPL)**. An index that proxies the regulation in the labour market in the post-1950 era.

And its unweighted arithmetic average provides the sub-index of labour regulation



Business regulation

Impartial public administration

An aggregate index has been derived as an unweighted arithmetic average of the three sub-indices.

Table 1  
Dimensions of the Historical Index of Economic Liberty (HIEL) and their Components

Legal System and Property Rights	Sound Money	International Openness	Regulation
Judicial Independence	Inflation Rate	Weighted Nominal Protection	Credit Market Regulation
Impartial Courts	Inflation Variability	International Factor Mobility	Labour Market Regulation
Integrity of the Legal System	Differential Money Growth	Black Market Premium (post-1950)	Business Regulation
Contract Enforcement			

An Aggregate Index of Economic Liberty

Then, the indices for each dimension (namely, property rights, money, international trade, and regulation) are combined as an unweighted average into a historical index of economic liberty (HIEL), which ranges between 0 and 10.

Thus,

$$HIEL = (IEL_{property\ rights} + IEL_{money} + IEL_{openness} + IEL_{regulation}) / 4$$

References

Gwartney, J., R. Lawson, J. Hall, y R. Murphy (2022), *Economic Freedom of the World: 2022 Annual Report*, Vancouver: Fraser Institute.

Prados de la Escosura, L. (2023), *Economic Freedom in Retrospect* (mimeo)

Prados de la Escosura, L. (2016), *Economic Freedom in the Long Run: Evidence from OECD Countries (1850-2007)*, *Economic History Review* 69(2): 435-468.

Alert: measuring changes in the index

By how much did economic liberty improve over the long run? Given the bounded nature of the index (it ranges from 0 to 10), the use of conventional procedures to summarize its evolution -say, the percentage change or the logarithmic rate of variation-, would be misleading as increases achieved at low levels cannot be matched at high levels. It is preferable, therefore, to consider the absolute shortfall of actual economic freedom from the upper bound (a value of 10) at the initial point in time and, then, computing the relative decline in the shortfall over a given period. Thus, the improvement achieved in economic liberty is measured as the proportion of the maximum possible.

This means that if in 1850/54 the initial gap with respect to the maximum potential level (10) was 3.48 points for the unweighted OECD average, and by 2016/20 it had been cut down to 1.36 points, the shortfall would have declined by 61 percent [(3.48-1.36)/3.48=0.61].

However, the shortfall reduction approach is not additive meaning that the percentage shortfall reductions over two periods, say, 1850-1914 and 1914-1950, does not amount to the shortfall reduction from 1850-1950.



# SOURCES AND PROCEDURES

## Appendix

Four dimensions of economic freedom are distinguished: legal system and property rights, sound money, international openness, and regulation.

For each dimension of economic freedom a consistent index over space and time has been computed on the basis of different indicators. The period considered is that of the spread of modern capitalism, namely, the epoch covering from the emergence of free trade and laissez faire in the mid-nineteenth century to the present.

When the indicator's value is inversely related to the degree of economic freedom, it has been transformed into index form using the expression

$$I_{ij} = 10 * (V_{MAX} - V_{ij}) / (V_{MAX} - V_{MIN})$$

Where  $V_{ij}$  represents the value of country  $i$  indicator at year  $j$  and  $V_{MAX}$  and  $V_{MIN}$  its maximum and minimum values

Alternatively, when the value of the indicator is directly related to the value of economic freedom, it is the following expression the one used,

$$I_{ij} = 10 * (V_{ij} - V_{MIN}) / (V_{MAX} - V_{MIN})$$

Thus, in either case the resulting index of economic freedom ranges between 0 (minimum) and 10 (maximum).

## Area 2 Legal System and Property Rights

Indicators A) to C) have been selected from the **V-Dem** database (Coppedge et al., 2022) (the series code appears in brackets).

