# ARTICLES

# *The Military-Extraction Gap and the Wary Titan: The Fiscal-Sociology of British Defence Policy 1870-1913*

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## 1. Introduction

The recent theory on the costs and benefits of British Imperialism articulated by Lance Davis and Robert Huttenback as well as Patrick O'Brien [2] deserves a good deal of attention as well as scrutiny.

[1] The majority of my thanks goes to JOHN A. HALL, with whom I have written a co-authored article, which came out of our joint research on the national income and military expenditures of the great powers studied here; see J.M. HOBSON and J.A. HALL "Britain's Military Burden, 1870-1913", (unpublished paper), which came out of the McGill Working Paper in Social Behaviour, No. 91-9, (December, 1991). The present article is a fully developed and broader version of these two papers. I would like to thank him for acquiring two grants from McGill and Harvard Universities for me to carry out this research. I would also like to thank the following: Rainer Fremdling, Brian Mitchell, Max-Stephan Schulze, David French and Patrick O'Brien, all of whom provided help and advice. Special thanks go to David Stevenson, Olga Crisp, Peter-Christian Witt, Kaoru Sugihara, Ruggero Ranieri, Avner Offer and Michael Mann.

[2] P.K. O'BRIEN, "The Costs and Benefits of British Imperialism 1846-1914", *Past and Present*, No. 120 (August 1988), pp.163-200. An amended version is to be found in M. Mann (ed.), *The Rise and Decline of the Nation State*, Basil Blackwell, Oxford, 1990, "The Imperial Component in the Decline of the British Economy before 1914", pp. 12-46. Also, O'Brien, "Reply" *Past and Present*, No. 125 (November) 1989, pp. 192-199. L.E. Davis and R.A. Huttenback, *Mammon and the Pursuit of Empire: The Political Economy of British Imperialism* (1986), Cambridge University Press, Cambridge. This was followed by a second edition in 1988. Note that all references made in this article will be made to the first edition, unless otherwise stated. "Mammon" was developed from an earlier set of articles, notably; "The Costs of Empire" in R. Ransom, R. Sutch, and G. Walton (eds), *Explorations in the New Economic History: Essays in Honour of Douglass C. North*

Essentially the argument can be divided into two parts or theses; firstly, that there were few or no economic benefits to be gained from colonisation; and secondly, that the costs of maintaining the empire inhibited much potential economic growth in the motherland[3].

As regards the first thesis there is much to applaud[4]. However interest here lies not with the "benefits" (limited or otherwise), but rather with the "costs" side of the equation[5]. There are in fact two theses within the "costs" side of the theory. Firstly, that **total** British military expenditures were significantly higher than those of her foreign rivals. Secondly, that high British expenditures were a product of defence requirements linked to her imperial commitments. The concern of this article will be to appraise the first part of the "costs" thesis. Thus an examination of the place of military expenditures within the colonial budgets will not be made. Nor will a direct appraisal be made of the amounts of expenditure that Britain made on behalf of the empire.

The argument made is relatively simple. Davis and Huttenback have produced a series of figures which purport to show that the

(1982), Academic Press, New York, pp.41-69; "Public Expenditure and Private Profit: Budgetary Decisions in the British Empire, 1860-1912", *American Economic Review,* Vol. 67, No. 1 (February) 1977, pp. 282-287. Glimpses of the argument can be found in the early work by R.A. Huttenback, *The British Imperial Experience,* Harper and Row, New York, 1966.

[3] Given the "fact" of high military expenditures, it is claimed that approximately 1.5% of national income could have been diverted from "wasteful" colonial pursuits into "productive" investments - O'Brien "Costs and Benefits" pp. 191-194, 198. And Davis and Huttenback argue that had the British forced the subjects in the Empire to assume a burden equal to what they would have paid had they been independent, then British national savings could have been increased by as much as 20% - *Mammon* pp. 304.

[4] See J.M. HOBSON and J.A. HALL "Britain's Military Burden" pp. 10-11. My own thoughts on this hark back to much of what my great-grandfather wrote; see J.A. Hobson *Imperialism: A Study* (1902), London. Sociologically, there is much in the notion that the greatest benefit of imperialism was the acquisition of great power status by the British; see R. Collins, *Weberian Sociological Theory,* CUP, Cambridge 1986, which follows the classic analysis of Max Weber, *Economy and Society,* Vol. 2, 1922/1978 California, Ch. 9. See also the comments by O'Brien "Costs and Benefits" pp. 186-7, and C.P. Kindleberger in his review of *Mammon,* in the *Journal of European Economic History,* Vol. 17, No. 2 (1988) pp. 437-9.

[5] This side of the theory has prompted recent criticism from P. M. Kennedy, "Debate", *Past and Present,* No. 125, (November 1989), pp. 186-192, as well as Avner Offer, "The

British taxpayer was burdened with the highest military budget in the world, in the half-century up to 1914. They state that the fifty three year per capita average of £1.14, began with a level of £0.74 and increased to a substantial £2.04 for the first thirteen years of the twentieth century. This contrasts strikingly, they claim, with an average of a mere £0.85 [France] and £0.77 [Germany], for the period 1900-1912. Furthermore, for the period 1860-1912, these two countries together spent on average £0.62. [6] The major criticism to be made here, is that military expenditures as expressed in **absolute** amounts tell us nothing about the capacity or ability of an economy to pay for its defence. To do this requires the measurement of defence expenditures against national income expressed here as net national product; or the d/NNP ratio. When we calculate the d/NNP ratio (as well as making various other adjustments), it becomes clear that Britain enjoyed the lowest military burden of all the great powers (bar America), and by a considerable margin. However, before going on to make these calculations, it is worth briefly examining the validity of the Davis and Huttenback argument on its own grounds.

## 2. Reappraising the costs of British military spending as estimated in sterling

The first table presents the **national** figures of the military expenditures of the great powers in sterling for the period 1870-1913.

British Empire 1870-1914: A Waste of Money?", *Economic History Review,* (1993, forthcoming). I am grateful to Avner Offer for a preview of this article.

[6] Davis and Huttenback, *Mammon,* Table 5.1 p. 161, and Table 5.2 p. 164. O'Brien, "Reply", *Past and Present,* No. 125, (November, 1989). Table 1, p. 197.

## Table 1
## Military Expenditures of the Great Powers, 1870-1913 (£m)

| Year | Britain | Italy | Germany | Russia | America | Japan | France | Austria |
|---|---|---|---|---|---|---|---|---|
| 1870 | 22.8 | 8.5 | - | 49.2 | 16.3 | 0.5 | 23.9 | 6.3 |
| 1871 | 22.5 | 7.1 | - | 57.8 | 11.3 | 0.7 | 22.0 | 7.0 |
| 1872 | 24.3 | 7.8 | 14.4 | 61.5 | 11.6 | 1.9 | 24.0 | 6.3 |
| 1873 | 23.1 | 8.3 | 16.5 | 65.2 | 14.3 | 2.0 | 25.1 | 6.5 |
| 1874 | 24.4 | 8.6 | 18.6 | 66.2 | 15.0 | 2.8 | 24.8 | 6.6 |
| 1875 | 24.6 | 8.7 | 21.2 | 66.0 | 12.9 | 2.5 | 25.4 | 6.4 |
| 1876 | 25.0 | 8.9 | 20.5 | 67.4 | 11.7 | 6.5 | 27.5 | 7.0 |
| 1877 | 25.5 | 9.9 | 21.7 | 57.1 | 10.7 | 5.6 | 29.1 | 6.9 |
| 1878 | 28.6 | 10.0 | 22.4 | 52.3 | 10.2 | 1.8 | 29.9 | 12.4 |
| 1879 | 30.2 | 9.2 | 21.1 | 52.0 | 11.4 | 2.1 | 29.0 | 8.0 |
| 1880 | 28.4 | 10.2 | 20.9 | 59.5 | 10.6 | 2.3 | 29.8 | 6.8 |
| 1881 | 25.8 | 10.1 | 21.8 | 64.5 | 11.5 | 2.3 | 33.0 | 7.0 |
| 1882 | 27.4 | 11.2 | 21.2 | 56.4 | 12.0 | 2.4 | 34.2 | 8.6 |
| 1883 | 29.8 | 12.7 | 20.8 | 55.3 | 13.2 | 3.6 | 34.7 | 7.3 |
| 1884 | 27.8 | 12.3 | 21.2 | 57.3 | 11.6 | 3.7 | 35.2 | 7.6 |
| 1885 | 30.6 | 13.1 | 21.6 | 59.3 | 12.1 | 3.1 | 36.1 | 7.3 |
| 1886 | 39.4 | 13.4 | 22.7 | 59.9 | 9.9 | 3.3 | 33.9 | 7.3 |
| 1887 | 31.8 | 14.5 | 28.0 | 53.8 | 11.0 | 3.6 | 30.0 | 10.1 |
| 1888 | 30.6 | 17.1 | 30.5 | 57.0 | 11.4 | 3.5 | 28.9 | 9.9 |
| 1889 | 29.0 | 22.2 | 30.8 | 67.7 | 13.5 | 3.7 | 30.3 | 8.9 |
| 1890 | 32.7 | 17.0 | 38.1 | 78.9 | 13.7 | 3.6 | 31.0 | 8.9 |
| 1891 | 33.4 | 15.8 | 35.5 | 78.9 | 15.4 | 4.0 | 37.2 | 8.9 |
| 1892 | 33.2 | 14.5 | 34.5 | 75.3 | 15.6 | 3.5 | 36.9 | 9.3 |
| 1893 | 33.2 | 13.8 | 35.4 | 81.8 | 16.4 | 3.2 | 35.8 | 9.4 |
| 1894 | 33.4 | 14.0 | 36.2 | 85.8 | 17.7 | 10.5 | 37.6 | 9.6 |
| 1895 | 35.4 | 13.0 | 34.8 | 88.3 | 16.6 | 12.3 | 35.9 | 9.9 |
| 1896 | 38.2 | 17.4 | 34.7 | 91.2 | 16.0 | 8.1 | 36.2 | 10.0 |
| 1897 | 40.5 | 14.9 | 37.5 | 40.1 | 17.2 | 11.4 | 37.6 | 11.1 |
| 1898 | 40.2 | 14.5 | 39.8 | 48.7 | 31.0 | 11.5 | 36.5 | 11.7 |
| 1899 | 44.1 | 13.9 | 41.7 | 44.1 | 60.3 | 11.7 | 37.8 | 11.6 |
| 1900 | 69.6 | 14.1 | 43.2 | 44.5 | 39.2 | 13.7 | 41.5 | 11.4 |
| 1901 | 121.0 | 14.8 | 49.3 | 45.2 | 42.1 | 11.0 | 42.5 | 12.2 |
| 1902 | 123.3 | 14.8 | 49.4 | 46.9 | 37.0 | 9.0 | 40.9 | 12.6 |
| 1903 | 100.6 | 14.3 | 47.9 | 49.2 | 41.3 | 15.5 | 40.1 | 12.9 |
| 1904 | 72.2 | 14.4 | 48.6 | 123.0 | 55.1 | 67.8 | 39.5 | 13.3 |
| 1905 | 66.0 | 15.0 | 51.8 | 172.7 | 50.1 | 74.1 | 40.9 | 13.4 |

| Year | Britain | Italy | Germany | Russia | America | Japan | France | Austria |
|---|---|---|---|---|---|---|---|---|
| 1906 | 62.2 | 14.8 | 57.1 | 109.3 | 50.9 | 40.9 | 46.2 | 13.7 |
| 1907 | 59.2 | 16.1 | 66.9 | 71.9 | 50.7 | 24.2 | 45.1 | 14.2 |
| 1908 | 58.5 | 16.7 | 65.1 | 71.3 | 60.4 | 23.9 | 46.2 | 15.5 |
| 1909 | 59.0 | 18.5 | 67.2 | 68.6 | 63.3 | 20.3 | 48.3 | 19.7 |
| 1910 | 63.0 | 19.8 | 68.5 | 68.8 | 64.3 | 21.1 | 50.7 | 17.5 |
| 1911 | 67.8 | 22.9 | 68.1 | 71.0 | 65.2 | 23.2 | 60.8 | 17.0 |
| 1912 | 70.5 | 29.9 | 72.0 | 86.2 | 65.7 | 22.8 | 62.8 | 20.6 |
| 1913 | 72.5 | 39.6 | 93.4 | 101.7 | 68.9 | 22.0 | 72.0 | 25.0 |
| Average (1870-1913) | 45.0 | 14.5 | 38.4 | 68.8 | 27.7 | 12.0 | 37.0 | 10.8 |

Sources: See Appendices 1 and 2. Note that the German average figure is 1872-1913

These figures show that the British national spending figures were surpassed in many years by her rivals. Up to about 1897 French and British spending levels were very similar, though diverging thereafter. Germany had caught Britain by 1888, and after 1906, had overtaken her Liberal counterpart. Russian levels are by far the highest, and require further explanation (to be considered shortly). Furthermore, whilst American levels were low up to 1897, thereafter, with her entry on to the world stage, she rapidly caught up and more or less matched Britain after 1908. The low spenders, when measured in sterling, were unequivocally Italy, Japan and Austria. Nevertheless, Davis and Huttenback claimed that British **per capita** levels were the highest in the world in this period. Table 2 presents estimates of per capita spending levels in sterling, in quinquennial averages.

Table 2

Per Capita Military Expenditure in Sterling Equivalent (£ )

| Year | Britain | Italy | Germany | Russia | U.S. | Japan | France | Austria | G.P Average* |
|---|---|---|---|---|---|---|---|---|---|
| 1870-4 | 0.73 | 0.30 | 0.40** | 0.69 | 0.33 | 0.05 | 0.65 | 0.32 | 0.39 |
| 1875-9 | 0.80 | 0.34 | 0.49 | 0.64 | 0.24 | 0.10 | 0.76 | 0.38 | 0.42 |
| 1880-4 | 0.79 | 0.40 | 0.46 | 0.57 | 0.22 | 0.08 | 0.88 | 0.34 | 0.42 |
| 1885-9 | 0.88 | 0.54 | 0.56 | 0.53 | 0.20 | 0.09 | 0.83 | 0.38 | 0.45 |
| 1890-4 | 0.87 | 0.49 | 0.71 | 0.67 | 0.24 | 0.12 | 0.93 | 0.38 | 0.51 |
| 1895-9 | 0.99 | 0.46 | 0.70 | 0.50 | 0.39 | 0.26 | 0.95 | 0.43 | 0.53 |
| 1900-4 | 2.33 | 0.44 | 0.83 | 0.45 | 0.54 | 0.51 | 1.05 | 0.47 | 0.61 |
| 1905-9 | 1.39 | 0.48 | 0.99 | 0.67 | 0.63 | 0.77 | 1.15 | 0.56 | 0.75 |
| 1910-13 | 1.51 | 0.88 | 1.15 | 0.49 | 0.70 | 0.44 | 1.55 | 0.70 | 0.83 |
| 1870-1913 | 1.18 | 0.47 | 0.74** | 0.57 | 0.42 | 0.29 | 0.97 | 0.45 | 0.54 |
| 1900-1912 | 1.76 | 0.52 | 0.88 | 0.53 | 0.62 | 0.60 | 1.19 | 0.55 | 0.70 |
| 1870-1913 | 100 | 40 | 63 | 49 | 36 | 25 | 82 | 38 | 46 |
| 1900-1912 | 100 | 29 | 50 | 30 | 35 | 34 | 67 | 31 | 40 |

* Great Power Average = All Powers except Britain
** Omits the years 1870 & 1871

*Sources:* For military expenditures see Appendix 1. For currency conversion rates and population sources, see Appendix 2. Note that my "G.P." sector involves only the seven great powers (with Britain excluded). This contrasts significantly with the D&H concept of the "Foreign Developed" sector (See *Mammon,* Appendix 1.3 pp. 29). Because they have included various powers which spent only very low amounts on defence, the differential vis-à-vis Britain will be much larger than that derived from the concept of the GP average.

