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# TRADE STATISTICS OF THE ZOLLVEREIN, 1834-1871<sup>1</sup>

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The purpose of this paper is to highlight the fact that the lack of useable German trade statistics for the period preceding the German political unification is not a fatality. The documents published during the Zollverein period by the Central Bureau of the Zollverein, the *Statistische Uebersichten über Waaren-Verkehr und Zoll-Ertrag im Deutschen Zoll-Vereine für das Jahr...*, do not provide prices nor trade flows in value nor any indication of countries of ultimate origin and destination. To overcome these imperfections, a great number of estimates of Zollverein trade statistics have been published since 1842 but they are questionable as well. Nevertheless, the good quality of *Statistische Übersichten's* quantity data should make possible the reconstruction of consistent series of German trade, total, by product and in value, over the period 1834-1871.

*Keywords:* administrative history, nineteenth century, international trade statistics, Germany, globalization, economic history, Zollverein.

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Germany is a very special case in the history of trade statistics. For the eighteenth century there are virtually no contemporary trade statistics, as Pfister notices in this issue.<sup>2</sup> He is nevertheless able to provide a consistent picture of German foreign trade between c. 1740 and the 1790s by using documents from Bavaria, Prussia, Hanover, and Hamburg. The creation of a German customs union in 1834 led to the creation of a Central Bureau and to the

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1. I would like to thank Markus Lampe for useful advices and Ulrich Pfister for very helpful comments.

2. Pfister (2015), in this issue.

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first elaboration of “a” German trade statistics, i.e. trade statistics of a unified German entity with the outer world excluding intra-German states trade flows. Data were published in the first German official document dedicated to the collation of trade information, the *Statistische Uebersichten über Waaren-Verkehr und Zoll-Ertrag im Deutschen Zoll-Vereine für das Jahr...* But this document is well known among German trade experts for its many shortcomings, particularly the absence of any information on price or the value of trade flows. Germany did not produce “useable” trade statistics before 1872, namely statistics of exports and imports in value. Until the end of the nineteenth century there was no German publication equivalent to the *Tableau général du commerce de la France* or the *Annual Statement of Trade of the United Kingdom*.

Discussions of Zollverein’s trade statistics have so far been available only to German-speaking researchers. The purpose of this article is to make use of these publications to shed light on documents that have been progressively abandoned by economic historians.<sup>3</sup> It is divided into three sections that present the collection of trade statistics in the Zollverein, describe the information contained in the *Statistische Übersichten*, and make a review of the estimates of German trade in the nineteenth century.

## 1. The collection of trade statistics in the Zollverein

The formation of the German Zollverein was a gradual process that took seven decades from the 1818 Prussian customs reform to the latest accession of Bremen and Hamburg in 1888. The Zollverein was officially established by the Zollverein treaties of 1833 that merged three German customs unions including twenty one German states in a common customs system. After its implementation in January 1, 1834 for a period of eight years tacitly renewable every twelve years, six other German states joined the union over the 1835-1852 period. After the unification wars of 1866 and 1870, six new territories integrated the Zollverein and the process ended in 1888 with the entry of Hamburg and Bremen.<sup>4</sup>

The aim of Prussia and its cosignatories was to establish a free trade area with a common tariff and a common commercial policy,

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3. But not all, see Lampe (2008).

but this objective has not resulted in the creation of truly federal institutions. In fact, the main federal organ of the Zollverein was the *Generalkonferenz*, an assembly of plenipotentiaries of the Zollverein governments which met once a year to discuss problems relating to the customs union. Decisions were taken unanimously. The other federal-like administration was the Central Bureau, which function was to calculate the distribution of custom revenues between the Zollverein members. It must be stressed that, as a customs union, the Zollverein was not as integrated as the European Economic Community, which has established common institutions for implementing the common commercial policy. In the Zollverein, while Prussia played a leading role throughout the period, each member state retained jurisdiction over the administration of its customs, used its own customs officers at the external and internal borders of the union, and kept its own customs revenues fund. This model of “loose” customs union may have influenced the elaboration of trade statistics in the Zollverein.<sup>5</sup>

The first motivation to the centralization of trade statistics by the Central Bureau was the calculus of each member’s share in the common customs revenues.<sup>6</sup> But soon enough, it became clear that the establishment of a statistics of the external trade of the Zollverein also provided a strong motivation. To these end the *Commerzialnachweisungen* were elaborated as soon as 1834 to set up a common list of merchandises and a common way of collecting the information. A common instruction for the collection of data was communicated to the Ministry of Finance of each state in 1836; it was revised in 1841. The merchant had to declare the quantity and nature of the merchandise, not the value that was considered as too difficult for merchants and customs officials. The