**A) Judicial Independence.** It combines two sub-indices:

- High Court Independence (v2juhcind)
- Low Court Independence (v2juncind)

### B) Impartial Courts

- Judicial corruption decision (v2juccorrdc)

**C) Integrity of the Legal System.** This index results of combining the sub-indices

- *Judicial accountability* (v2juacnt)
- *Compliance with high court* (v2juhccomp)
- *Compliance with the judiciary* (v2jucomp)
- *Transparent laws with predictable enforcement* (v2cltrnslw)
- *Access to justice for men and women* (v2clacjstm and v2clacjstw)

**D) Contract Enforcement.** The Contract-Intensive Money (CIM) proxies it.

CIM measures the percentage of deposits in money supply:  $CIM = (M2 - C)/M2$ , in which  $C$  represents currency outside banks and  $M2$  the money supply including all (current and term) deposits.

In the construction of the transformed index, the range within which CIM fluctuates, 1 and 0, has provided the upper and lower bounds. A shortcoming of CIM estimates for countries in early stages of economic development derives from the use by the public of alternative options to deposits (i.e., bills of exchange) that enlarged in practice money supply, with the consequence of a downward bias in CIM. As a crude correction, I have assumed a 'floor' of 0.2 for CIM.

## Monetary aggregates

The sources for sources used for each country are,

**Australia**, Vamplew (1987), up to 1983; IMF, 1984-1958; Reserve Bank of Australia (RBA), 1959-2020.

**Austria**, (Austria-Hungary up to 1913), Jobst and Scheiber (2014), currency outside banks; Komlos (1987), demand and time and savings deposits; Mitchell (2008), 1925-37, 1946-53; IMF, 1953-1996; Österreichische Nationalbank (OeNB), 1997-2020 <https://www.oenb.at/isaweb/report.do?lang=EN&report=1.3.2>

**Belgium**, Mitchell (2008), banknote in circulation and time and savings deposits, 1850-1950; Banks (2010), demand deposits, except for 1870-74 in which the level for 1875 is projected backwards with banknotes in circulation; Mitchell (2008), 1950-68; IMF, 1969-2012; 2013-2020, money in circulation, IMF; money supply, JST v.6.

**Canada**, Mitchell (2008), 1856-1913; McInnis (2001), 1871-1913; Canadian Historical Statistics, 1913-68; Bank of Canada, 1868-2020.

**Denmark**, Mitchell (2008), 1850-1948; IMF, 1948-2020.

**Finland**, Mitchell (2008), 1862-1950; IMF, 1950-2012; 2013-2020, money in circulation, IMF; money supply, JST v.6.

**France**, Mitchell (2008), 1850-1947; Saint-Marc (1983), demand deposits, 1850-1944; IMF, 1948-2012; 2013-2020, money in circulation, IMF; money supply, JST v.6.

**Germany**, Mitchell (2008), 1850-1920, 1923, 1944; Ritschl (2002), 1924-1943; IMF, 1950-2012; 2013-2020, money in circulation, IMF; money supply, JST v.6.

**Greece**, Lazaretou (2014), 1850-1939; IMF, 1953-2000; Bank of Greece, 2001-2020. Estimates for 1939 and 1946-52 were computed by projecting the CIM level for 1953 with an alternative CIM derived with M1 from Mitchell (2008).

**Ireland**, Mitchell (2008), 1913-32; Gerlach and Stuart (2014), 1932-2012; 2013-2020, money in circulation, IMF; money supply, JST v.6.

**Italy**, de Bonis et al. (2012), 1861-2010; 2010-2020, money in circulation, IMF; money supply, JST v.6.

**Japan**, Currency outside banks, Mitchell (2008), 1913, 1925-39, 1950-52; Deposits, Patrick (1967), 1888-1910; Yamamura (1972), 1911-1926. Estimates for 1873-87, 1927-39, and 1950-52 were computed with Mitchell (2008) re-scaled to match the levels for 1888, 1926,

and 1953, respectively. IMF, 1953-2001; Bank of Japan, 2001-2020.

**Netherlands**, 1850-1912, Data on demand deposits is lacking. The persistence of the *prolongatie* market explains the slow development of deposits in Dutch commercial banking (Jonker, 1997: 101-102) and, perhaps, why there is no record of demand deposits. In fact, the public used money put on *prolongatie* as a form of interest-bearing demand deposits backed by securities, and thus it provides a substitute for demand deposits (I owe this remark to Joost Jonker). As a crude alternative, M1 (that is, currency outside banks and demand deposits) was estimated over 1850-1912 by projecting its level in 1913 backwards with data on currency outside banks from Mitchell (2008). Time and savings deposits also come from Mitchell (2008). Mitchell (2008), 1918-50; IMF, 1950-2012; 2013-2020, money in circulation, IMF; money supply, JST v.6.