This table, upon which the Davis and Huttenback "costs" thesis rests, raises several problems. The first problematic issue is that of the treatment of the British figures. Davis and Huttenback omitted the Irish population figures when calculating per capita expenditures[7]. Secondly, whilst the **per capita** British spending figures are indeed the highest in the world, they are nevertheless not as high in relation to the other great powers as Davis and Huttenback would have us believe. Between 1872-1913 German levels are estimated here to have been 63% that of the British compared to the Davis and Huttenback figure of approximately 54% (1860-1912). Moreover under the present estimates, France is 82%

[7] *Mammon,* pp. 143.

that of the British (1870-1913) compared to a mere 54% (1860-1912) under the Davis and Huttenback scenario. After 1900, the German levels are approximately 50% that of the British rather than 37%, whilst the French were 67% rather than 41%. My GP average relative to Britain is 46% (1870-1913) and 40% (1900-12) compared to the Foreign Developed sector's expenditure level of 32% (1860-1912) and 28% (1900-12)[8]. Moreover, if we include Britain within the overall GP average, we find that the latter is 53% that of the former (1870-1913) and 56% (1900-12). Nevertheless, Britain dwarfed Italy, Russia, America, Japan, and Austria, (as did Germany and France). Thirdly, Davis and Huttenback have failed to provide a clear account of the sources of their data. I suspect that they may be substantially informed by the British Parliamentary Papers[9]. If this is the case, they may well be "Mickey Mouse numbers".[10] Fourthly, there is the problem of currency conversion (a problem which returns us to the treatment of the Russian expenditures as expressed in sterling).

There are two problems to emerge in the use of pre-war parities and currency exchange rates. Firstly, Russia suffered from significant swings in the rouble prior to the adoption of the gold standard. It is therefore important to use year-by-year exchange rates until 1897. Indeed Bidwell gives an exchange rate of 6.3 Rb to the £ for 1870 (compared to a parity of 9.45), though as my appendix 2 shows, this is still an exaggeration. It is highly unlikely that Davis and Huttenback have used yearly conversion rates for Russia. Note that it is the use of the annual exchange rate series (1870-1897) that leads to the very high Russian military expenditures when expressed in sterling.

[8] See *Mammon,* Table 5.2, p. 164.

[9] In their appendix 4.1, they quote the "annual British compilation of foreign statistics" as one of their sources, *Mammon,* pp. 143-144.

[10] O'Brien claimed in his reply to Paul Kennedy that the Davis and Huttenback figures were not only sound but the most recent, "Reply" p. 196. If my hunch is correct, it is interesting to note that Platt has raised questions about the accuracy of the "Abstract for Foreign Countries" found in the British Parliamentary Papers, see D.C.M. Platt, *Mickey Mouse Numbers in World History: The Short View,* Macmillan, London (1989), pp. 28-30.

However a second and more serious problem lies with the use of the exchange rate as a conceptual tool for converting all currencies into that of one (namely, sterling).

The use of trade-based exchange rates for conversion into one standard currency is a highly problematic exercise. Emile Benoit and Harold Lubell point out that prices may bear some relation to real costs only under conditions of free internal and external markets, and in a world of freely fluctuating exchange rates [11]. For the period under consideration here, most countries were attached to a regime of fixed exchange rates and moderate protection. Moreover, those countries which joined the gold standard late, enjoyed some of the highest rates of tariff protection. In addition, most of these countries' total production comprised internationally traded goods and services. Thus in sum, it is necessary to produce a set of purchasing power parities (PPP's henceforth). Without such a measure, comparison of national military expenditures in one currency, as has been done by Davis and Huttenback (as well as here, in tables 1 and 2), is problematic.

## 3. Defining the concept of the "real" military burden: An alternative estimation procedure

So far military "costs" have been examined in terms of **absolute** spending figures (national/per capita). Davis and Huttenback constantly refer to the notion of the tax burden through using such absolute figures. According to such figures, it is clear that on a per capita (though not national) basis, Britain spent the most of all the Great Powers. But these figures tell us nothing about the average taxpayer's ability to pay, nor the size of the economy that is consumed in the process. Consider the following two statements: (1) X pays

[11] "The World Burden of National Defence" in E. Benoit (ed), *Disarmament and World Economic Interdependence,* Universitetsförlaget, Oslo (1967) p. 38. E. Benoit and H. Lubell, "World Defence Expenditures", *Journal of Peace Research,* Vol. 2, 1960, pp. 97-113. See also G. Kennedy, *Defence Economics,* pp.52-5; R. Fremdling, "Productivity Comparison between Britain and Germany, 1855-1913", *Scandinavian Economic History Review,* Vol. 39, No. 1, 1991 pp. 33.

twice as much as Y on taxes for defence; (2) Y's income is half that of X. Davis and Huttenback/Patrick O'Brien have analysed the various per capita tax burdens on the basis of statement 1. This would be acceptable if all the economies concerned were at exactly the same state of advancement. However, in reality this was not the case. Indeed, British national income throughout most of this period was (bar America) the highest in the world. On a per capita basis, in relation to her continental rivals even as late as 1913, British per capita income was very approximately 131% that of France, 153% [Germany], 183% [Austria], 225% [Italy], a staggering 421% [Russia], and 598% [Japan] [12]. Thus to understand the "real" military burden, we must take statement 2 into account, which involves measuring defence expenditures against national income, (the d/NNP ratio). Such a calculation would tell us more about the real burden of national taxpayers, though with four important qualifications.

Firstly, the construction of national income figures is clearly a problematic exercise, particularly on a comparative basis [13]. Nevertheless, given the many problems of estimation procedure, most studies agree that defence expenditures measured as a proportion of national income "is the least unsatisfactory measure of a country's defence burden" [14]. Thus although it is not possible to gauge the actual margins of error of the national income data used here, I have however estimated the required margins of error in the NNP data, which must hold in order to validate the Davis and Huttenback thesis (see section 6).

[12] These figures were calculated from Appendix 1&2. The income figures were converted into £ using the Pre-War parity (see appendix 2). These of course are only approximate, given that I have used a trade exchange rate, and therefore serve as a useful index.
[13] A point made by Patrick O'Brien "Reply" pp. 195-196. This is implied by Simon Kuznets who conceded that his estimates of U.S national income were probably subject to an approximate 10% margin of error, though he did go on to state that "were we able to ascertain the sign and size of the error for any given estimates, we could, of course, correct for this error, and there would be no need to retain it", Kuznets, *National Income and its Composition, 1919-1938,* NBER, New York, 1954, pp.535. Unfortunately there is little good discussion of estimation problems in the literature. One notable exception is O. Morgenstern, *On the Accuracy of Economic Observations,* Princeton University Press, NJ, 1963, pp. 242-282.
[14] G. Kennedy, *Defence Economics,* 1983, p. 36.

Secondly, as Gavin Kennedy points out, the d/NNP method of burden estimation does not capture the true resource cost of defence because it fails to take into account the difference between the use of the conscript and the volunteer army[15]. I have therefore attempted to measure the differential, (see section 8).

Thirdly, total military spending includes various extraordinary expenditures, which were financed through loans, but **omits** interest paid out on these military-induced loans. Thus on this basis, these figures would exaggerate the real **tax** burden. To measure this would require taking only those military expenditures that were financed from the ordinary budget (which were funded through taxes). There are essentially two reasons why this is not my preferred option. Firstly, taking only ordinary military expenditures into account would lead to a partial derivation of the real military burden. In addition, the debt interest incurred on loans taken out to finance the extraordinary expenditures perhaps should be included, since these were financed for the most part through the ordinary budget. This is an extremely complicated exercise requiring such data as the length of such loans and their percentage rates (which differ within the internal accounts of each budget), as well as data showing what proportion of the national debt was derived from military sources. This is simply too difficult for most of these countries. Secondly, however, in addition to the attempt to come to a more satisfactory estimate of the "ability to pay" (which in any case does not feature at all in the Davis and Huttenback data), it is important to understand the burden in terms of what the economy could bear. This is done only by calculating what proportion of national income was consumed by total military expenditures (ordinary plus extraordinary though interest repayments are not included given the quantification difficulties expressed above). Taking ordinary military expenditures only would not do this. Even so, this method will paint a far more accurate picture of the relative national tax burdens than would the Davis and Huttenback method. It will enable the British "real" military burden to be situated

[15] G. Kennedy, *Ibid.* A point also made by O'Brien, "Costs and Benefits", pp. 189-190.

in the context of that of the Great Powers, from which I shall be able to estimate a differential (expressed as a percentage of British national income). This differential will then be converted into sterling for each year, to show how much less (or more) the British spent in relation to her foreign counterparts, (see section 5). How the "gap" could have been financed (through loans or taxes, or a combination of the two) is largely irrelevant to my argument.

Finally the term "burden" must be more clearly specified. The term is not meant to contain the Cobdenite assumption that military expenditures stifle economic growth. This assumption has been brought into question, particularly within the recently emerging discipline of "defence economics" [16]. Clearly a good deal of research is required before the enigmatic relationship of defence expenditure, taxation and economic growth is finally understood [17]. Thus to avoid confusion, the concept of the military "burden" will be used interchangeably with the terms "military index" and "military extraction ratio".

The premise that the real military burden must take into account relative spending power is acknowledged at various points by Patrick O'Brien. Thus he states that national income figures are now

[16] For an overview, see especially G. Kennedy, *Defence Economics*; K. Hartley, *The Economics of Defence Policy,* Brassey's, London (1991). For those authors who envisage a positive relationship between military expenditures and economic growth (though under certain conditions) see E. Benoit, *Defence and Economic Growth in Developing Countries* (1973), Lexington Books, MASS; also G. Kennedy, *The Military in the Third World* (1974), Duckworth, London. In contrast, for those authors who envisage a negative relationship between military expenditures and economic growth see P.M. Kennedy, *The Rise and Fall of the Great Powers,* Unwin Hyman, London (1988), pp. 483-540; S. Deger and R. Smith, "Military Expenditure, Spin-off and Economic Development", *Journal of Development Economics* (1983), Vol. 13, pp. 67-83; F. Faini, P. Amez, L. Taylor "Defence Spending, Economic Structure and Growth: Evidence among Countries and over Time", *Economic Development and Cultural Change* (1984), Vol. 32, pp. 487-498; R. Degrasse, *Military Expansion, Economic Decline* (1985), Armonk, NY.

[17] Not least, as Bruce Russett puts it, "a full investigation of the degree and circumstances of various trade-offs would require a complex model of the determinants of investment, only one of which is military spending". Russett "Defence Expenditures and National Well-being", *The American Political Science Review,* (December, 1982), Vol. 76, No. 4, p. 768.

becoming available, implying that such an analysis may be possible [18]. Indeed, he went on to concede that since British incomes were above other Europeans, their relative tax burdens would certainly not have been as high as Davis and Huttenback have stated [19]. Furthermore, in his reply to Paul Kennedy, he conducted an estimate on a very crude basis (as he indeed admitted) of the "real military burden". Thus he presented a table, using Paul Bairoch's national income data (GNP), from which he generated a set of indexes which were measured against indexes of military expenditures [20]. From here it was but a short step to provide a rank order of the different national burdens. Here he showed that Britain was above Germany, Russia and Austria-Hungary (but below France). In general he has concluded that "on any plausible hypothesis about the shares of income appropriated as taxes and used to defray expenditures on defence, Britain would remain right at the top of international league tables" [21]. However, he then went on to argue that such a calculation is not feasible given that there are no unambiguous conceptual notions nor valid statistical estimates of national income [22]. It is quite true that there are various statistical problems in the production of such data (as was noted earlier). Nevertheless it is interesting to note that Patrick O'Brien himself relied on this type of formula when he calculated the relative (real) tax burdens of British and French taxpayers for the period 1715-1812 in his classic 1976 article. [23] Here he used the measure of commodity output rather than national

[18] O'Brien, "Costs and Benefits", p. 188.
[19] O'Brien, *Ibid.*
[20] O'Brien, "Reply", Table 2, p. 197.
[21] O'Brien, "Costs and Benefits", pp. 188. It is interesting to note that there is no discussion of this formula by Davis and Huttenback. Thus they refer time and again to the tax burden as a mere expression of absolute spending figures - see especially *Mammon,* pp. 221-229. However, where it suits them they quote British military expenditures as a proportion of national income - see especially *Mammon* (2nd edition) pp. 112, 129, 277. See also Davis and Huttenback, "Costs of Empire", p. 42.
[22] O'Brien, "Reply", p. 196. Also p. 195.
[23] P. Mathias & P.K. O'Brien, "Taxation in Britain and France, 1715-1810. A Comparison of the Social and Economic Incidence of Taxes collected for the Central Governments", *Journal of European Economic History*, Vol. 5, No. 3 (1976), pp. 601-650.

income, though it served exactly the same purpose. Furthermore, he produced figures (again of commodity output) for Britain and France from 1780-1914 in another important work.[24] Whilst a good deal of care went into deriving these figures, it is implicitly conceded that such figures are not only derivable, but are important. Furthermore, neither of these two important works would have been developed without the use of a (proxy) income data series. In this article, national income figures will be used which go back only as far as 1870. Clearly these are less problematic than the equivalent data for the eighteenth century. The problem now becomes one of data selection, given that such figures can vary for each country.

## 4. Specifying the data set

One of the most widely-quoted sets of income data is that produced by Paul Bairoch,[25] which, as was noted above, provided the crude estimate made by O'Brien in his reply to Paul Kennedy. These data have been standardized into a single currency; that of constant 1960 U.S. $. There are however several problems with such figures. Firstly, there is the major problem of currency conversion. The use of market exchange rates is inadequate. This is because $1 (1960) will buy a different quantity and quality of commodities in the different national baskets of goods. What is needed is a purchasing power parity. Bairoch however did not use PPPs, but rather used market exchange rates with some "ad hoc adjustments"[26].