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4. The 1833 treaty of the Zollverein may be found at: <http://www.verfassungen.de/de/de06-66/zollverein33.htm>. The founding members were Prussia, Hesse-Darmstadt (Prussia-Hesse-Darmstadt Custom Union, 1828), Kurhessen, Bavaria, Württemberg (Bavaria-Württemberg Customs Union, 1828), Saxony, and the states of Thuringia (Thuringian Customs Union). The following states joined the Zollverein: Baden and Nassau (1.1.1836), Frankfurt (1.2.1836), Brunswick (1.1.1842), Luxemburg (1.4.1842), Hanover, Oldenburg, Schaumburg-Lippe (1.1.1854), Schleswig-Holstein (15.11.1867), Lauenburg, Mecklenburg Schwerin, Mecklenburg Strelitz, Lubeck (over 1868), Alsace-Lorraine (1.1872), Hamburg and Bremen (15.10.1888). (Dates in brackets are those of the entry in the Zollverein).

5. See Dedinger (2012a).

6. See Borries (1970), 22-26; *Statistik des deutschen Reiches* (1873), vii-ix; Zimmermann (1905), 302-305.

task of the customs official did not require any particular qualification; he had to register each commodity with an alphabetical list consisting of 250 tariff lines. The data collected by each member of the Zollverein were checked by the other members. They were next sent to and added up by the Central Bureau in Berlin.<sup>7</sup> The role of the Central Bureau was thus limited to that of an accountant until the foundation of the Second Reich and the creation of the *Kaiserliches Statistisches Amt* in 1872. The documents it issued, the *Commerzialnachweisungen*, were not used to discuss Zollverein's trade policy.

In fact the huge mass of data<sup>8</sup> collected by the Central Bureau was not easily manageable, especially on the import side. Imports were divided into many categories that could not be added and could contain duplicates. The categories are: imports for direct consumption, transit (complicated system of certificates), warehouse goods (not systematically registered in imports), trade with fairs, postal trade, processing trade, transit on short roads, *Harz-Leine-Distrikt* trade,<sup>9</sup> and special tables for reduced tariffs (trade with Switzerland, Austria and the Netherlands for example). On the other side, exports were registered under the three traditional main categories: goods coming from domestic production, transit, goods coming from warehouse (postal trade not included).

The lack of interest in common trade statistics by the states of the Zollverein is also reflected by the fact that the publication of the *Nachweisungen* was not decided before 1843. The mass of information gathered by the Central Bureau was initially reserved for use by the governments and it was not meant to be made public. This led to unofficial estimates of German trade<sup>10</sup> that were criticized for their inaccuracy at the 1843 *Generalkonferenz*. It was then decided to publish the official documents. The *Statistische Uebersichten über Waaren-Verkehr und Zoll-Ertrag im Deutschen Zoll-Vereine für das Jahr...* that was first published in 1844 (year 1842) is

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7. Borries (1970), 22-23. As Borries points out, there is no detailed study of the methods used by the Zollverein states to collect and check trade statistics.

8. Borries (1970), 24.

9. This Brunswick district cut through the Hanover territory. From the inclusion of Brunswick (1844) to the annexation of Hanover (1854), the Harz-Leine-Distrikt trade was subjected to tariffs lower than those of the Zollverein.

10. See below section 3.

only a small part of all the information contained in the *Commerciálnachweisungen*. It was edited by the *Central-Bureau des Zoll-Vereins nach den amtlichen Mittheilungen der Zoll-Vereines-Staaten*. 1873 (year 1871) is the last year of edition. The document was then replaced by the *Auswärtiger und überseeischer Waarenverkehr des deutschen Zollgebiets und der Zollausschlüsse*.<sup>11</sup>

## 2. A closer look at the *Statistische Übersichten*

Once it was made available to the public, the *Statistische Übersichten* was subjected to severe criticism. According to the *Journal des Economistes* this document was incomplete, useless and unworthy of a government concerned with public information.<sup>12</sup> More neutral and “diplomatic” the comment of the *Annales du commerce extérieur*<sup>13</sup> is nevertheless worth noticing. During thirty years, each report on the external trade of the Zollverein begins by highlighting the same drawback, the fact that customs official statements do not record the value of commodities. On the German side also statisticians lamented about the poor state of German trade statistics until the reform of 1872.<sup>14</sup> A hundred years later the imperfection of the Zollverein statistics motivated the works of Bondi and Borries.<sup>15</sup> As summarized by Bondi, there are

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11. Published in *Statistik des Deutschen Reiches*, Alte Folge 1872-1882, Neue Folge 1883-1944; edited by the *Kaiserliches Statistisches Amt*; from 1891 onwards its title is *Auswärtiger Handel des deutschen Zollgebiets*.