**New Zealand**, Currency outside banks, Mitchell (2008), 1870-1939; IMF, 1950-88; Reserve Bank of New Zealand, 1988-2020. Demand deposits, 1850-1913, Statistics New Zealand; Time and savings deposits, Mitchell (2008); All deposits, Statistics New Zealand, 1925-64; IMF, 1965-1988; Reserve Bank of New Zealand, 1988-2020.

**Norway**, Eitrheim, Klovland, and Qvigstad (2022).

**Portugal**, Reis (1990), 1854-1912; Reis (2001), 1850-53, 1913-50; Pinheiro (1997), 1950-95; IMF, 1996-2012; 2013-2020, money in circulation, IMF; money supply, JST v.6.

**Spain**, 1850-55, Tortella (1982), currency in circulation, and Tedde (1999), notes in circulation. 1856-73, Banco de España (1970), currency outside banks; 1850-73, Martín-Aceña and Pons (2005), demand deposits; time and savings deposits: Tortella's (1985) deposits estimates less sight deposits in private banks (Martín-Aceña and Pons, 2005), provide an estimate of time deposits, to which I added non-banking savings deposits from Titos (1999). 1874-99, Tortella (1974); 1900-1935, Martín-Aceña (1985); 1941-2000, Martín-Aceña and Pons (2005); IMF, 2000-2012; 2013-2020, money in circulation, IMF; money supply, JST v.6.

**Sweden**, 1850-2012, Edvinsson and Ögren (2014); Statistics Sweden, 2012-2020.

**Switzerland**, Historical Statistics of Switzerland, 1851-1950, In the absence of data on time and savings deposits, it was assumed that it moved along demand deposits, so the level of total deposits in 1906 was backwards projected with the data on demand deposits; Swiss National Bank (2023), 1950-2020.

**United Kingdom**, Currency (notes and coin) in the hands of the public//in circulation, Bank of England. 1850-70, Currency outside banks, 1850-70. Two alternative estimates were derived and its average taken. On the one hand, Mitchell (1988), coin level for 1870 was backwards projected with Huffman and Lothian (1980) figures and added up to Mitchell (2008) banknotes in circulation. On the other, Hills et al. (2010) currency outside banks in 1870 was projected backwards with Huffman and Lothian (1980) total figures for coin and notes outside banks. 1871-1981, the average of estimates by Hills et al. (2010) and by Capie and Webber (1985) was used. From 1982 onwards, Hills et al. (2010) was employed. Deposits, Collins (1983), demand deposits (derived from net public liabilities of commercial banks, which include notes and deposits); and Mitchell (1988, 2008), savings deposits. 1871-1981, Capie and Webber (1985); 1982-2009, Hills et al. (2010); 2010-2020, Bank of England. Pre-1982 figures were adjusted to match the level of 1982 derived from data in Hills et al. (2010).

**United States**, 1850-66, Anderson (2003), currency outside banks derived by projecting its level in 1867 backwards with the series of all notes and coin; figures for all deposits obtained by projecting backwards Anderson (2003) level for 1867 with the series of deposits provided by Mitchell (2008); Anderson (2003), 1867-2002; FRED, 2003-2020.

**Note:** In the Eurozone or Euro-Area, since the introduction of the Euro, there are data on 'national contributions to monetary aggregates' rather than national aggregate. This is due to the fact that the European Central Bank does not publish data on national contributions to euro area monetary aggregates (and counterparts) because for some components the allocation by country is not straightforward. See

<https://www.oenb.at/isaweb/report.do?lang=EN&report=13.7>

## A3 Sound Money

### A) Inflation Rate

The consumer price index (CPI) has been used as the measure of inflation for this component. When the CPI was unavailable, the implicit GDP deflator was used. To be consistent with the view that price stability is what guarantees economic freedom the absolute value of inflation has been considered. It has been transformed into index form using the expression

$$I_{ij} = 10 * (V_{MAX} - V_{ij}) / (V_{MAX} - V_{MIN})$$

Where  $V_{ij}$  represents the value of country  $i$  indicator at year  $j$  and  $V_{MAX}$  and  $V_{MIN}$ , its maximum and minimum values, 50 and 0, respectively.