Indeed in Bairoch's own words, his adjustment for differences in

[24] P.K. O'Brien and C. Keyder, *Economic Growth in Britain and France 1780-1914: Two Paths to the Twentieth Century,* George Allen and Unwin, London (1978). In a more recent work, O'Brien again calculates the real tax burden in Britain for the period 1665-1815, see "The Political Economy of British Taxation, 1660-1815", *Economic History Review,* 2nd Series, Vol. 41, No. 1, 1988, Table 2, pp. 3. Also pp. 5-7.
[25] P.A. Bairoch, "Europe's Gross National Product: 1800-1975", *Journal of European Economic History,* Vol. 5, No. 2, (1976), pp. 273-340.
[26] N.F.R. Crafts, "New Estimates of G.N.P. in Europe", *Explorations in Economic History,* Vol. 20, p. 388.

national price structures is "not only very crude", but is "also in certain respects arbitrary" [27]. Since this data set was compiled, various series have been produced using the OECD purchasing power parities. Here a "representative" basket of goods is selected and converted into constant US$ [usually 1970], [28] and more recently into US$ [1980] [29]. The base year parity is then extrapolated backwards using secondary sources of national income growth rates. Although this is undoubtedly an improvement on the Bairoch procedure, this method produces problems of its own [30]. Because the margin of error becomes greater the further back these figures are extrapolated, the late nineteenth-century data will be subject to distortion. In addition, referring to specifically Britain and France, O'Brien states categorically that an exercise employing OECD methods would not be feasible for the nineteenth century because available estimates for national output simply cannot be broken down into composite commodities. [31] This would be true of all the countries of Europe. To sum up, when deriving national income on a comparative basis in one standard currency, PPPs are essential. This rules out the Bairoch figures. However, the use of PPPs mainly across

[27] See Bairoch, "Europe's GNP", pp. 275, 318. In any case, as with the studies based on purchasing power parities, the national income figures which are extrapolated backwards are already from secondary sources. Hence at the very least, the figures presented in appendix 3 will be free of certain distortions generated by the OECD figures, as well as Bairoch's own adjustments.

[28] N.F.R. Crafts, "New Estimates", pp. 387-401. N.F.R. Crafts, "Patterns of Development in Nineteenth Century Europe", *Oxford Economic Papers,* Vol. 36, No. 3 (November), 1984, pp.438-458. I.B. Kravis et al., *A System of International Comparisons of Gross Product and Purchasing Power,* Johns Hopkins University Press, World Bank (1975). I. B. Kravis, "Real G.D.P. per capita for more than one hundred countries", *Economic Journal,* Vol. 88 (1978), pp. 215-242. I. B. Kravis, *World Product and Income,* Johns Hopkins University Press, Baltimore (1982). A. Maddison, *Phases of Capitalist Development,* Oxford University Press, Oxford (1982).

[29] A. Maddison, *The World Economy in the Twentieth Century,* OECD, Paris (1989).

[30] Firstly, Kravis used a basket of goods which did not evaluate the cost of living in the nineteenth century. Thus the basket of goods should change over time. Secondly, these estimates have been derived for both first and third world countries. This would make the choice of the basket of goods highly problematic given the considerable divergence in consumption patterns. Furthermore, as O'Brien and Keyder point out, PPP's are problematic to calculate because statisticians are compelled to make assumptions about the similarity of commodities produced in different countries - *Economic Growth,* pp. 34. Finally, through time, there have been changes in the relations between rich and poor

long time periods, can create problematic data sets. This rather lengthy criticism of the "generalist" income series produced by various authors is useful here for shedding light not only on some of the limitations in the current literature, but also for appraising the figures reproduced by Kennedy in his critique of Patrick O'Brien.

In his debate with Patrick O'Brien conducted in *Past and Present* No. 125, Kennedy attempted to show the "real" military burden of Britain, France, Germany, Austria-Hungary and Italy for the year 1914. Here he reproduced the figures originally quoted by A.J.P. Taylor, who in turn used the figures of Quincy Wright. In turn, Wright used the national income data quoted in Kuznets[32]. These data are as follows; Russia's burden was the highest on 6.3 followed by Austria-Hungary (6.1), France (4.8), Germany (4.6), Italy (3.5) and finally Britain (3.4). He then reiterates Taylor's conclusion that "Britain found it easiest to be a great power, Russia the most difficult"[33]. There are several problems with these figures. Firstly, Kuznets did not use PPP's but rather resorted to using market exchange rates for conversion into current US $. Secondly, the data

countries, which would alter the relative prices between them. Thus the ratio of prices between the goods within the chosen basket should change through time — see Vera Zamagni, *Dalla periferia al centro. La seconda rinascita economica dell'Italia 1861-1981,* Società editrice Il Mulino, Bologna, (1990), pp. 59-60. Also K. Ohkawa and M. Shinohara, *Patterns of Japanese Economic Development: A Quantitative Analysis,* Yale University Press, London, 1979, pp. 6-8.

[31] *Economic Growth,* pp. 35. For further discussion of problems of deriving national income in a single currency, see R. Tilly, "Per Capita Income and Productivity as Indices of Development and Welfare. Some comments on Kuznetsian Economic History" in R. Fremdling and P. K. O'Brien, *Productivity in the Economies of Europe,* Klett-Cotta, Stuttgart (1983), pp. 30-57.

[32] P.M. Kennedy, "Debate", pp. 190-191. A.J.P. Taylor, *The Struggle for Mastery in Europe 1848-1918,* Clarendon Press, Oxford, (1954), Table 6, pp. XXIX. Q. Wright, *A Study of War,* University of Chicago Press, Chicago (1965, 2nd edition), pp. 670-671. S. Kuznets National Income", *Encyclopedia of the Social Sciences,* Vol. 11 (1933), Table 1 p. 206.

[33] P.M. Kennedy, "Debate", *Ibid.* Note that at first glance Kennedy's attack on O'Brien seems surprising, given his advocacy of the theory of imperial overstretch as outlined in *The Rise and Fall of the Great Powers.* However, a closer look reveals a different conclusion. Indeed, in keeping with his critique of O'Brien, he stated that "...although Britain was one of the heaviest spenders on defence prior to 1914, it needed to allocate a smaller share of its national income to that purpose than any other great power in Europe", *The Rise and Fall of the Great Powers,* p. 230. Also pp. 213. Note also that

used by Kuznets are now out of date[34]. Finally, for most of these countries Wright set 1913 national income against 1914 military expenditures. In a period of both large national income and Great Power military expenditure growth, this will tend to skew the burdens upwards.

These figures have only been produced for 1914. What is required is a series of estimates for all the Great Powers going back to the period preceding the "high tide of imperialism". 1870 has been chosen as the starting year, though Japan, Russia and Germany all begin later. The reasons for this need to be briefly examined. German data begin in 1872 because this was the first full fiscal year of the newly-found empire. Japanese data begin in 1885, mainly because of the paucity of available data prior to that date. Thus Ohkawa and Rosovsky[35] state that "... the available quantitative information is such that it is most difficult to establish aggregate economic growth rates before the middle of the 1880s". Curiously, in an earlier work Ohkawa[36] argued that "... it is only reasonable to start our enquiry of economic growth from somewhere in the latter part of the 1870s". To

elsewhere he has concluded that "the most remarkable feature of the post 1815 Pax Britannica was its cheapness", *The Realities behind Diplomacy: Background Influences on British External Policy 1865-1980*, Fontana, London (reprinted 1989), p. 32; see also *The Rise and Fall of British Naval Mastery*, Macmillan, London (1983), Ch.7. Thus contrary to popular (mis)understanding, Kennedy never used the theory of imperial overstretch to explain Britain's relative economic decline in the period 1870-1913. Indeed, he argued that it was the primary causal factor of Britain's relative economic decline in the first place which led to her relative military decline. For a similar position see also K.A. Rasler and W.R. Thompson, "Relative Decline and the Overconsumption-Underinvestment Hypothesis", *International Studies Quarterly* (1991), Vol. 35, pp. 273-294.

[34] One glaring mistake came about through the use of the Vladimir Kats national income data for Russia. These like the Prokopovic figures were produced using the Marxian concept of **net material product**. Following Marx and the classical liberal economists, Kats omitted income derived from services, which led to a serious underestimation of national income, and hence led to a substantial overestimation of the military burden. (This of course is something of an irony, given the implication of Karl Marx's attack on Smith's differentiation between unproductive and productive labour, where Marx argued that services could fall into the latter category). The Fellner data for Hungary, whilst a considerable improvement on those data sets derived under the net material product procedure (Berend and Ránki, Katus), nevertheless are based mainly on the 1911 year, though Wright has used this to calculate the 1914 military burden, which would lead to an exaggeration.

be on the safe side, I have chosen 1885 as the starting year. Finally no income statistics exist for Russia prior to 1885 on a yearly basis, though there are the growth rate data produced by Goldsmith[37]. However in his authoritative study on Russian national income, Paul Gregory begins his data set in 1885 and does not extrapolate back mainly because "... the available statistical material appears too weak to support such an effort..."[38]. I have decided that extrapolating backwards from 1885 to 1870 (especially through the use of average growth rates based on the period 1860-1885) is not a worthwhile exercise. Rather than use any of the generalist series, I shall instead use the secondary data specific to each country (produced therefore in their respective national currencies). This will avoid the problems inherent within the standardised currency data projects. Where possible I have tried to use data which would produce the worst-case scenario for my argument (see footnote 40). I have chosen to standardize all income data to one measure: **net national product at factor cost**[39] (national income). Where the figures are not available in this form, they have been converted[40]. Without further ado, below are presented the estimates of the "real" military burden of the various Great Powers.

[35] K. Ohkawa and H. Rosovsky, *Japanese Economic Growth: Trend Acceleration in the Twentieth Century* (1973), p. 9. Also K. Ohkawa and M. Shinohara, *Patterns of Japanese Economic Development,* p. 12.

[36] Tsuru and Ohkawa "Long-Term Changes in the National Product of Japan since 1878" in M. Gilbert (ed), *Income and Wealth: Series 3* (1953), Bowes and Bowes, Cambridge, p. 20.

[37] R. Goldsmith, "The Economic Growth of Tsarist Russia, 1860-1913", *Economic Development and Cultural Change,* Vol. 9, No. 3 (April, 1961), pp. 441-475.

[38] Gregory, *Russian National Income* pp. 195. Note also that Gregory has argued that the Goldsmith growth rates are likely to be too low for 1860-1885, see *Ibid* pp. 75-76.

[39] Paul Gregory, has examined carefully the derivation of 4 of the 8 data sets used here, notably, Kuznets, Hoffmann, Feinstein, Ohkawa and Rosovsky, and concluded that they have used similar estimation procedures to those used by himself. See Gregory, *Russian National Income 1885-1913,* Cambridge University Press, Cambridge, 1982, pp. 153. This happily reduces some of the problems encountered when conducting crossnational comparisons. One qualification should be made. As is pointed out in appendix 3, military expenditures have been added to the Kuznets NNP figures, in order to make them more comparable with the other data series.

[40] This has been discussed in detail elsewhere; see Hobson and Hall, "Britain's Military Burden", Appendix 2.

## 5 The British "real" military burden in comparative perspective

Table 3

Comparative Real Military Burdens (d/NNP) of the Great Powers, 1870-1913

| Year | Britain | Italy | Germany | Russia | America | Japan | France | Austria |
|---|---|---|---|---|---|---|---|---|
| 1870 | 2.4 | 2.6 | - | - | 1.3 | - | 3.2 | 5.1 |
| 1871 | 2.2 | 2.1 | - | - | 0.9 | - | 2.9 | 5.0 |
| 1872 | 2.3 | 2.1 | 2.3 | - | 0.9 | - | 3.0 | 4.4 |
| 1873 | 2.0 | 1.9 | 2.4 | - | 1.0 | - | 3.1 | 4.8 |
| 1874 | 2.2 | 2.1 | 2.6 | - | 1.0 | - | 3.0 | 4.5 |
| 1875 | 2.2 | 2.4 | 3.0 | - | 0.9 | - | 3.1 | 4.3 |
| 1876 | 2.3 | 2.4 | 2.9 | - | 0.8 | - | 3.4 | 4.5 |
| 1877 | 2.3 | 2.5 | 3.1 | - | 0.6 | - | 3.6 | 4.2 |
| 1878 | 2.7 | 2.7 | 3.3 | - | 0.6 | - | 3.9 | 7.0 |
| 1879 | 2.9 | 2.5 | 3.1 | - | 0.7 | - | 3.8 | 4.7 |
| 1880 | 2.6 | 2.6 | 3.0 | - | 0.6 | - | 3.7 | 3.8 |
| 1881 | 2.3 | 2.9 | 3.0 | - | 0.7 | - | 3.8 | 3.7 |
| 1882 | 2.4 | 3.0 | 2.9 | - | 0.6 | - | 3.8 | 4.5 |
| 1883 | 2.6 | 3.6 | 2.7 | - | 0.6 | - | 4.0 | 3.6 |
| 1884 | 2.5 | 3.5 | 2.7 | - | 0.5 | - | 4.3 | 3.6 |
| 1885 | 2.7 | 3.6 | 2.8 | 4.1 | 0.6 | 2.4 | 4.6 | 3.4 |
| 1886 | 3.5 | 3.5 | 2.9 | 4.6 | 0.5 | 2.9 | 4.3 | 3.2 |
| 1887 | 2.7 | 4.0 | 3.3 | 3.7 | 0.5 | 3.2 | 3.8 | 4.2 |
| 1888 | 2.4 | 4.9 | 3.5 | 3.6 | 0.5 | 3.3 | 3.6 | 4.1 |
| 1889 | 2.1 | 5.9 | 3.3 | 4.3 | 0.6 | 3.1 | 3.7 | 3.6 |
| 1890 | 2.4 | 4.2 | 3.8 | 4.4 | 0.6 | 2.0 | 3.7 | 3.2 |
| 1891 | 2.4 | 3.9 | 3.5 | 4.9 | 0.7 | 2.7 | 4.3 | 3.1 |
| 1892 | 2.5 | 3.9 | 3.3 | 4.4 | 0.6 | 2.5 | 4.2 | 3.1 |
| 1893 | 2.5 | 3.6 | 3.4 | 4.4 | 0.7 | 2.6 | 4.2 | 3.1 |
| 1894 | 2.4 | 3.8 | 3.5 | 4.3 | 0.7 | 10.8 | 4.4 | 2.9 |
| 1895 | 2.4 | 3.3 | 3.3 | 4.8 | 0.7 | 9.0 | 4.3 | 2.8 |
| 1896 | 2.6 | 4.5 | 3.1 | 4.5 | 0.7 | 5.6 | 4.4 | 2.8 |
| 1897 | 2.6 | 3.9 | 3.1 | 4.4 | 0.6 | 6.9 | 4.3 | 3.0 |
| 1898 | 2.5 | 3.4 | 3.1 | 4.8 | 1.0 | 5.4 | 3.8 | 2.9 |
| 1899 | 2.6 | 3.3 | 3.1 | 3.9 | 1.9 | 6.3 | 3.9 | 2.7 |
| 1900 | 4.0 | 3.1 | 3.1 | 4.0 | 1.3 | 6.5 | 4.2 | 2.7 |
| 1901 | 7.0 | 3.2 | 3.6 | 3.9 | 1.4 | 5.2 | 4.3 | 2.7 |
| 1902 | 7.1 | 3.3 | 3.5 | 3.7 | 0.8 | 4.4 | 4.3 | 2.7 |
| 1903 | 5.9 | 2.9 | 3.2 | 4.1 | 0.9 | 6.5 | 4.0 | 2.8 |
| 1904 | 4.2 | 3.0 | 3.1 | 9.2 | 1.3 | 27.9 | 3.9 | 2.8 |
| 1905 | 3.7 | 2.9 | 3.1 | 13.8 | 1.1 | 30.6 | 3.9 | 2.5 |
| 1906 | 3.3 | 2.7 | 3.2 | 8.7 | 1.2 | 14.5 | 4.2 | 2.3 |
| 1907 | 3.0 | 2.7 | 3.5 | 5.4 | 0.9 | 7.6 | 3.8 | 2.2 |
| 1908 | 3.1 | 2.8 | 3.4 | 4.7 | 1.1 | 7.4 | 4.0 | 2.4 |

| Year | Britain | Italy | Germany | Russia | America | Japan | France | Austria |
|---|---|---|---|---|---|---|---|---|
| 1909 | 3.1 | 2.9 | 3.5 | 4.3 | 1.1 | 6.4 | 4.1 | 3.0 |
| 1910 | 3.2 | 3.0 | 3.3 | 4.0 | 1.1 | 6.7 | 4.0 | 2.6 |
| 1911 | 3.3 | 3.3 | 3.1 | 4.3 | 1.2 | 6.2 | 4.5 | 2.4 |
| 1912 | 3.2 | 4.0 | 3.1 | 4.5 | 0.9 | 5.5 | 4.2 | 2.6 |
| 1913 | 3.2 | 5.1 | 3.9 | 5.1 | 1.0 | 5.1 | 4.8 | 3.2 |
| 1885-1913 | 3.4 | - | - | 5.1 | - | 8.2 | - | - |
| 1870-1913 | 3.1 | 3.3 | 3.2 | - | 0.9 | - | 4.0 | 3.1 |