12. “La Prusse publie depuis trois ans un tableau des exportations et des importations de l'Association des Douanes [...]. Ce document est fort incomplet; l'on y chercherait en vain des résumés propres à faire connaître le mouvement commercial par pays ou par catégories de marchandises [...]. Nous déclarons qu'il est tout à fait indigne d'un gouvernement qui a la prétention d'informer le public, car il n'apprend absolument rien, et ne peut servir ni aux fonctionnaires publics ni aux économistes; encore moins peut-il éclairer les hommes qui n'appartiennent ni à l'une ni à l'autre de ces catégories”, in *Le Journal des Economistes*, Tome 13, Déc. 1845-Mars 1846, 326. This comment is cited in Junghanns (1848), vii.

13. The *Annales du commerce extérieur* provide statistical information on the external trade of foreign countries. From 1829 to 1916 it is divided into four series: *Extraits d'Avis Divers*, 1829-1839; *Bulletin du Ministère de l'Agriculture et du Commerce*, 1840-1842; *Faits commerciaux*, 1843-1883; *Mouvement général du commerce et de la navigation des principaux pays étrangers*, 1884-1916. 33 booklets on the German Zollverein are published from 1843 (*Association allemande, Faits commerciaux n° 1*, février 1843) to 1873 (*Association allemande, Faits commerciaux n° 33*, juillet 1873) in which no official value of German foreign trade can be given. French consular reports had to rely on unofficial estimates.

14. Junghanns (1848), iii-viii. In his foreword, he is very critical of the work of the Central Bureau. Twenty years later, the judgement is still quite tough: “We have no German trade statistics and have never had something that could deserve such a name” (author's translation), in Hirth (1869), 67. Hirth was member of the Commission of reform of the statistics from 1869 to 1870.

four major shortcomings: no indication of value, no coverage of all the exports and imports, no satisfactory classification of goods, no indication of partner country.<sup>16</sup>

After noticing what is not in the *Statistische Übersichten*, it is interesting to know what information can actually be found in these tables. The documents are available and can be downloaded online.<sup>17</sup> The language is German. The first edition of the *Statistische Übersichten* (1844) includes an appendix retracing trade of the Zollverein over 1834-1843 (208-261). From 1842 to 1871, there was no indication of value or price. Data are given in different quantity units, mostly in *Centner*, but also in *Stück*, *Klafter*, *Scheffel*, *Schiffslast*, *Tonnen*, *Ohm* and *Pferdelasten*.<sup>18</sup> According to the German statisticians these data are quite reliable and the problem of smuggling is reduced compared to other countries.<sup>19</sup> Two periods must be distinguished. Until 1857 (ed. 1859) information is divided into the following sections: goods cleared at the frontier imported by each state of the Zollverein; goods exported by each state of the Zollverein; goods transiting in each state of the Zollverein; import, export and transit of goods in the *Harz-Leine-Distrikt*; re-imports of domestic goods; foreign fairs' trade with German states; German fairs' trade with the outside; tables of customs revenues. From 1858 (ed. 1860), the size of the document increased significantly. It was now classified in three sections. I. imports and customs revenues in the Zollverein and each German state by border country; exports and customs revenues in the Zollverein and each German state by border country. II. Transit trade in the Zollverein and each German state by border country on entry and exit. III. Summary of trade; trade of small ports (Ostsee, Nordsee, Prussian ports, Hanover, Oldenburg); trade of fairs; tables of customs revenues.

Trade statistics of the Zollverein are said to be incomplete because they did not register duty-free goods. In particular, waste

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15. Cf. Bondi (1958), 149-150, Borries (1970), 22-25. Kutz (1974) was concerned with German trade statistics before the creation of the Zollverein.