### B) Standard Inflation Variability during the last five years

The GDP deflator was used as the measure of inflation for this component. When unavailable, the CPI was used. To be consistent with the view that price stability is what guarantees economic freedom the absolute value of inflation has been considered. It has been transformed into index form using the expression

$$I_{ij} = 10 * (V_{MAX} - V_{ij}) / (V_{MAX} - V_{MIN})$$

Where  $V_{ij}$  represents the value of country  $i$  indicator at year  $j$  and  $V_{MAX}$  and  $V_{MIN}$ , its maximum and minimum values, 25 and 0, respectively.

### C) Money Growth Differential

Derived as the absolute value of the difference between the average annual growth of the money supply in the last five years and the average annual growth of real GDP in the last ten years. M1 figures were used to measure the growth rate of the money supply. It has been transformed into index form using the expression

$$I_{ij} = 10 * (V_{MAX} - V_{ij}) / (V_{MAX} - V_{MIN})$$

Where  $V_{ij}$  represents the value of country  $i$  indicator at year  $j$  and  $V_{MAX}$  and  $V_{MIN}$ , its maximum and minimum values, 50 and 0, respectively.



The following national sources, completed with Jordà-Schularick-Taylor (JST) and Gwartney et al., 2022 (EFW) datasets, have been used:

### **CPI and GDP Deflator and Volume**

**Australia**, Hutchinson and Ploeckl (2022).

**Austria**, CPI, Reinhart and Rogoff (2011), 1850-63; Jobst and Scheiber (2014), 1863-1913; Maddison (1991), 1913-39; IMF, since 1950; OECD, since 2000. GDP deflator, derived from nominal GDP, Mitchell (2008), 1925-37, and IMF, 1950-60, and real GDP, Maddison (2010). 1960 onwards, IMF (1960-70) and OECD (1970-2020). Real GDP, Schulze (1997), up to 1913; Maddison (2010), 1913-1990. Conference Board, 1990-2020.

**Belgium**, CPI, Maddison (1991), 1850-1939; IMF, 1950-2000; OECD, 2000 onwards.

GDP deflator, 1850-1913, Horlings (1997); 1925-39, average of Buyst (1997), income and expenditure, and Horlings (1997), output deflators; derived from nominal GDP (IMF) and real GDP (Maddison, 2010), 1946-60; OECD, GDP deflator, 1960 onwards. Real GDP, 1850-1913, Horlings (1997); 1925-39, average of Buyst (1997), income and expenditure, and Horlings (1997), output; Maddison (2010) and Conference Board, thereafter.

**Canada**, CPI, Geloso (2019), 1850-2015; OECD, 2015-2020. GDP deflator, Urquhart (1993), 1870-1950; IMF and OECD, since 1950. Real GDP, Urquhart (1993), 1870-1939; Maddison (2010) and Conference Board thereafter.

**Denmark**, CPI, Mitchell (2008), 1850-70; Maddison (1991), 1870-1950; IMF and OECD, since 1950. GDP deflator, Derived from nominal GDP, Hansen (1974), 1850-1939 and IMF, 1950 onwards, and real GDP from Maddison (2010). Real GDP, Maddison (2010), 1850-1990; Conference Board, 1990-2020.

**Finland**, CPI, Heikkinen (1997), 1850-1913; Hjerpe (1996), 1913-50; IMF, 1950-2000; OECD 2000 onwards. GDP deflator, derived from nominal GDP Hjerpe (1996), 1860-1960, and real GDP, Maddison (2010); 1960-2020, OECD. Real GDP, Maddison (2010), 1860-1990; Conference Board, 1990-2020.

**France**, CPI, Lévy-Leboyer and Bourguignon (1985), 1850-1913; Maddison (1991), 1913-50; IMF, 1950-2000; OECD, from 2000 onwards. GDP deflator, Toutain (1997), 1850-1950; IMF, 1950-2000; OECD, 2000-2020. Real GDP, Toutain (1997), 1820-1913, Maddison (2010), 1924-1990; Conference Board, 1990-2020.