*Sources:* See Appendices 1 and 3

## Table 4

Comparative Real Military Burdens (d/NNP) of the Great Powers, 1870-1913

| Year | Britain | Italy | Germany | Russia | America | Japan | France | Austria |
|---|---|---|---|---|---|---|---|---|
| 1870 | 100 | 106 | - | - | 52 | - | 132 | 208 |
| 1871 | 100 | 96 | - | - | 40 | - | 129 | 224 |
| 1872 | 100 | 92 | 102 | - | 40 | - | 132 | 196 |
| 1873 | 100 | 97 | 120 | - | 50 | - | 157 | 237 |
| 1874 | 100 | 96 | 119 | - | 48 | - | 138 | 206 |
| 1875 | 100 | 110 | 138 | - | 41 | - | 141 | 195 |
| 1876 | 100 | 108 | 126 | - | 36 | - | 150 | 200 |
| 1877 | 100 | 106 | 133 | - | 26 | - | 153 | 177 |
| 1878 | 100 | 99 | 121 | - | 22 | - | 144 | 259 |
| 1879 | 100 | 85 | 107 | - | 22 | - | 130 | 160 |
| 1880 | 100 | 99 | 112 | - | 23 | - | 140 | 145 |
| 1881 | 100 | 125 | 132 | - | 29 | - | 165 | 161 |
| 1882 | 100 | 127 | 124 | - | 24 | - | 161 | 193 |
| 1883 | 100 | 139 | 106 | - | 24 | - | 156 | 141 |
| 1884 | 100 | 142 | 111 | - | 22 | - | 175 | 144 |
| 1885 | 100 | 132 | 101 | 151 | 21 | 89 | 166 | 125 |
| 1886 | 100 | 102 | 82 | 134 | 13 | 84 | 125 | 93 |
| 1887 | 100 | 150 | 124 | 138 | 18 | 118 | 142 | 157 |
| 1888 | 100 | 201 | 142 | 147 | 21 | 134 | 147 | 170 |
| 1889 | 100 | 272 | 153 | 198 | 28 | 145 | 174 | 168 |
| 1890 | 100 | 179 | 160 | 188 | 25 | 84 | 156 | 136 |
| 1891 | 100 | 159 | 146 | 202 | 28 | 109 | 178 | 126 |
| 1892 | 100 | 158 | 135 | 178 | 26 | 102 | 170 | 123 |
| 1893 | 100 | 146 | 138 | 176 | 27 | 105 | 169 | 126 |
| 1894 | 100 | 160 | 147 | 181 | 31 | 461 | 188 | 122 |
| 1895 | 100 | 134 | 133 | 196 | 28 | 369 | 178 | 115 |
| 1896 | 100 | 173 | 120 | 174 | 25 | 219 | 171 | 107 |
| 1897 | 100 | 149 | 118 | 169 | 21 | 261 | 163 | 114 |
| 1898 | 100 | 136 | 124 | 195 | 40 | 219 | 155 | 115 |

| Year | Britain | Italy | Germany | Russia | America | Japan | France | Austria |
|---|---|---|---|---|---|---|---|---|
| 1899 | 100 | 126 | 120 | 152 | 75 | 245 | 151 | 105 |
| 1900 | 100 | 77 | 77 | 101 | 32 | 163 | 105 | 68 |
| 1901 | 100 | 45 | 51 | 56 | 19 | 74 | 62 | 39 |
| 1902 | 100 | 46 | 49 | 52 | 12 | 62 | 61 | 39 |
| 1903 | 100 | 49 | 55 | 70 | 16 | 111 | 68 | 47 |
| 1904 | 100 | 70 | 73 | 217 | 30 | 658 | 92 | 66 |
| 1905 | 100 | 78 | 83 | 371 | 31 | 825 | 104 | 66 |
| 1906 | 100 | 81 | 97 | 263 | 35 | 436 | 127 | 70 |
| 1907 | 100 | 89 | 117 | 178 | 30 | 253 | 126 | 73 |
| 1908 | 100 | 91 | 111 | 151 | 34 | 238 | 128 | 76 |
| 1909 | 100 | 94 | 112 | 137 | 36 | 208 | 131 | 96 |
| 1910 | 100 | 96 | 105 | 128 | 36 | 213 | 127 | 81 |
| 1911 | 100 | 100 | 96 | 132 | 35 | 190 | 138 | 73 |
| 1912 | 100 | 125 | 96 | 138 | 29 | 170 | 130 | 81 |
| 1913 | 100 | 158 | 122 | 160 | 30 | 160 | 149 | 100 |

To show the British differential more clearly, table 4 presents the same data with Britain as base 100. As is clear from table 3, the British (bar America) appears at the bottom of the international league table [41]. When examining the average military extraction ratios of the great powers, differentials of less than 0.5% do not attain significance, given the possibility of errors in the national income data. Thus the British ratio of 3.1 (1870-1913) is on an approximate par with those of Italy (3.3%), Germany (3.2%-3.6% or perhaps as much as 3.4%-3.8%) [42], and Austria (3.1%) [43]. However, the British burden is

[41] Note that this finding accords with the recent estimates made by Michael Mann. See *The Sources of Social Power: The Rise of Classes and Nations, 1760-1914* Vol. 2 Cambridge University Press, Cambridge (forthcoming).

[42] A different set of figures of German military expenditures has been produced by Peter-Christian Witt, *Die Finanzpolitik des Deutschen Reiches von 1903 bis 1913,* Historische Studien, Heft 145, Matthiesen Verlag, Lübeck & Hamburg (1970), Table 14, pp. 380-381. Here he provides a series of data which aggregate various military items omitted by Andic & Veverka. These expenditures were omitted by the War and Naval departments so as to provide the appearance to the international community that German military expenditures were relatively low. Certainly some of these extracted by Witt should be included in the present data. Firstly, Witt includes military pensions, which should certainly be added here. It is interesting to note that until about 1900, the British non-effective services accounted for approximately 18% of total army spending (see BPP, *Army Estimates*, 1900; XLIX), though of course British rates of pay were significantly higher than those of her continental rivals. Also included are the costs of

significantly less than those achieved by France, Russia and Japan. Indeed the British burden was 0.9% lower than that of the French (4.0%). Moreover, it is important to note that the extraordinary military expenditures have **not** been included in the French total. The inclusion of these expenditures would probably take the French military ratio up to about 4.5%, resulting therefore in an approximate 1.4% differential with Britain. Given that the British burden was 3.4% (1885-1913), the deficit with Russia (5.1 %) was a considerable 1.7% and a colossal 4.8% vis-à-vis the Japanese burden (8.2%).

Overall therefore, the British index was 78% that of the French, 67% that of the Russian, and 41% that of the Japanese. However the hidden costs of conscription should also be accounted for. As will be explained later, (see section 8), conscription pay rates were inadequate and had to be supplemented by the conscript with personal sources of finance.

If we add on the element of 'taxation in kind', the German military burden would increase within a range of 1-1¼%, taking the average burden (1870-1913) to within an approximate range of

specifically strategic railways. Although these should not be included, there is one qualification that should be made. Ordinarily it is extremely difficult to differentiate the "economic" from the "strategic" nature of a particular railway. However in various locations the German War Ministry insisted that where there was a line that extended to the front, several extra lines (sometimes 7 or 8) were to be built in parallel formation solely in order to enable the rapid deployment of troops. Clearly such lines had no **forward** linkages to the economy. Whilst there may be good reason to include these sums, preference here is to exclude them so as to remain consistent. Also Witt includes the following; military expeditions to East and South-West Africa; the widening of the North-East canals; as well as moneys devoted to colonial troops. He has also included the amount of debt interest which was derived from extraordinary military expenditures which should be omitted. Thus if we use the Witt figures but **deduct** total debt interest as well as the amounts for purely strategic railways (assuming them to be on average approximately 30m marks per annum), the overall burden would go up from **3.2%** to **3.6%.** It is also important to note that the years 1870 and 1871 which witnessed high military expenditures on account of the Franco-Prussian War have not been included here. If these were included we would expect the overall military burden (1870-1913) to increase by some 0.2%. When added onto the two sets of estimates we would expect a **final** burden range (1870-1913) to be in the order of **3.4% - 3.8%**

[43] But see footnote 46.

between 4½-5%. Under this scenario, the real British burden was approximately between 60-70% that of Germany's. Similar calculations would see the Russian burden increase from 5.1% to within a range of between 5¾-6% , whilst the French burden would increase from 4.0% to within a range of between 5½-6%. Thus the real British military burden was approximately between 55-60% that of the Russian (1885-1913), and between 50-55% that of the French (1870-1913). The military burdens of Austria and Italy would probably be increased by very approximately 1% of NNP (1870-1913). In sum, the continental military burdens would fall within a range of between 4-6% of NNP.

Thus the British real military ratio was approximately between 50-75% that of its continental counterparts (1870-1913), and approximately 40% that of the Japanese (1885-1913). In other words, Britain endured a significant military-extraction "gap" [44] vis-à-vis her Great Power rivals (bar America). Furthermore, the gap can be estimated by converting the differential vis-à-vis each country into sterling, for each year 1870-1913.

Over the *44-year* period, Britain "underspent" by £336m, compared to the average of all the great powers [45]. Put simply, Britain would had to have spent an extra £7.6m every year just in order to keep up with the Great Power average burden. More specifically, Britain would had to have spent an extra £807m between 1885-1913,

[44] Such a (military-burden) gap is **not** to be confused with the "Lippmann gap" as conceptualised by Walter Lippmann, *U.S. Foreign Policy: Shield of the Republic* (1943), Little, Brown, Boston; see also S.P. Huntington, "Coping with the Lippmann Gap", *Foreign Affairs*, Vol. 66, pp. 453-474.

[45] Avner Offer has criticised the Davis and Huttenback methodology on the grounds that it assumes the existence of an a prioristic ideal-typical level of military spending, which is problematic, given that defence requirements **differ** across countries; see Offer, "British Empire". The same objection could be made to the concept of British "underfunding". However, my point is to show that the British military extraction ratio was bar the U.S., the lowest of all the great powers. To make such a claim does not imply that there is a fixed fiscal-extraction level which all countries must reach. Nevertheless, we shall go on shortly to posit a possible counterfactual scenario of higher British military expenditures.

or £27.8m per year in order to match the burden imposed by the Russian state. The most striking example of British underfunding is that of the differential with Japan, where the former would had to have extracted (either through taxes or loans) an extra £1984m, or £68.4m per annum (1885-1913), just in order to match the latter's burden. The British funding deficit (1870-1913) is revealed strikingly against the French burden, which stood at £549m, or £12.5m per annum and, less strikingly, against Italy which stood at £123m, or £2.8m per annum. Between 1870-1913 the British spent £107m less than Austria, or £2.4m per annum[46]. However, Britain spent a massive £1414m or £32.1m per annum more than America. Note however, that because the "add-on" figures for "hidden conscription costs" have not been included, these figures therefore significantly underestimate the actual state of British underfunding.

## 6. Possible Margins of Error in the Military Burden Estimates

Before I enlarge upon these findings it is worth dealing with one possible objection to the analysis presented so far. It could be objected that the measurement of national income is so problematic that estimation of the military burden across countries will be very approximate. And that furthermore, if these NNP data are substantially wrong, the military burdens would also be highly spurious. The best I can do in reply is to present a set of alternative military burdens under different NNP scenarios.

[46] There is a certain "anomaly" here, revealed by the fact that Austria had a burden **equal** to the British (ie. 3.1%), but that overall the latter underspent in relation to the former. The difference comes about through the estimation procedure used to calculate the overall average military burden. Because weighted averages were not used, average burdens will be skewed slightly upwards if the yearly ratios are higher in the second half of the period. Austria had a relatively high burden in the first half and a low burden in the second, whilst the British position was the inverse. Thus the slight underestimation of the Austrian rate and the slight overestimation of the British rate is picked up when measuring the differential in pounds sterling.

I estimate that Russian NNP would have to be a substantial 50% higher (1885-1913) than the present estimates, in order for the Russian burden to equal that of the British (ie. 3.4). Moreover, Japanese NNP would have to be a colossal 140% higher than the present estimate before her military burden would be equal to that of the British, whilst the French NNP would have to be some 28% higher (or approximately 40% higher if extraordinary military expenditures were included). Or alternatively, the British NNP estimates would have to be 30% less in order to equate the present estimate of the Russian military burden and over 50% less to equate with the Japanese burden. However, I feel it most unlikely that the British NNP set has been overestimated. Note that the hidden costs of conscription have not been included in these calculations.

If the French 'add-on' figure is between 1½-2% and the overall average military burden is between 5½-6%, then the French NNP data would had to have been underestimated by approximately 60% in order to match the British burden, (or approximately 70% if extraordinary military expenditures were included). In addition, the Russian NNP would had to have been underestimated by approximately 65%. Furthermore, if the hidden costs of conscription for Italy and Austria were included (taking their military burdens to just over 4%), their national income estimates would had to have been underestimated by approximately 30% . Finally if the German burden was increased from 3.2-3.8% (1870-1913) to approximately 4½—5% then the NNP data would had to have been underestimated by about 50% in order to have matched the British burden. In sum, even if the French, German, Russian and Japanese NNP data have been underestimated, I believe that the margins of error required to validate the Davis and Huttenback thesis are unrealistic. The same would also apply to Austria and Italy.

## 7. The Causes of the low British Military-Extraction Ratio

Having established the fact that the British military burden was

comparatively low, two questions need to be answered. Firstly, why did the British state not extract higher taxes in order to boost military spending? Secondly, what consequences did British underfunding have for the stability of the European political-military system? Beginning therefore with the first question, there were several reasons for the low British burden.

In the first place, Britain was up to a point able to maintain a domestic fleet size by recalling ships stationed in the empire's waters, (conducted by Fisher, mainly after 1905) [47]. The recall of the empire's ships enabled considerable savings at the Exchequer, both potential as well as actual. Thus, not only did naval expenditures decrease in the following year, more importantly, the recalled ships were able to displace some, though not all, of the impetus to build new ships for home defence. In other words, the opportunity cost of recalling the empire's ships was an increased ship-building programme (on top of the one already in place), which would have seen naval expenditures soar in the first thirteen years of the twentieth century. In this alternative scenario, the British military burden would have been high. The empire therefore provided considerable relief to the British taxpayer. In other words, military expenditures incurred for colonial defence provided a type of "investment" strategy (albeit unintended), whereby the initial outlays would lead to future tax relief.

However, to fully appraise this above claim, means taking into account the "costs" of the British (imperial) "investment" in the first place. O'Brien would argue that the costs were incurred not just through the ordinary military expenditures made in the years down to 1913 (which have been shown to be minimal in terms of the burden placed upon the economy and the taxpayer), but also through the loans taken out over the past 200 years, in order to fund all the "colonial" wars, of which the annual interest payments were of

[47] Although, ironically, Fisher's Dreadnought also tended to undermine this exercise because it downgraded the viability of previous capital ships. It is also the case that the British boosted the Dreadnought programme in the period up to 1914; see especially Tables 18-21 in Jon T. Sumida, *In Defence of Naval Supremacy: Finance, Technology and British Naval Policy, 1889-1914*, Unwin Hyman, London 1989.

a considerable size [48]. On the basis of calculations made elsewhere [49], the annual interest repayments made by the British taxpayer, although certainly militarily derived [50], were at best only 50% colonial in origin. Thus the so-called "colonial" investment costs of maintaining the empire (through "costly" wars) were not nearly as large as O'Brien, Davis and Huttenback claim. However the tax relief that the colonies would later provide in the *run-up to* the First World War enabled the British military burden to remain low. This means that not only would the interest repayment figure given by Davis and Huttenback have to be revised downward by as much as 27% of the annual budget, when appraising the "costs" of imperialism, [51] but we should also appreciate the tax relief that colonial expenditures would later provide.

At this point it is briefly worth examining the claim that British total government expenditures were the highest in the "developed" world [52]. To appraise this claim, I resort to my preferred methodology — the estimation of real total government expenditures as a proportion of national income (GE/NNP ratio) [53]. Table 5 below shows that Britain enjoyed a comparatively low burden.

[48] O'Brien, "*Costs and Benefits*", pp. 187, 193-194. See also "*The Political Economy of British Taxation, 1660-1815*" pp. 1, 2, 4, 5, 21-22.
[49] Hobson and Hall, "*Britain's Military Burden*", pp. 8-9.
[50] See BPP XXXV (1868-9); BPP XXXIII (1857-8) pp. 62-9, 70-83, 93-105; BPP LII (1898) Cd. 8966. pp. 6-9; BPP, *Statistical Abstract*, CXII (1914-16), Cd. 8128, n. 62 p. 10.
[51] Davis and Huttenback, *Mammon*, Table 6.4, pp. 178; also reproduced in O'Brien "*Costs and Benefits*", Table 4, pp. 187.
[52] Davis and Huttenback, *Mammon*, Table 4.2, pp. 123. Note however that they claimed that if railways are included and that the colony-weighted rather than the population-weighted index is used, those colonies with **responsible** government actually spent more (most notably the Australian colonies).
[53] Note that the table here refers to **total** government expenditure (that is at **all** levels of government). It is in fact incorrect to compare only central government expenditure levels as O'Brien does ("*Costs and Benefits*" Table 4, pp. 187) because all states had different **concentrations** of fiscal resources between local and central states. This is most evident with the difference between unitary and federal states, as indeed Paul Kennedy points out ("Debate" pp. 189-190). However, there are significant differences between **unitary** states. Thus, for example, in Russia there was an approximate ratio between centre and local states (in terms of total revenue) of 90:10 respectively, compared to a very approximate 60:40 in Britain. Thus in response to O'Brien's point ("Reply" pp. 196), whilst analysis of central government expenditure is sufficient for comparison of

Table 5

The Total Government Burden (GE/NNP) of various Great Powers 1870-1913

| Year | Britain | Germany | Russia | Japan |
|---|---|---|---|---|
| 1870 | 9.9 | 22.6 | - | - |
| 1880 | 10.9 | 12.8 | - | - |
| 1890 | 9.5 | 13.1 | 18.8 | 11.2 |
| 1900 | 16.1 | 13.9 | 20.3 | 22.0 |
| 1910 | 13.7 | 15.6 | 18.9 | 47.7 |
| 1913 | - | 16.5 | 21.5 | 31.6 |
| Average 1885-1913 | | | 20.0 | 28.4 |
| 1870-1913 | 12.5 | 15.5 | | |

*Source and notes:* **Goverment Expenditures - Britain** Average Years (1870, 1880, 1890, 1900, 1910). A. T. Peacock & J. Wiseman, *The Growth of Government Expenditure in the United Kingdom* (1961), Princeton University Press, Princeton [NBER, No. 72], Table A5 pp. 164. **Germany** Average Years (1870, 1880, 1890, 1900, 1910, 1913). N. Leineweber[54], *Das Säkulare Wachstum der Staatsausgaben* (1988), Vandehoeck & Ruprecht, Göttingen; Table 8, pp. 299, Table 26, pp. 349. Note that these figures are considerably **lower** than those supplied by Andic and Veverka. These figures were taken from O. Weitzel who in turn took his figures from, *Statistisches Bundesamt, Statistik der Bundesrepublik*, Bd. 227 (1950-1956) and Bd. 259 (1957-1958). **Russia** Average Years (1885 and in 3 yearly intervals thereafter upto 1913) Central - P. A. Khromov, *Ekonomicheskoe razvitie Rosii v XIX-XX Vekakh 1800-1917*, Institute of Economics, Academy of Sciences, USSR pp. 514-530. Local - P. R. Gregory, *Russian National Income*, Table 3.2, pp. 58-59. **Japan** Average (all years 1885-1913). K. Emi, *Government Fiscal Activity and Economic Growth in Japan 1868-1960* (1963), Kinokuniya Bookstore Co., Tokyo, Appendix 2, Table A-1, pp. 140-142.

It is worth noting that the French government expenditure burden stood at approximately 19% of NNP. Austrian expenditures were also clearly in excess of British levels. Only the United States had a lower government burden (at all levels), averaging well under 10%[55].

Returning to the question as to why the British state did not increase its overall rate of fiscal extraction, there are several other factors to be taken into account. In particular, the **nature** of the

military expenditures, it is certainly inadequate in providing an overall estimate of government spending on a *cross-national* basis.

[54] I am grateful to Michael Mann for this source.

[55] French government expenditures were taken from M. Mann, *The Sources of Social Power: Vol. 2*, Table 11.1. Note that French expenditures were an average of the years 1870, 1880, 1890, 1900, 1910. The Austrian and American burdens are found in table 11.3. Note that Mann's French government burden is lower than the one presented here because he used GNP rather than NNP.

political regime played a structural part in the maintenance of low real taxes and expenditures. The parliamentary nature of the British state was one structural factor in the maintenance of low taxes, because a **large** increase in the rate of fiscal extraction could jeopardise the electoral viability of either party. This political aspect of British fiscal policy was, at least up to the Edwardian era, complemented by Cobdenite and Gladstonian thinking, which was based on a staple diet of liberal political economy. From this perspective, not only military but **all** taxes were deemed to be economically unproductive[56]. As Gladstone himself put it, "All taxation operated in restraint of trade, and therefore, in order to reduce prices, in order to secure full employment, it was necessary to keep taxation and public expenditure at a minimum"[57].

## 8. Estimating the costs of British military recruitment policy

The peculiarly British political-economic culture, however, also served (somewhat ironically) to increase military expenditures in a way that was avoided on the continent. This reflected the different military recruitment practices. The continental practice of conscription proved considerably cheaper than the British system of a volunteer, long-standing army (and navy).[58] In particular, conscripts had to supplement their very low rates of military pay with personal sources and/or civilian employment. These amounts would, of course, not

[56] See especially Adam Smith, *The Wealth of Nations,* London (1776/1961), Book II, Ch. 3, pp. 366-7. John Stuart Mill, *Principles of Political Economy,* Longmans, Green and Co., London (1891) pp. 490-491, 496-501, 522-523, 533. James Mill, *Elements of Political Economy* (1844/1963), (3rd Edition, Henry Bohn, London), pp. 271-275. David Ricardo *The Principles of Political Economy and Taxation* (1817/1971), Penguin Books, Harmondsworth, pp. 168-172. For good general accounts, see D. French, *British Economic and Strategic Planning, 1905-1915,* G. Allen and Unwin, London (1982) pp. 7-21; G. Kennedy, *Defence Economics,* Ch. 1; H.V. Emy, "The Impact of Financial Policy on English Party Politics before 1914", *Historical Journal,* Vol. 15, No. 1, pp. 103-131.

[57] quoted in Davis and Huttenback, *Mammon* p. 315.

[58] as conceded by O'Brien, "Costs and Benefits" pp. 189-190. Kennedy, "Debate" pp. 189.

show up on the budgetary accounts of the respective state. Thus to get a true picture of the real military burden means supplementing the d/NNP formula with an estimate of the amounts that the conscripts raised in order to supplement their meagre remuneration from the state.

However, before making the necessary calculations, it is worth illustrating the differential between British volunteer and continental conscription rates of pay. This can be done by calculating what the British burden would have been, had continental rates of pay been adopted. The penultimate column of table 6 shows that the British burden would have been reduced by approximately 0.7% of NNP had German rates of pay been adopted, taking the average ratio from 3.1 to 2.4% (1870-1913). The Russian private was paid approximately 5% that of his British counterpart. Under these rates of pay, the British burden would have been reduced by approximately 1¼% of NNP, taking the average ratio from 3.4 to 2.2% (1885-1913). A similar reduction would apply had Britain adopted French pay rates. Finally, it is likely that the reduction would be at least 0.7% of NNP under Italian or Austrian pay rates. Clearly the British burden was to a large extent determined by the **political** demand for a volunteer army, rather than to the exigencies of imperialism.

Table 6

Estimated Costs of the British Military Recruitment Policy

| Year | (1) Britain: Average Military Pay (£) | (2) Germany: Average Military Pay (£) | (3) Pay Differential Index [1/2x100] | (4) Total British Military Pay (£m) | (5) Alternative British Military Pay (£m) [4/3x100] | (6) Difference [4-5] | (7) Actual British Defence Costs (£m) | (8) Alternative British Defence Costs (£m) [7-6] | (9) Alternative British Military Burden (£m) [8/NNPx100] | (10) Actual British Military Burden (£m) [7/NNPx100] |
|---|---|---|---|---|---|---|---|---|---|---|
| 1903 | 46 | 18.2 | 255 | 31.1 | 12.2 | 18.9 | 100.6 | 81.7 | 4.8 | 5.9 |
| 1904 | 49 | 19.5 | 250 | 23.3 | 9.3 | 14.0 | 72.2 | 58.2 | 3.4 | 4.2 |
| 1905 | 48 | 22.1 | 219 | 23.1 | 10.6 | 12.5 | 66.0 | 53.5 | 3.0 | 3.7 |
| 1906 | 48 | 26.2 | 183 | 22.8 | 12.5 | 10.3 | 62.2 | 51.9 | 2.8 | 3.3 |
| 1907 | 50 | 26.6 | 189 | 22.8 | 12.0 | 10.8 | 59.2 | 48.4 | 2.5 | 3.0 |
| 1908 | 52 | 22.1 | 234 | 22.7 | 9.7 | 13.0 | 58.5 | 45.5 | 2.4 | 3.1 |

| Year | (1) Britain: Average Military Pay (£) | (2) Germany: Average Military Pay (£) | (3) Pay Differential Index [1/2x100] | (4) Total British Military Pay (£m) | (5) Alternative British Military Pay (£m) [4/3x100] | (6) Difference [4-5] | (7) Actual British Defence Costs (£m) | (8) Alternative British Defence Costs (£m) [7-6] | (9) Alternative British Military Burden (£m) [8/NNPx100] | (10) Actual British Military Burden (£m) [7/NNPx100] |
|---|---|---|---|---|---|---|---|---|---|---|
| 1909 | 52 | 22.9 | 226 | 22.5 | 9.9 | 12.6 | 59.0 | 46.6 | 2.4 | 3.1 |
| 1910 | 51 | 22.6 | 224 | 22.2 | 9.9 | 12.3 | 63.0 | 50.7 | 2.6 | 3.2 |
| 1911 | 51 | 21.8 | 236 | 22.6 | 9.6 | 13.0 | 67.8 | 54.8 | 2.6 | 3.3 |
| 1912 | 51 | 22.8 | 222 | 22.9 | 10.3 | 12.6 | 70.5 | 57.9 | 2.7 | 3.2 |
| 1913 | 50 | 19.6 | 255 | 22.9 | 9.0 | 13.9 | 72.5 | 58.6 | 2.6 | 3.2 |
| Average | 50 | 22.2 | | | | | Average (1903-1913) | | 2.8 | 3.5 |

*Sources and Notes:* **Germany:** W. G. Hoffmann, *Das Wachstum der Deutschen Wirtschaft seit der mitte des 19 Jahrhunderts*, Springer-Verlag, New York (1965) pp.489-490 and Table 199, pp. 122-3. These were converted into sterling using the pre-war parity. **Britain;** the figures were taken from the British Parliamentary Papers (Army and Navy Estimates). Thus see *Army Estimates;* BPP 1903 XXXVIII pp.4-5; BPP 1912 XLVI pp.8-9; BPP 1912-13 L pp.2-3; BPP 1913 XLII pp.2-3. *Navy Estimates;* BPP 1904 LII; BPP 1911 XLVIII; BPP 1912-13 LIII. The final figures were derived by taking the average of the regular servicemen. Thus part-time recruits are ignored. In the estimation of average military pay, I added only **effective** pay for the regular army and navy (Col. 1). Note, however, that col.4 aggregated effective and non-effective military pay. This would therefore overestimate my figure expressed in the penultimate column, since the size of the total pay would have been considerably larger, (particularly if the "wages" of all military personnel were included). Note however that the pay differential between British and German rates was at its height after 1902, when British military pay was radically improved[59], thus making the differential smaller prior to 1900.

More importantly, there is the fact that conscript rates of pay were so low that the soldier had to supplement his remuneration with external sources of income, which came from families and/or civilian employment. Estimating these sums is of course highly problematical. Fortunately there is a formal method of accounting for the 'hidden costs' of conscription. Patrick O'Brien has pointed out that the differential in pay rates between these two recruitment practices represents a form of 'taxation in kind'[60]. This 'taxation in kind' can be measured "as the differential between the money wage a typical ... conscript might potentially have earned in the civil economy and the real wages received

[59] See especially E.M. Spiers, *Army and Society* pp. 55. I am grateful to David French who pointed this out in a private conversation.
[60] O'Brien, "Costs and Benefits", pp. 190; see especially G. Kennedy, *The Economics of Defence*, Faber & Faber, London (1975), pp. 62, 96-102.

in money and subsistence while he remained under arms"[61]. These wage gaps relative to the British were considerable. The French private was paid approximately 1% that of the average civilian wage, the German 8%, and the Russian 7%, which compared to the British ratio of between 50-64%[62]. Clearly the continental wage gaps were considerable.