**Germany**, CPI, Mitchell (2008), 1850-70; Maddison (1991), 1870-1939; IMF, 1950-93; DeStatis [www.destatis.de](http://www.destatis.de), 1993-2000; OECD, 2000 onwards. GDP deflator, Ritschl and Spoerer (1997), 1901-44; IMF, 1960-2000; OECD, 2000-2020. Real GDP Burhop and Wolff (2005), 1851-1913; Ritschl and Spoerer (1997), 1913-50; Maddison (2010), 1950-1990; Conference Board, 1990-2020.

**Greece**, CPI, Mitchell (2008), 1914-1939; IMF, 1950-2000; OECD, 2000-2020.

GDP deflator, Kostelenos et al. (2007), 1850-1937; UN (1950), 1937-39; IMF, 1950-2000; OECD, 2000-2020. Real GDP Kostelenos et al. (2007), 1850-1939; IMF, 1950-1959; Conference Board, 1960-2020

**Ireland**, CPI, Mitchell (2008), 1914, 1925-33; Gerlach and Stuart (2015), 1933-2000; OECD, 2000-2020. GDP deflator, Gerlach and Stuart (2015), 1933-2000; OECD, 2000-2020. Real GDP, Maddison (2010), 1922-1933; Gerlach and Stuart (2015), 1933-1990; Conference Board, 1990-2020.

**Italy**, CPI, ISTAT, 1861-2011; OECD, 2011-2020. GDP deflator, Baffigi (2013), 1861-2000; OECD, 2000-2020. Real GDP, Baffigi (2013), 1861-2000; Conference Board, 2000-2020.

**Japan**, CPI, Reinhart and Rogoff (2011), 1850-79; Maddison (1991), 1879-1939; IMF, 1950-2000 and OECD, 2000-2020, since 1950. GDP deflator, derived from nominal GDP, Ohkawa and Shinohara (1979), 1885-1951, and IMF, 1951-55, and real GDP (Maddison 2010), 1885-1955; Historical Statistics Japan, 1955-2003; OECD, 2003 onwards. Real GDP, Maddison (2010).

**Netherlands**, CPI, Maddison (1991), 1870-1950; IMF, 1950-2000; OECD, 2000-2020.

GDP deflator, Smits et al. (2000), 1850-1913; den Bakker et al. (1990), 1925-39; IMF, 1950-60; OECD, 1960-2020. Real GDP, , Smits et al. (2000), 1850-1913; Maddison (2010), 1913-1950; Conference Board, 1950-2020

**New Zealand**, CPI, Statistics New Zealand, 1857-2004; OECD, 2004 onwards. GDP deflator, Statistics New Zealand, 1860-2000; OECD, 2000 onwards. Real GDP, Statistics New Zealand, 1860-2004; Conference Board, thereafter.

**Norway**, CPI, GDP deflator, and real GDP, Grytten (2022).

Portugal, CPI, Valério (2001), 1850-1939; IMF, since 1950. GDP deflator and real GDP, Lains (2003), 1850-1910; Batista et al. (1997), 1910-53; Pinheiro (1997), 1953 onwards.

**Spain**, CPI, Maluquer de Motes (2005, 2006), 1850-2001; INE, <http://www.ine.es/>, since 2001. GDP deflator and real GDP, Prados de la Escosura (2017, updated)

**Sweden**, CPI, Edvinsson and Söderberg (2007), 1850-2006; Statistics\_Sweden, 2007

GDP deflator and real GDP, Schön and Krantz (2012)

**Switzerland**, CPI, Historical Statistics Switzerland, 1850-2000; OECD, 2000-2020.

GDP deflator, Historical Statistics Switzerland, 1851-2000; OECD, 2001-2020. Real GDP, Historical Statistics Switzerland, 1851-2000; Conference Board, 2000-2020.