If we calculate what the continental pay rates would have been had the conscripts been paid a market wage, we arrive at a fuller understanding of the real military burdens of the great powers relative to the British. The 'add-on' figure for Germany in 1913 would be approximately between 1-1¼% of NNP. Assuming this add-on figure to be representative for the whole period (1870-1913), we would expect a final average burden to be in the range of 4½-5%[63]. The add-on figure for Russia would perhaps be in the range of ¾-1% of NNP, taking the overall burden to 5¾-6% (1885-1913). The French burden would have been increased by approximately 1½-2% of NNP, taking the average burden to approximately 5½-6% (1870-1913)[64]. Thus the real British burden was approximately

[61] O'Brien *Ibid.*

[62] Pay rates for privates in Germany and France in J. Bushnell, *Mutiny Amid Repression: Russian Soldiers in the Revolution of 1905-1906,* Indiana University Press, Bloomington, (1985) p.14. The Russian figure was taken from W.C. Fuller, *Civil-Military Conflict in Imperial Russia 1881-1914,* Princeton University Press, NJ (1985), p. 147. Note that a much lower figure is given in Bushnell, Ibid. British military pay rates for privates are quoted as £25-50 per annum, but as much as £40-100 if various financial allowances are included; see "United Kingdom" *Encyclopedia Britannica,* London (1911), 11th edition, p. 608. Spiers produces a higher figure than the one used here; that of approximately £30; E.M.Spiers, "The Regular Army in 1914" in I.W.F. Beckett and K. Simpson (eds), *A Nation in Arms: A Social Study of the British Army in the First World War,* Manchester University Press, Manchester (1985) p. 46. K.Jeffery estimates that a British private earned 63% that of the average civilian; Jeffery, "The Post War Army" in Beckett and Simpson, *Nation in Arms,* p. 224; cf. O'Brien, "*Costs and Benefits*" pp. 189-190. According to Spiers, the British private was paid 85% that of the poorest agricultural labourers; Spiers, Ibid. I estimate that the **average** military wage in Britain was approximately 80% that of the average civilian wage. See footnote 64 below for sources of civilian wages.

[63] See footnote 42 for an explanation of the upper range estimate.

[64] British, French and German civilian wages taken from; E.H. Phelps Brown and M.H. Browne, *A Century of Pay,* Macmillan, Melbourne (1968) Table 2, p. 46; V. Zamagni, "An International Comparison of Real Industrial Wages 1890-1913: Methodological

50-55% that of the French, 55-60% that of the Russian and 60-70% that of the German. Assuming an approximate add-on figure of 1% of NNP, the British burden would be approximately 75% that of the Austrian and Italian ratios. Overall, the continental military ratios would therefore be increased by between 1-2% of NNP if the 'hidden costs' of conscription were included [65]. The continental burdens would fall within the range of 4-6% compared to 3.1% (1870-1913) and 3.4% (1885-1913) for Britain. Whilst more careful research is still required to provide a more accurate estimate of the costs of conscription, nevertheless these final burden figures provide a more accurate index of the differential between British and continental military burdens than that provided by the more formal d/NNP ratio.

It is interesting to note that this argument has to some extent been pre-empted by O'Brien who, whilst recognizing the pay differential, goes on to argue that these continental military wage rates were probably too high since the economies (particularly of Russia and Italy, though not of Germany) were afflicted with under-employment. That is, these states probably paid too much for their average soldiers, since they would have been employed for less in the civilian economy (if at all!) [66]. There is probably some truth in this. However, several comments should be made. Firstly, there was also underemployment in the British economy (though clearly not on anything like the same scale) [67]. Secondly, and more importantly, measuring the differential between the military and civilian labour markets within a given

Issues and Results" in P. Scholliers (ed), *Real Wages in Nineteenth and Twentieth Century Europe: Historical and Comparative Perspectives*, Berg, NY (1989), Table 5.9, pp. 130-1, Table 5.10, pp. 132-3, Table 5.13, p. 136; W.G. Hoffmann, *Das Wachstum der Deutschen Wirtschaft*, Table 119, p. 422-5. For Russia see H. Rogger, *Russia in the Age of Modernisation and Revolution 1881-1917*, Longman, London (1987), p. 113; P. Gatrell, *The Tsarist Economy, 1850-1917*, Batsford, London (1986), p. 94 — also Table 3.5, pp. 76. Note however that estimating the average Russian wage is highly problematic, thus making the Russian 'add-on' figure only very approximate.

[65] Cf. the estimate made by Offer, "*British Empire*".

[66] O'Brien, "*Costs and Benefits*", pp. 190.

[67] And furthermore, the unemployed provided a significant pool of recruits in the British army. Avner Offer, "*British Empire*". See also E.M. Spiers, *Army and Society*, pp. 44-45, 55, although this is acknowledged by O'Brien, - "*Cost and Benefits*", p. 189.

country may show that the respective state could have paid even less for their soldiers. But the fact remains that relatively British rates were considerably higher and would have been even higher had, say, the Russian and Italian states taken advantage of the weak civilian labour market in the setting of their military pay rates. In any case, it was most unlikely that these states could have paid much less. As it was, Russian soldiers baked their own bread, tailored their own uniforms and cobbled their own boots. The Russian army was furthermore much less well paid, equipped and fed than her Western European counterparts [68]. Less pay would have almost certainly boiled away the already low levels of military efficiency, to leave an army that would simply have been unable to carry itself into, let alone out of, war [69]. In any case, the main point here is that continental conscripts supplemented their military remuneration with other sources of income and that these amounts should be included when calculating the real military burden of the great powers. O'Brien correctly points out that British officers required private means to serve as gentlemen [70]. These private amounts should indeed be taken into account. However, it is probably the case that the addition of these hidden costs would make no significant difference to the final British military burden estimates.

## 9. Towards a Counterfactual Scenario to the First World War

At this stage it is worth examining a possible counterfactual [71],

[68] W. C. Fuller, *Civil Military Conflict*, pp. 53-54. See also J. Bushnell, "The Tsarist Officer Corps 1881-1914: Customs, Duties, Inefficiency", *American Historical Review*, Vol. 86, No. 4 (October, 1981), pp. 765-771. Also J. Bushnell, *Mutiny Amid Repression*, pp. 11-23.

[69] Indeed this is only reinforced by the fact that British pay rates, certainly until 1900, were deemed to be very low; so much so, that it led to severe recruitment problems. See Spiers, *Army and Society*, Ch. 2. Moreover, low rates of pay (as well as poor living conditions) led to serious mutinies by about a third of the Russian army between 1905-7: See Fuller, *Civil-Military Conflict*, pp. 146-9; J. Bushnell, *Mutiny Amid Repression* pp. 11-23.

[70] O'Brien, "Costs and Benefits", p. 189. See also, W.S. Hamer, *The British Army: Civil-Military Relations 1885-1905* Clarendon Press, London. (1970) pp. 15-17; also E.M. Spiers, "The Regular Army in 1914" p.46.

which is somewhat ironically not dissimilar to the one described by O'Brien[72]. Following the recent analysis of Aaron Friedberg,[73] Britain found herself sitting on a dangerous and extremely precarious fence in the run up to the Great War. British military power was being eclipsed, as was publicly evidenced during the Boer War. By the early twentieth century it seemed clear that a **larger** standing army and navy was not only necessary but essential, if Britain was to hold her own in any future European conflict. This would necessarily entail a rise in the rate of fiscal extraction, which was deemed to be almost at crisis point. Instead Britain moved away from such a course of action by securing a military alliance with Japan and an *entente* with France and Russia. This, coupled with her recalling of the ships from the empire, enabled actual as well as potential relief to the British tax payer[74]. However, the cost of this tax-substituting exercise was a relative reduction in her military power. The repercussions I would argue were potentially enormous.

According to Friedberg, "with a larger, more capable, and more readily expandible army, the British might have been able to indefinitely deter a German assault on France. Failing that, they might at least have been better prepared to play a decisive role in the early stages of a continental conflict"[75]. Is such a counterfactual plausible? In 1913 Germany enjoyed a massive superiority over Britain in terms of army size. Indeed Germany had a wartime force of

[71] This is in response to O'Brien who asks, "... has the time not arrived for diplomatic and military historians to pay some attention to the possible validity of counterfactual scenarios for defence... in opposition to the foreign and strategic policies actually pursued for, say, the three decades down to 1907?" - "*Costs and Benefits*" pp. 197-198.
[72] See O'Brien, "*Reply*", pp. 194-195; O'Brien, "*Costs and Benefits*", pp. 197-199.
[73] A. L. Friedberg, *The Weary Titan: Britain and the Experience of Relative Decline, 1895-1905*, Princeton University Press, NJ (1988). See also T.J. McKeown, "The Foreign Policy of a Declining Power", *International Organization*, Vol. 42, No. 2 (Spring) 1991 pp. 268-269.
[74] See A.L. Friedberg, *The Weary Titan*, pp. 135-208, 269-298, 301-303. Also P.M. Kennedy, *The Rise of the Anglo-German Antagonism, 1860-1914*, The Ashfield Press, London (1987), p. 359. P.M. Kennedy, *The Rise and Fall of British Naval Mastery*, Macmillan, London 1983, Ch. 8. P.M. Kennedy, *Strategy and Diplomacy 1870-1945*, Fontana, London (1984) pp. 22-23. P.M. Kennedy, *The Realities behind Diplomacy*, Ch. 2.
[75] Friedberg, *The Weary Titan*, pp. 301-2.

some 3.8 million men compared to a mere 160,000 in the British Expeditionary Force, as well as some 400,000 reservists and territorials [76]. There is little doubt that the minute nature of the British army meant that the German military was given in effect a "free hand". As the Kaiser put it typically in 1911, "Excuse my saying so, but the few divisions you (the British) could put into the field could make no appreciable difference" [77]. There was only one method by which Britain could increase its army to a size that could possibly deter Germany, and that meant conscription. If Britain had adopted conscription and had made only a modest increase in military spending, she might have expanded her army to between 1½-2 million men. In addition, if Britain had formed a military alliance with France and had stationed troops on French soil well before 1914, it is possible that Germany might have been deterred from striking at all. Indeed, given that the total available French wartime army was not much smaller than that of Germany's, it is surely the case that an addition of a substantial body of British conscripts would have swung the military balance towards the allies. Of course it is possible that an earlier move by the British of this nature might have led to a preemptive strike by the Germans. But this is of course not a certainty. Moreover, had the British moved over to conscription and higher taxes in the early 1890s, the possibility of deterrence would surely have been increased. It is not possible within the confines of this article to close this debate. But nevertheless, one thing can be safely concluded. Had Britain extracted a military burden equivalent to that of Russia, she could have very nearly doubled her army spending (or more than tripled it under the equivalent Japanese burden scenario). With an increase of 2% of NNP devoted to military

[76] German figures from *Handbuch Zur deutschen Militärgeschichte, 1648-1939, Bd.V* Militärgeschichtliches Forschungsamt (Frankfurt-an-Main) 1968. The Feldheer (field army) was 2.1 million and the Besatzungsheer (territorial forces) stood at 1.7 million. I am grateful to David Stevenson for this information. See also E.M. Spiers, "The Regular Army in 1914", pp. 57; *Army Estimates*, BPP 1913 XLII.

[77] quoted in K.M. Wilson, *The Policy of the Entente: Essays on the Determinants of British Foreign Policy 1906-1914*, CUP, Cambridge, 1985, p. 47.

spending, it is entirely possible that Britain could have amassed a wartime army prior to 1914 of between 1½-2 million men. Such an increase would not have been exorbitant. Indeed the British taxpayer would have remained the least burdened of all the Great Powers, bar America (see table 5). Furthermore, had the British relaxed their liberal-held notions of political economy, they could have resorted to loans as a means of displacing some of the immediate fiscal pain. In addition, the **unitary** nature of the British state would have enabled an increase in centrally-provided revenues on a scale that could not have been possible within the **federal** Reich governmental system. Moreover, the Reich was on the brink of fiscal crisis, and its struggle to raise new revenues was revealed by its growing resort to loans [78]. An earlier boost in taxes prior to 1906 may well have seen Britain return to protectionism, in order to provide the required indirect taxes to fund such a programme as opposed to the Liberal preference of increasing direct taxes [79].

One objection to the feasibility of this argument would be that the British state had consistently favoured the preferences of the City of London (as opposed to industry), and given that the City was in favour of free trade, the move to protection was extremely unlikely. But in 1909 the City actively favoured tariff protection as opposed to the Liberal strategy of the income tax and free trade. This was the result of their preference for lower personal taxation. Thus a return to protection in 1900 would probably not have been resisted by the City interests [80]. Nevertheless I can certainly agree with O'Brien when he states that "[an] earlier preparation for the strategical role of preserving the balance of power in Europe would not necessarily have been 'horrendously expensive'" [81].

[78] See my "*The Tax-Seeking State*" Ch. 6. See also J.T. Sumida, *In Defence of Naval Supremacy*, pp. 196; P.C. Witt, *Die Finanzpolitik*, p. 386; P.M. Kennedy, *The Rise of the Anglo-German Antagonism*, Ch. 17.
[79] This was the preferred Tory Party option after 1907 when the fiscal crunch came, (premised on the political needs of Dreadnoughts and working-class pensions).
[80] For further details see my "*The Tax-Seeking State*", Chapter 4.
[81] O'Brien, "*Reply*", pp. 195.

I would suggest therefore that had Britain not underfunded her military establishment and had spent as much as Japan, Russia or perhaps even France, she might have been able to indefinitely deter Germany[82]. Whilst it would be untrue to argue that British military underfunding led to the First World War, it might, however, have been the case that higher taxes (or a higher military burden) could have prevented it from taking place. If this was the case, such spending "would have to be judged a remarkably cost-effective investment of public monies"[83]. Indeed, given my hunch that British decline was stimulated to a large extent by the First World War[84], such a fiscal investment would clearly have constituted a tremendous economic growth **saving** strategy (albeit unintended). Most ironically of all, such an investment would have been a tremendous fiscal-saving strategy (albeit unintended). One thing is certain; that the First World War created a large fiscal "displacement effect" (as Peacock and Wiseman have termed it in *The Growth of Government Expenditure in the United Kingdom).* That is in the seventeen years up to 1913, the central government burden (C.G.E/NNP) was on average 8.3%, compared to 19.3% in the years 1923-1939. Clearly such a large tax-hike would not have occurred had the war itself been avoided. O'Brien has also argued that a larger army may have deterred Germany indefinitely, though he blames the British state for misallocating military resources, whilst here I blame Britain's low taxation rate.

## 10 Conclusion

This then brings me to my final point. If Britain "underspent" as

[82] A similar conclusion is expressed by T.J. McKeown, "*The Foreign Policy of a Declining Power*", pp. 268-269. See also D. Kagan, "World War I, World War II, World War III", *Commentary,* Vol. 83, No. 3 (1987), p. 24.
[83] McKeown, "Foreign Policy", *Ibid.*
[84] See for example J.A. Hall, "Will the United States Decline as did Britain?" in M. Mann, *The Rise and Decline of the Nation State* (1990) Basil Blackwell, Oxford; M. Mann *States, War and Capitalism* (1988) Basil Blackwell, Oxford, Ch. 8.

the figures suggest is the case, the whole basis of the Davis and Huttenback thesis becomes problematic. They claim that if all British possessions had assumed levels of defence expenditure equal to those borne by countries at similar stages of development, the average British military burden would have been well under 1%[85]. It must surely be wondered whether under this scenario, an independent Britain would indeed exist today!

As has already been argued, it is debatable as to whether the British really could have made any **real** savings in the absence of empire. Nevertheless, even with empire, the British state remained (bar America) the least burdened of the Great Powers in the period 1870-1913. This has repercussions for the application of the theory of imperial overstretch as an explanation for Britain's relative economic decline in this period[86]. If we accept the Cobdenite assumption that military expenditures reduce economic growth (as argued by O'Brien and Davis and Huttenback), then the theory as applied to Britain between 1870 and 1913 has no foundation. Put simply, it becomes logically impossible when holding the Cobdenite assumption to apply the theory, given that Britain endured a large military extraction gap or deficit with her continental rivals[87]. As has recently been pointed out, British military consumption (burden) increases were only of a moderate nature; and that such increases that occurred were in any case from a very low base — and certainly not on the scale anticipated

[85] Davis and Huttenback state that if subjects in the empire had paid for their own defence, the British taxpayer would have saved over £1 per person per annum (i.e. more than 2% of NNP); *Mammon* (2nd edition); see the A+B+C" scenario on page 134 and chart 5.4 (a) pp. 135. Also pp. 136, 265-266.

[86] See especially O'Brien, "Costs and Benefits", p. 199; O'Brien, "Reply", p. 198. The application of this theory in an explanation of Britain's relative economic decline finds its classic expression in the theory of hegemonic stability as outlined by Robert Gilpin, *War and Change in World Politics*, Cambridge University Press, Cambridge (1981) Chs. 5 and 6.

[87] Of course earlier on in this article, doubts were raised as to the validity of the Cobdenite thesis. Nevertheless, short of rejecting the figures in Table 3 completely, conceptually the only way of rejecting the conclusion is to abandon the Cobdenite assumption altogether. However, to do so would simultaneously undermine the whole "costs" thesis as articulated by Davis and Huttenback and Patrick O'Brien.

by the imperial overstretch thesis [88]. Furthermore it is hard to see how such a low burden could have such a drastic effect on the British economy [89]. Indeed if Paul Kennedy is correct in assuming that a military burden of 10% over the long-run may limit economic growth (and a burden of 5% when an economy is structurally weak) [90], then either way, Britain's burden of 3% would certainly not have constituted "imperial overstretch". In fact Britain enjoyed the privilege of fiscal-military understretch, at least in the period 1870-1913.

The picture of an overstretched Britain in the face of her colonial and military commitments seems in the cold light of statistical enquiry to be incorrect. When one examines the various debates held within the British establishment over the issues of conscription and the formation of an alliance as opposed to an *entente* with France, it is clear that the British were simply unwilling, rather than being unable, to commit themselves seriously to preventing a German strike on the continent, (though they were committed to protecting themselves

[88] See K.A. Rasler and W.R. Thompson, "Relative Decline and the Overconsumption-Underinvestment Hypothesis", *International Studies Quarterly* (1991) Vol. 35 pp. 280-281.

[89] A point also made by Offer, "British Empire". Indeed, a cursory comparison of the late 19th century with the 20th century burden is instructive. Between 1979-1990 the British index was approximately 4.8% of GDP [as calculated from K. Hartley, *Economics of Defence Policy* (1991) Table 1.2 pp. 4]. Furthermore, these rates were lower than those endured between 1950-1970 (see Hartley, *Economics of Defence Policy*, Table 4.1, p. 43. See in particular, R. Smith, "Defence Spending in the United Kingdom" in K. Hartley and T. Sandler (eds), *The Economics of Defence Spending: An International Survey* Routledge, London (1990), Figure 4.1, p. 78. The mid to late twentieth-century British military index was very approximately 170% that of the late nineteenth-century burden. For a similar conclusion see Rasler and Thompson, "*Relative Decline*", Table 1, and also pp. 280-281. Furthermore, with the exception of Greece and the U.S., Britain has endured the highest military extraction ratio of all the powers in NATO; see for example K. Hartley, *Economics of Defence Policy*, Table 4.2, pp. 53. Given this, there is surely no reason to allocate special attention to the burden extracted between 1870-1913, except perhaps to note its historically low nature, particularly in relation to her European neighbours.

[90] P.M. Kennedy, *The Rise and Fall of the Great Powers*, p. 609, fn. 18; though it should be noted that these figures seem somewhat arbitrary. Indeed nowhere in this book is there an explanation or justification given for the adoption of these figures.

with a stronger navy)[91]. Nowhere was this "unwillingness" more evident than on the issue of increasing military spending to a significant degree. Thus Britain was not so much a "weary" but rather a "wary" Titan; not so much overburdened by her military commitments but simply unwilling to endure a higher fiscal extraction ratio[92]. If the counterfactual assumption is correct, then an increase of military expenditures by approximately 2% of national income **might** have been sufficient to avert disaster. Thus, with historical hindsight, it remains a tragic possibility that the "cost" of sustaining higher taxes in the period up to 1913 in order to narrow or eradicate the military-extraction gap or deficit *vis-à-vis* her continental rivals, as well as enduring the political costs of adopting conscription, and forming an alliance with France, might have been a price worth paying.

[91] See especially the discussion in K.M. Wilson, *The Policy of the Entente*; R.J.Q. Adams, and P.P. Poirier, *The Conscription Controversy in Great Britain, 1900-18*, Macmillan, London 1987.

[92] A similar wariness seems to be echoed in America today. Indeed there is good evidence to show that the United States' budget deficit today is not the result of excessive military expenditures (although these certainly are the highest in real terms in NATO), but is caused rather by her very low fiscal extraction rate. Together with Japan, the U.S. probably extracts the lowest taxation rate of all OECD countries. If anything, military expenditures have become a convenient scapegoat for the wary American taxpayer.

# APPENDIX 1

## *Military Expenditures of the Great Powers 1870-1913*

| Year | Britain (£m) | Italy (Li m) | Germany (Marks m) | Russia (Rb m) | America ($m) | Japan (¥m) | France (Fr m) | Austria (Kr m) |
|---|---|---|---|---|---|---|---|---|
| 1870 | 22.8 | 215.1 | — | 165.3 | 79.5 | 2.7 | 602.6 | 151.4 |
| 1871 | 22.5 | 177.9 | — | 180.4 | 55.2 | 3.4 | 553.7 | 167.9 |
| 1872 | 24.3 | 196.9 | 295.0 | 188.2 | 56.7 | 9.6 | 605.7 | 152.5 |
| 1873 | 23.1 | 209.3 | 338.0 | 200.8 | 69.8 | 9.8 | 632.8 | 156.6 |
| 1874 | 24.4 | 217.1 | 381.0 | 198.7 | 73.2 | 13.6 | 626.0 | 159.2 |
| 1875 | 24.6 | 218.2 | 434.0 | 201.3 | 62.6 | 12.3 | 640.8 | 154.2 |
| 1876 | 25.0 | 224.1 | 418.0 | 218.4 | 57.1 | 32.7 | 692.6 | 168.9 |
| 1877 | 25.5 | 250.2 | 443.0 | 219.7 | 52.1 | 28.0 | 732.8 | 164.8 |
| 1878 | 28.6 | 251.4 | 457.0 | 213.4 | 49.6 | 9.9 | 754.1 | 297.7 |
| 1879 | 30.2 | 231.3 | 431.0 | 214.8 | 55.5 | 11.5 | 731.9 | 191.9 |
| 1880 | 28.4 | 256.6 | 426.0 | 238.0 | 51.6 | 12.5 | 752.2 | 162.6 |
| 1881 | 25.8 | 255.7 | 446.0 | 256.2 | 56.2 | 12.3 | 831.9 | 168.3 |
| 1882 | 27.4 | 283.2 | 433.0 | 233.4 | 58.6 | 12.8 | 861.7 | 206.7 |
| 1883 | 29.8 | 319.3 | 425.0 | 233.3 | 64.2 | 19.7 | 874.8 | 176.1 |
| 1884 | 27.8 | 310.5 | 433.0 | 234.8 | 56.7 | 20.5 | 888.0 | 183.1 |
| 1885 | 30.6 | 330.9 | 442.0 | 245.6 | 58.7 | 18.0 | 909.5 | 175.4 |
| 1886 | 39.4 | 337.0 | 464.0 | 257.0 | 48.2 | 20.9 | 853.8 | 176.0 |
| 1887 | 31.8 | 364.5 | 572.0 | 251.4 | 53.7 | 22.6 | 755.6 | 242.4 |
| 1888 | 30.6 | 430.7 | 624.0 | 252.9 | 55.4 | 22.9 | 728.5 | 237.7 |
| 1889 | 29.0 | 560.8 | 630.0 | 266.8 | 65.8 | 24.0 | 764.9 | 214.8 |
| 1890 | 32.7 | 428.9 | 778.0 | 281.8 | 66.6 | 21.1 | 781.6 | 212.9 |
| 1891 | 33.4 | 398.5 | 725.0 | 298.3 | 74.8 | 24.4 | 939.0 | 214.8 |
| 1892 | 33.2 | 366.5 | 704.0 | 310.8 | 76.1 | 24.6 | 929.9 | 222.3 |
| 1893 | 33.2 | 348.0 | 723.0 | 324.6 | 79.7 | 25.9 | 902.8 | 225.2 |
| 1894 | 33.4 | 353.5 | 739.0 | 332.9 | 86.3 | 129.3 | 948.8 | 230.2 |
| 1895 | 35.4 | 328.3 | 710.0 | 342.6 | 80.6 | 118.1 | 905.1 | 237.3 |
| 1896 | 38.2 | 438.6 | 708.0 | 353.9 | 77.9 | 76.1 | 913.7 | 239.8 |
| 1897 | 40.5 | 375.5 | 767.0 | 379.1 | 83.6 | 113.5 | 948.5 | 266.1 |
| 1898 | 40.2 | 366.0 | 814.0 | 460.6 | 150.8 | 115.3 | 919.4 | 280.9 |
| 1899 | 44.1 | 351.3 | 852.0 | 417.2 | 293.7 | 117.2 | 954.1 | 277.5 |
| 1900 | 69.6 | 355.7 | 882.0 | 420.1 | 190.8 | 136.8 | 1,046.2 | 274.0 |
| 1901 | 121.0 | 372.3 | 1,007.0 | 427.6 | 205.1 | 110.1 | 1,071.2 | 292.1 |
| 1902 | 123.3 | 373.3 | 1,009.0 | 443.5 | 180.1 | 90.0 | 1,030.9 | 301.5 |
| 1903 | 100.6 | 361.6 | 979.0 | 464.8 | 201.2 | 155.1 | 1,010.9 | 309.0 |
| 1904 | 72.2 | 362.1 | 993.0 | 1,162.1 | 268.2 | 677.7 | 995.4 | 320.5 |
| 1905 | 66.0 | 377.4 | 1,059.0 | 1,632.1 | 243.7 | 741.4 | 1,031.1 | 322.4 |
| 1906 | 62.2 | 374.3 | 1,167.0 | 1,032.9 | 247.8 | 408.9 | 1,165.5 | 329.3 |
| 1907 | 59.2 | 404.9 | 1,366.0 | 679.1 | 246.9 | 241.9 | 1,137.7 | 341.8 |
| 1908 | 58.5 | 422.4 | 1,329.0 | 673.8 | 293.8 | 238.7 | 1,166.1 | 372.3 |
| 1909 | 59.0 | 467.6 | 1,373.0 | 647.9 | 308.0 | 202.6 | 1,218.8 | 473.3 |
| 1910 | 63.0 | 498.5 | 1,399.0 | 650.4 | 313.0 | 210.8 | 1,278.3 | 421.0 |
| 1911 | 67.8 | 577.0 | 1,391.0 | 671.4 | 317.1 | 232.0 | 1,534.3 | 408.4 |
| 1912 | 70.5 | 755.0 | 1,470.0 | 814.9 | 319.7 | 227.5 | 1,584.0 | 495.7 |
| 1913 | 72.5 | 1,000.0 | 1,909.0 | 961.5 | 335.4 | 219.6 | 1,815.1 | 600.0 |

*Source:* **Britain** B.R.Mitchell and P. Deane, *Abstract of British Historical Statistics*, Cambridge University Press, Cambridge (1962) Public Finance Tables pp. 397-398. Note that up to 1913, Indian military expenditures were paid for

by the Government of India. Therefore, these expenditures have not been included in the various British military expenditure estimates [1].

**Italy** 1870-1910: Stato Maggiore Dell'Esercito, *L'Esercito Italiano dall'Unità Alla Grande Guerra 1861-1918* (1980), Roma, Ufficio Storico, pp. 508-509.

1911-1913: G. Fuà, *Lo sviluppo economico in Italia: Storia dell'economia italiana negli ultimi cento anni,* Franco Angeli, Milano (1978), pp. 446. Note that the 1884 figure was taken from N. Choucri and R. North, "Nations in Conflict: Data on National Growth and International Violence for 6 European Major Powers, 1870-1914" (1985) InterUniversity Consortium for Political and Social Research (IUCPSR) No.7425, University of Michigan, Ann Arbor [Print-Out data base]. Whilst the figures used here for 1870-1913 include extraordinary with ordinary military expenditures, they omit military pensions, which should be included.

**Germany** S. Andic and J. Veverka, "The Growth of Government Expenditure in Germany since the Unification", *Finanz Archiv* Vol.23 Heft 2 (1964), Table A.22 p. 262. See also Peter-Christian Witt, *Die Finanzpolitik* Table 14, pp.380-381, details of which are provided in footnote 42 in the text above.

**Russia** P.A.Khromov, *Ekonomicheskoe razvitie Rossii v XIX-XX Vekakh 1800-1917,* Institute of Economics, Academy of Sciences, USSR (1950), pp. 514-529.

**America** *Historical Statistics of the United States: Colonial Times to 1970,* (1975), Department of Commerce, Bureau of the Census, Washington, Series Y457-465, p. 1114. *A Statistical Abstract Supplement to Historical Statistics of the United States: Colonial Times to 1957* (1961), U.S. Department of Commerce, Bureau of the Census, Washington, Series Y350-356, p. 718.

**Japan** *Estimates of Long-Term Economic Statistics of Japan since 1868.* (eds — K. Ohkawa, M. Shinohara and M. Umemura), "Government Expenditure" (K. Emi and Y. Shionoya). Toyokeizai Shimpo-Sha, Toyo (1966), Table 10 pp. 186-187, 212-213.

**France** *Annuaire Statistique de la France* Vol. 33 "Résumé Rétrospectif" (1913) pp. 140-141. See also *Annuaire Statistique* Résumé Rétrospectif (1914) Vol. 34. As noted in the text, these figures do **not** include extraordinary expenditures. My estimate would be that the average burden would be revised up to approximately 4.5% if they were included.

**Austria** Rainer von Kesslitz[2] "Die Lasten der Militärischen Rüstungen Österreich-Ungarn im Neuesten Zeit" (1868-1912). Kriegsarchiv, Vienna MS. Allg. Nr. 54 II. 45. 163 pp. 181-184, 387-388 (date unknown, but is probably 1912). Note that the 1913 figure was only approximate, and was calculated on the basis of 63.6% of the figure given in A. Paulinyi "Die Sogenannte Gemeinsame Wirtschaftspolitik in Österreich-Ungarn" in A. Wandruszka and P. Urbanitsch, *Die Habsburgermonarchie 1848-1918: Die Wirtschaftliche Entwicklung* Bd. 1 (1973), p. 574. It is important also to note that the joint military expenditures were provided on the basis of 70% contribution by Austria and 30% by Hungary up to 1908[3]. Thereafter the ratio changed so that Austria contributed 63.6% compared to Hungary's 36.4%.