**United Kingdom**, CPI, Hills et al. (2010), 1850-2000; OECD, 2000-2020 and GDP deflator, Hills et al. (2010), 1830-2000; OECD, 2000-2020. Real GDP, Hills et al. (2010), 1830-2000; Conference Board, 2000-2020

**United States**, Williamson (2022).

#### Area 4 International Openness

**A) Tariffs.** Weighted nominal protection measured as the ratio of total tariff revenue to the value of total exports and imports

As the indicator's value is inversely related to the degree of economic freedom, it has been transformed into index form using the expression

$$I_{ij} = 10 * (V_{MAX} - V_{ij}) / (V_{MAX} - V_{MIN})$$

Where  $V_{ij}$  represents the value of country  $i$  indicator at year  $j$  and  $V_{MAX}$  and  $V_{MIN}$  its maximum and minimum values set at 30 and 0

Data from Mitchell (2008) and World Bank (2013) for the post-1970 era, were complemented, when necessary, with national sources and EFW since 1999.

**Australia**, Vamplew (1987), 1850-1900; Mitchell (2008), post-1900.

**Austria**, Trade, crude computations from data on the share of Imperial Austria in Austria-Hungary trade derived from Eddie (1980) for 1880-1913 and extended back to 1850. Eddie (1980) provides Imperial Austria's share in Austria-Hungary trade and, therefore, trade by Imperial Austria can be derived, which includes re-exports to and from Hungary. Eddie presents shares of Austria in Hungary's trade, so

Austrian trade with the rest of the World can easily be computed. A difficulty appears as regards the share of Austrian trade with Hungary that represents domestic exports and retained or net imports and not just re-exports. Given the lack of information, I decided to consider re-exports negligible and to attribute all the trade between Imperial Austria and Hungary to domestic exports and retained imports. The computed share of Austria in Austria-Hungary trade for 1880 was applied to trade figures for Dual Monarchy in earlier years in order to derive Austrian exports and imports back to 1850

**France**, Customs revenues, Mitchell (2008); imports, Lévy-Leboyer (1977), 1850-1913.

**Netherlands**, Smits et al. (2000), 1850-1913; 1925-39, customs revenues, Mitchell (2008); imports, den Bakker et al. (1990).

**New Zealand**, Customs revenues, Mitchell (2008); imports, Statistics New Zealand.

**Portugal**, Lains (1995) and Valério (2001).

**Spain**, Tena (2005).

**B) Black Market Premium** measured as the absolute difference in logs between the official and the parallel (black market) exchange rate (from 1946 onwards).

Data for all countries come from Reinhart and Rogoff (2003, 2004) database except for Spain, for which a weighted measure from Prados de la Escosura et al. (2012) has been accepted. Since the indicator's value is inversely related to the degree of economic freedom, it has been transformed into index form using the expression

$$I_{ij} = 10 * (V_{MAX} - V_{ij}) / (V_{MAX} - V_{MIN})$$

Where  $V_{ij}$  represents the value of country  $i$  indicator at year  $j$  and  $V_{MAX}$  and  $V_{MIN}$  its maximum and minimum values set at 50 and 0

#### C) International Factor Mobility

##### Capital

For the pre-1950 period I have built an index of capital mobility that assigns values over a 0-10 range to each country, depending on its currency convertibility. The values assigned in this exploratory exercise are, unfortunately, largely discretionary.

Thus, before 1914, a value of 10 has been assigned to those countries in the Gold Standard. For countries that did not belong to the Gold Standard, with convertible currencies or bimetallic standards,

as well as for those shadowing the Gold Standard, an initial value of 8 has been set. However, each country's value deviates from the initial level on the basis of its exchange rate volatility (ERV) against the Sterling (Table 1).

In the Interwar years (defined here as the period 1925-39), before the reintroduction of the Gold Standard as a Gold Exchange Standard, a value of 5 was attributed to the following countries: Belgium, Denmark, Greece, and Italy during 1925-26; France, Ireland, Norway, and Portugal (1925-28); Japan (1925-29), and Spain (1925-30). Countries in the Gold Exchange Standard were assigned a value of 7, lower than prior to 1914, as the international capital market was subjected to major dislocations and capital flows tapered in the 1920s and, especially, during the Depression (Eichengreen, 1992; Obstfeld and Taylor, 2004: 132-45).