[1] See "United Kingdom", *Encyclopedia Britannica* (London), 1911 [11th edition], pp. 606-608; W.S. Hamer, *The British Army* p. 90. P.K. O'Brien, *Costs and Benefits* p. 188. Also, B.R. Tomlinson, *The Political Economy of the Raj, 1914-1947: The Economics of Decolonization in India,* London (1979), pp. 27-8, 106.

[2] I am grateful to David Stevenson for this source.

[3] J. Wysocki "Die Österreichische Finanzpolitik" in A. Wandruszka and P. Urbanitsch (eds) *Die Habsburgermonarchie 1848-1918,* Bd. 1, pp. 68-105.

# APPENDIX 2

## *Currency Conversion and Population Data*

Currencies have been converted into sterling using the following pre-war parities:

Italy (1870-1913) = 25.221 Li
Germany (1870-1913) = 20.429 M
Russia (1897-1913) = 9.45 Rb
U.S. (1870-1913) = $4.867
France (1870-1913) = 25.22 Fr
Japan (1897-1913) = 10.0 Y=
Austria (1870-1913) = 24.02 Kr

Figures from R. L. Bidwell, *Currency Conversion Tables: A Hundred Years of Change,* Rex Collings, London (1970). Germany was on the gold standard by 1873. Thus we can assume that the mark was stable against the pound for the majority of the period in question here. The same is true of America, which went on to gold in 1879. France was on gold throughout this period. Although Austria did not go on to gold until 1892, nevertheless the gulden (up to 1892) and thereafter the krona remained remarkably stable against the pound[4]. Note that Italy did not go on to the gold standard in the 1870-1913 period. Nevertheless, the lira was sufficiently stable against the pound to warrant the use of the pre-war parity[5]. However the currencies of both Japan and Russia were radically different to the fixed and stable exchange rate regime that was adopted in 1897. The table below shows the annual conversion rates of Japan and Russia, which have been used up to 1896, with the parities used thereafter.

[4] See the exchange rate series in Jankovich Béla "Agio És Árakulás Az Osztrák-Magyar Monarchiában 1867-97-IG, Vonatkozás - Sal a Világpiacz Viszonyaira" *Közgazdasági Szemle,* Vol. 23 (1899) final column of table, p. 492.

[5] See the exchange rate series in M. Fratianni and F. Spinelli, "Italy in the Gold Standard Period, 1861-1914", in M.D. Bordo and A.J. Schwartz, *A Retrospective on the Classical Gold Standard,* Chicago University Press, Chicago (1984) Table 9 A.1, pp. 435-437. See also by the same authors, "Currency Competition, Fiscal Policy and the Money Supply process in Italy from Unification to World War 1", *Journal of European Economic History,* Vol. 14, No. 3 (1985) pp. 473-499.

Exchange Rates for Japan and Russia, 1870-1896

| Year | Russia | Japan |
|---|---|---|
| 1870 | 3.36 | 5.00 |
| 1871 | 3.12 | 5.00 |
| 1872 | 3.06 | 5.00 |
| 1873 | 3.08 | 5.00 |
| 1874 | 3.00 | 4.78 |
| 1875 | 3.05 | 4.95 |
| 1876 | 3.24 | 5.03 |
| 1877 | 3.85 | 4.98 |
| 1878 | 4.08 | 5.38 |
| 1879 | 4.13 | 5.47 |
| 1880 | 4.00 | 5.32 |
| 1881 | 3.97 | 5.38 |
| 1882 | 4.14 | 5.41 |
| 1883 | 4.22 | 5.41 |
| 1884 | 4.10 | 5.50 |
| 1885 | 4.14 | 5.78 |
| 1886 | 4.29 | 6.29 |
| 1887 | 4.67 | 6.29 |
| 1888 | 4.44 | 6.54 |
| 1889 | 3.94 | 6.41 |
| 1890 | 3.57 | 5.85 |
| 1891 | 3.78 | 6.10 |
| 1892 | 4.13 | 6.95 |
| 1893 | 3.97 | 8.00 |
| 1894 | 3.88 | 12.35 |
| 1895 | 3.88 | 9.62 |
| 1896 | 3.88 | 9.35 |

*Source:* **Japan:** T. Nakamura, *Economic Growth*, Table 1.20 pp. 33-34. Note that the figures were not produced for the years 1870-1873. We have therefore assumed an exchange rate of Y=5.0 for these years. **Russia** Calculated from *L.B. Yeager* "Fluctuating Exchange Rates in the Nineteenth Century: The Experiences of Austria and Russia" in *R.A. Mundell and A.K. Swoboda* (eds), *Monetary Problems of the International Economy*, University of Chicago Press, London (1969) Table 7, p. 85.

The population figures have been taken from the following sources:

**Britain** - P. Flora, *State, Economy and Society in Western Europe: The Growth of Industrial Societies and Capitalist Economies* Vol. 2, Macmillan, London (1987), pp. 80, 81, 84, 85, 88, 89; **Italy** - P. Flora, *Growth of Industrial Societies*, pp. 63-64; **Germany** - Andic and Veverka, *"Growth of Government Expenditures"*, p. 238; **Russia** - P. A. Khromov, *Ekonomicheskoe razvitie*, p. 452, 454 (taken from the Russian Statistical Yearbook, 1st ed., 1918, p. 85); **U.S.** *Historical Statistics of the United States: Colonial Times to 1970* (1975), U.S. Department of Commerce, Bureau of the Census, Washington, Series A6-8 p. 8; **Japan** - M. Umemura and K. Akasaka, *Estimates of Long-Term Economic Statistics of Japan since 1868*, Vol. 2 [Manpower] 1988, pp. 166,168; **Austria** - P. Flora, *Growth of Industrial Societies* pp. 38.

# APPENDIX 3

## *National Income of the Great Powers 1870-1913 (in individual national currencies)*

| Year | Britain (£m) | Italy (Li m) | Germany (Marks m) | Russia (Rb m) | America ($m) | Japan (¥m) | France (Fr m) | Austria (Kr m) |
|---|---|---|---|---|---|---|---|---|
| 1870 | 936 | 8,308 | 10,433 | — | 6,264 | — | 18,738 | 2,989 |
| 1871 | 1,015 | 8,347 | 11,329 | — | 6,264 | — | 19,308 | 3,376 |
| 1872 | 1,072 | 9,404 | 12,748 | — | 6,264 | — | 20,294 | 3,438 |
| 1873 | 1,149 | 10,753 | 13,979 | — | 6,986 | — | 20,106 | 3,292 |
| 1874 | 1,126 | 10,468 | 14,718 | — | 6,986 | — | 20,977 | 3,571 |
| 1875 | 1,113 | 9,003 | 14,234 | — | 6,986 | — | 20,597 | 3,569 |
| 1876 | 1,099 | 9,161 | 14,535 | — | 6,986 | — | 20,354 | 3,713 |
| 1877 | 1,089 | 10,121 | 14,219 | — | 8,533 | — | 20,453 | 3,970 |
| 1878 | 1,059 | 9,405 | 14,004 | — | 8,533 | — | 19,351 | 4,256 |
| 1879 | 1,032 | 9,323 | 13,746 | — | 8,533 | — | 19,171 | 4,093 |
| 1880 | 1,076 | 9,775 | 14,435 | — | 8,533 | — | 20,406 | 4,247 |
| 1881 | 1,117 | 8,865 | 14,650 | — | 8,533 | — | 21,809 | 4,525 |
| 1882 | 1,160 | 9,406 | 14,795 | — | 10,357 | — | 22,610 | 4,545 |
| 1883 | 1,153 | 8,859 | 15,472 | — | 10,357 | — | 21,635 | 4,845 |
| 1884 | 1,124 | 8,839 | 15,778 | — | 10,357 | — | 20,522 | 5,130 |
| 1885 | 1,115 | 9,127 | 15,928 | 5,927 | 10,357 | 735 | 19,921 | 5,113 |
| 1886 | 1,136 | 9,531 | 16,279 | 5,528 | 10,357 | 721 | 19,702 | 5,431 |
| 1887 | 1,185 | 9,037 | 17,140 | 6,798 | 11,063 | 714 | 19,882 | 5,740 |
| 1888 | 1,259 | 8,835 | 18,051 | 7,076 | 11,063 | 701 | 20,389 | 5,755 |
| 1889 | 1,350 | 9,581 | 19,158 | 6,277 | 11,063 | 769 | 20,475 | 5,951 |
| 1890 | 1,385 | 10,165 | 20,590 | 6,360 | 11,063 | 1,066 | 21,221 | 6,643 |
| 1891 | 1,373 | 10,288 | 20,470 | 6,083 | 11,063 | 920 | 21,718 | 7,002 |
| 1892 | 1,335 | 9,354 | 21,043 | 7,040 | 11,880 | 973 | 21,975 | 7,264 |
| 1893 | 1,339 | 9,602 | 21,144 | 7,431 | 11,880 | 991 | 21,535 | 7,193 |
| 1894 | 1,418 | 9,388 | 21,297 | 7,800 | 11,880 | 1,192 | 21,441 | 8,024 |
| 1895 | 1,447 | 9,983 | 21,784 | 7,131 | 11,880 | 1,309 | 20,813 | 8,417 |
| 1896 | 1,484 | 9,834 | 22,978 | 7,887 | 11,880 | 1,351 | 20,771 | 8,700 |
| 1897 | 1,538 | 9,592 | 24,732 | 8,532 | 15,185 | 1,653 | 22,152 | 8,830 |
| 1898 | 1,618 | 10,814 | 26,503 | 9,527 | 15,185 | 2,119 | 23,885 | 9,831 |
| 1899 | 1,700 | 10,736 | 27,475 | 10,570 | 15,185 | 1,846 | 24,346 | 10,142 |
| 1900 | 1,750 | 11,591 | 28,855 | 10,442 | 15,185 | 2,112 | 25,145 | 10,114 |
| 1901 | 1,727 | 11,810 | 28,241 | 10,862 | 15,185 | 2,125 | 24,628 | 10,720 |
| 1902 | 1,740 | 11,381 | 29,128 | 12,139 | 21,428 | 2,044 | 23,802 | 11,011 |
| 1903 | 1,717 | 12,530 | 30,505 | 11,278 | 21,428 | 2,391 | 25,275 | 11,127 |
| 1904 | 1,704 | 12,123 | 32,023 | 12,635 | 21,428 | 2,431 | 25,509 | 11,508 |
| 1905 | 1,776 | 12,938 | 34,310 | 11,839 | 21,428 | 2,419 | 26,595 | 13,090 |
| 1906 | 1,874 | 13,900 | 36,170 | 11,814 | 21,428 | 2,827 | 27,632 | 14,172 |
| 1907 | 1,966 | 15,105 | 38,664 | 12,642 | 27,496 | 3,172 | 29,942 | 15,581 |
| 1908 | 1,875 | 14,849 | 38,542 | 14,268 | 27,496 | 3,218 | 29,211 | 15,710 |
| 1909 | 1,907 | 16,130 | 39,508 | 15,243 | 27,496 | 3,144 | 30,064 | 15,977 |
| 1910 | 1,984 | 16,383 | 41,885 | 16,061 | 27,496 | 3,124 | 31,711 | 16,377 |
| 1911 | 2,076 | 17,752 | 44,194 | 15,629 | 27,496 | 3,741 | 34,069 | 17,216 |
| 1912 | 2,181 | 18,648 | 47,298 | 18,244 | 34,600 | 4,135 | 37,736 | 18,907 |
| 1913 | 2,265 | 19,752 | 48,806 | 18,746 | 34,600 | 4,299 | 38,109 | 18,764 |

*Sources:* As explained in the text, national income has been reduced down to the basic concept of **net national product at factor cost**[6].

**Britain** C.H. Feinstein, "Income and Investment in the United Kingdom, 1856-1914", *Economic Journal*, No. 282, Vol.71, (June) 1961 p. 374.

**Italy** G. Fuà, *Notes on Italian Economic Growth, 1861-1914*, Milan, 1965, pp. 61-2. These figures are presented in 1938 prices. They were deflated to current prices using the price index in P. Ercolani, "Documentazione statistica di base" in G. Fuà, *Lo sviluppo economico*, pp. 437-438.

**Germany** W.G. Hoffmann, *Das Wachstum der Deutschen Wirtschaft seit der Mitte des 19 Jahrhunderts*, Springer Verlag, New York, 1965 Table 122, pp. 506-9.

**Russia** P.R. Gregory, *Russian National Income, 1885-1913*, Cambridge University Press, Cambridge, 1982, Table 3.2 pp. 58-59. To reduce these figures from market prices to factor cost, indirect taxes and government enterprise surplus were subtracted. These figures were supplied by P.A. Khromov, *Ekonomicheskoe razvitie*. Finally "subsidies" to the private sector are added on. Because these figures are unavailable for the whole period, an approximate figure of 50m roubles for the years 1885-1900 and 100m roubles for the years 1901-1913 have been used. These figures accord approximately with those produced by Gregory in his chart F1, Appendix F (p. 252) Col. 7. Gregory has calculated NNP at factor cost for the year 1913 as 18,701m compared to the present estimate of 18,746 (or a 0.2% differential)[7].

**America** *A Statistical Abstract Supplement to Historical Statistics of the United States: Colonial Times to 1957* (1961), U.S. Department of Commerce, Bureau of the Census, Washington, Series F104-130, p. 143. These figures are based on the data of Simon Kuznets[8]. Because Kuznets omits military expenditures from his NNP figures they have been added on, in order to achieve consistency with the remaining data sets used here.

**Japan** K. Ohkawa and M. Shinohara, *Patterns of Japanese Economic Development: A Quantitative Appraisal*, Yale University Press, London, 1979, Table A7, pp. 266-7. However, these data were produced only at market prices. Indirect taxes, government enterprise surplus and subsidies were taken from K. Emi and Y. Shionoya, *Estimates of Long-Term Economic Statistics of Japan since 1868*, Vol. 7, "Government Expenditures", Toyokeizai Shimpo-Sha, Toyo, 1966, Table 7G, pp. 172, 174-5.

**France** M. Lévy-Leboyer and F. Bourguignon, *The French Economy in the Nineteenth Century: An Essay in Econometric Analysis*, Cambridge University Press, Cambridge, 1990, Table A-1, pp. 315-7.

**Austria** Because there are no figures for all years prior to 1913 for Hungary, we have dealt only with Austria. In this context, the most complete set of figures is produced by A. Kausel, "Österreichs Volkseinkommen 1830 bis 1913", in A. Wandruszka and P. Urbanitsch, *Die Habsburgermonarchie*, vol. 1, pp. 692-693.

Note however that these data are not NNP but GDP. These have not been depreciated nor aggregated with income from abroad, mainly because the military expenditure figures include the spending made by Bosnia-Herzegovina, which probably represented about 5% of the total. By using the GDP figure, we can effectively absorb the Bosnia-Herzegovina military spending figure.

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[6] Note that a more detailed explanation of the NNP data is provided in Hobson and Hall "Britain's Military Burden" appendix 2.

[7] Note however that the use of budgetary data with which to reduce NNP from market prices to factor cost, is less accurate than the methodology used by Gregory when he calulated NNP at factor cost for the year 1913, (though not by much).

[8] S. Kuznets, "Long Term Changes in the National Income of the United States: Trends and Structures" (Series 2), Bowes and Bowes, Cambridge, (1952). Kuznets, *National Product since 1869* (1946), NBER, New York, Table 2.1, p. 86.