Table 1  
**Assigned Capital Mobility Values to Degrees of Exchange Rate Volatility before 1914**

Exchange Rate Volatility	Capital Mobility Value
< 0.05	8
<0.1>0.05	7
<0.2>0.1	6
<0.3>0.2	5
<0.4>0.3	4

Then, after the convertibility into gold was suspended in the UK (1931), a value of 5 has been assigned to those countries whose currency was pegged to the Sterling. Thus, it applied Australia, New Zealand, Canada, Ireland, Portugal, Norway, Sweden, and Greece (after 1936). In the case of France, after the Gold Standard was abandoned (1936), the value attributed to the Franc was also 5 and this also extended to those currencies in the 'gold bloc' (Belgium, the Netherlands, Switzerland, and Italy). In those cases in which exchange control was introduced but the currency was still pegged to the Sterling or French Franc, the value was reduced to 3. These were the cases of Austria, Belgium (1935), Denmark, and Finland (after 1934), Japan, and New Zealand (1939). When in addition to exchange controls there were multiple exchange rates, the attributed value was 1 (Germany since 1932, Austria since 1938, Italy since 1937), and, in the case of Spain, a value of 0 was assigned since mid-1936, when its civil war

started.

Data come from Flandreau and Zumer (2004) (who described this measure as an index of vulnerability). I replicated the index for missing dates and countries on the basis of the information in Bordo and Schwartz (1996), Eichengreen (1992), Eichengreen and Flandreau (1996), League of Nations (1925-1939), and Reinhart and Rogoff (2003, 2004, 2010).

For the post-1950 period, Quinn and Todoya (2008) provide de jure measures of capital account and financial current account openness and I have taken their average. As these estimates only cover the period 1950-2004, I have projected them forward with Chinn and Ito (2021) KAOPEN index, a de jure measure of a country's capital account openness.

### Labour

*Freedom of Foreign Movement.* This indicator comes from the V-Dem database (Coppedge et al., 2022) (v2clfmov). As the value of the indicator is directly related to the value of economic freedom, it is the following expression the one used,

$$I_{ij} = 10 * (V_{ij} - V_{MIN}) / (V_{MAX} - V_{MIN})$$

Where  $V_{ij}$  represents the value of country  $i$  indicator at year  $j$  and  $V_{MAX}$  and  $V_{MIN}$ , its maximum and minimum values.

## Area 5 Regulation

### A) Credit Market Regulation

- *Private Sector Credit* proxied by the government fiscal deficit as a proportion of GDP.

Original values have been transformed into index form using the expression

$$I_{ij} = 10 * (V_{ij} - V_{MIN}) / (V_{MAX} - V_{MIN})$$

Where  $V_{ij}$  represents the value of country  $i$  indicator at year  $j$  and  $V_{MAX}$  and  $V_{MIN}$ , its maximum and minimum values, 20 and -50 per cent.



The data come from Mauro et al. (2013), completed with JST and OECD. National sources have been used for Austria (Austria-Hungary), 1850-1913, Jobst and Scheiber (2014); Greece, 1850-1939, Lazaretou (2014); Portugal, Marinheiro (2006), and Spain, Comín (2005 and private communication).

- *Interest Rate Control* proxied by the real short-term interest rate, that is, the nominal short-term interest rate less inflation. Real interest rates have been transformed into index form using the expression

$$I_{ij} = 10 * (V_{ij} - V_{MIN}) / (V_{MAX} - V_{MIN})$$

Where  $V_{ij}$  represents the value of country  $i$  indicator at year  $j$  and  $V_{MAX}$  and  $V_{MIN}$ , its maximum and minimum values, 20 and -20, respectively.

Data on short-run interest rates come from Homer and Sylla (2005) and JST, IMF and OECD, from 1950 onwards, unless expressed explicitly in country sources. Inflation rates come from the sources used for Area 2.

The national sources used are,

**Australia**, Vamplew (1987), 1850-1936; Homer and Sylla (2005), 1937-67; OECD, 1968-2020.

**Austria**, Jobst and Scheiber (2014), 1863-1913; Morys (private communication), 1925-39; IMF, since 1950. Homer and Sylla (2005), 1945-1966; OECD, 1967 onwards.

**Belgium**, Homer and Sylla (2005), 1850-1959; OECD, 1960-2020

**Canada**, McInnis (2001), 1871-1939; Homer and Sylla (2005), 1935-60 1950-89; IMF, 1990 OECD, 1960-2020.

**Denmark**, Abildgren (2005), 1875-2003; OECD, 2004-20.

**Finland**, Bank of Finland. 1867-69; JST6, 1870-1969; OECD, 1970-2020.

France, Lévy-Leboyer and Bourguignon (1985), 1850-1913; Homer and Sylla (2005), 1914-1969; OECD, 1970-2020..

**Germany**, Homer and Sylla (2005), 1850-1913, 1925-1939; IMF, since 1950-2011; OECD, 2012-2020.

**Greece**, Lazaretou (2014), 1850-1939; IMF, 1950-1994; OECD, 1995-2020.

**Ireland**, JST6, 1923-1932; Gerlach and Stuart (2014), 1933-2012; OECD, 2013-2020.

**Italy**, de Bonis et al. (2012), 1862-1884; JST6, 1885-1914, 1922-70; Cotula et al. (1996), 1915-21; OECD, 1971-2020.

**Japan**, Homer and Sylla (2005), 1883-1939; Historical Statistics Japan, 1950-2000; IMF, 2001-20.

**Netherlands**, Homer and Sylla (2005), 1850-69, 1900-59; JST6, 1870-99, 1913-14, 1942-45; OECD, 1960-2020.

**New Zealand**, Homer and Sylla (2005), 1934-47; Statistics New Zealand, 1948-1973; OECD, 1974-2020. The 1934 level was backwards projected to 1912 with the Nominal Mortgage Interest Rate and, then, to 1859, with Australia's interest rate series.

**Norway**, Eitrheim et al. (2022).

**Portugal**, Reis (2007), 1863-87; Flandreau and Zumer (2004), 1888-90; Valério (2001) and Pinheiro (1997), 1891-69; OECD, 1970-2020.

**Spain**, Tortella (1973), Banco de Barcelona, 1850-1873; Martín-Aceña and Pons (2005), 1874-1976; OECD, 1977-2020

**Sweden**, Homer and Sylla (2005), 1850-55; Waldeström (2007), 1856-2000; OECD, 2000-2020.

**Switzerland**, Swiss National Bank, 1837-2004; OECD, 2005-2020.

**United Kingdom**, 1815-2020, Officer (2022).

**United States**, Officer (2022).

## B) Labour Market Regulation

- *Freedom of Domestic Movement* (v2xcl\_dmove). This indicator measures the ability of citizens to move freely across regions within a country and to establish permanent residency where they wish.

- *Freedom from Forced Labour* (v2xcl\_slave). This indicator measures whether adult citizens are free from servitude and other kinds of forced labour.

Both indicators come from the V-Dem database (Coppedge et al., 2022). Their original values have been transformed into index form using the expression

$$I_{ij} = 10 * (V_{ij} - V_{MIN}) / (V_{MAX} - V_{MIN})$$

Where  $V_{ij}$  represents the value of country  $i$  indicator at year  $j$  and  $V_{MAX}$  and  $V_{MIN}$ , its maximum and minimum values.

- *Employment Protection Legislation*. The OECD (2020) aggregate index of employment protection legislation for 1985-2019 has been extended back to 1950 with estimates in Crafts (2006) and Allard (2005). Since Crafts' indices are provided at period averages (1960-64, 1965-72, 1973-79, 1980-87), these average values have been assigned to each year in each period.

Levels for 1960 have been projected backwards to 1950 with Allard's index. It has been transformed into index form using the expression

$$I_{ij} = 10 * (V_{MAX} - V_{ij}) / (V_{MAX} - V_{MIN})$$

Where  $V_{ij}$  represents the value of country  $i$  indicator at year  $j$  and  $V_{MAX}$  and  $V_{MIN}$  its maximum and minimum values, 5 and 0.

### C) Business Regulation

- *Impartial Public Administration*. This indicator comes from the V-Dem database (Coppedge et al., 2022) (v2clrspct).

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