16. Bondi (1958), 149.

17. The Bayerische Staatsbibliothek is currently processing the digitization of the *Statistische Übersichten* for the years 1842-1862. See: <https://opacplus.bsb-muenchen.de/metaopac/>

18. Prussian Centner (100 kg) before 1840 and Zoll Centner (50 kg) after.

19. Hirth (1869), 68-69.

products, products of horticulture, agriculture and livestock, hay, straw, fodder herbs, fresh herbs, fresh fruit, milk and eggs, tree seeds, fresh fish, bread, a large number of earth and ores, mill and other carved stones, firewood, and timber in land transport were excluded from trade statistics.<sup>20</sup> But according to a careful review by Borries, the total value of non-registered exports and imports should not have exceeded two million Thalers.<sup>21</sup> The classification of merchandises remains relatively stable over the whole period. There are 43 main categories plus a 'miscellaneous' group, and about 250 positions in total.<sup>22</sup> It seems that this quite simplistic classification should facilitate the work of customs officials and merchants by being easy to use. The categories for colonial and agricultural products provide an adequate degree of precision, but those for raw materials, semi-finished and finished goods are less disaggregated and mix products of different nature.<sup>23</sup> Another feature of these statistics is non-homogeneity due to the changing definition of the Zollverein throughout the period.<sup>24</sup>

In 1858 (ed. 1860) the contents of the publication changed to include some simplifications and new information, but this reform did not solve any major defect of the Zollverein statistics.<sup>25</sup> The main evolution was that the border country through which the goods enter or exit was now specified. The border approach was mostly used to register partner countries at that time.<sup>26</sup> In the case of the Zollverein the problem of the determination of bilateral trade was complicated by the fact that free ports such as Hamburg were not included in the Zollverein and reported as foreign partners (see below an extract of the *Statistische Übersichten*). "Hence", as Lampe rightly points out, "most seaward trade with the Zollverein/Germany was accounted to as coming from or going to

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20. Statistik des Deutschen Reiches (1873), x. *Abfälle verschiedener Fabrikationszweige, gewisse Erzeugnisse des Garten- und Ackerbaus und der Viehzucht, Heu, Stroh, Futterkräuter, frische Gartengewächse, frisches Obst, Milch und Eier, ferner Waldsämereien, frische Fische, Brod, eine grosse Anzahl von Erden und Erzen, Mühl- und andere behauene Steine, Brenn-, Bau- und Nutzholz bei Landtransport.*

21. Borries (1970), 28-29.

22. Lampe (2008) relies on the *Statistische Übersichten* to reconstruct German bilateral trade by products in 1857 and 1865. According to his counting (85) there is an increase in the number of positions in 1865 where separate statistics were published for each semester.

23. Borries (1970), 26-27.

24. Cf. note 3.

25. Zimmermann (1908), 304-305.

26. See Lampe (2008), 101.

the free-ports of Hamburg and Bremen and smaller free-ports in the states of Hanover (since 1866 Prussia) and Oldenburg. For the smaller share of sea trade through national ports that were not free ports, i.e. Prussian ports in the North and Baltic Sea, geographical distribution on origins and destinations was published since 1858 in separate tables, whose sums except for supposed transmission and printing errors matched the sum of trade reported in the main tables.<sup>27</sup> German official documents began to indicate ultimate countries of origin and destination in 1880 only.<sup>28</sup> But it is not until the annexation of Bremen and Hamburg in the Zollverein that German statistics converged toward a comprehensive description of German trade flows with the rest of the world. This is confirmed by the shift in German trade statistics between 1888 and 1889. First, the total value of special imports sharply increased (+ 22%) showing that German imports from Hamburg were inferior to Hamburg total imports, whereas total exports slightly declined (-1.3%). Second, the consequences of the inclusion were quite important on the structure of bilateral trade since Hamburg represented about 20% in German total measured trade in 1888 (exports = 24%; imports = 16%). Indeed, between 1888 and 1889, a sharp increase in the share of non-continental countries (United Kingdom, United States, Brazil, Chili and India) occurred.<sup>29</sup>

Given all its shortcomings, the publication of the *Statistischen Übersichten* did not put an end to unofficial estimates of German trade. Over more than a century there have been many attempts to reconstruct statistics of the Zollverein in value that are reviewed in the next section.

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27. Lampe (2008), 102.

28. *Auswärtiger Handel* (1898).

29. Dedinger (2012b), 39-40.

Table 1. Extract from *Statistische Uebersichten über Waaren-Verkehr und Zoll-Ertrag im Deutschen Zoll-Vereine für das Jahr 1852*

Vereins-Staaten.	Gesamte Eingangs-Verzollung				
	1.	2. Baumwolle und Baumwollen-Waaren.			
	Abfälle von Glashütten, dergl. Scherben und Bruch von Glas und Porzellan etc.	a. Rohe Baumwolle.	b. Baumwollengarn, ungemischt oder gemischt, mit Wolle oder Leinen.		c. Baumwollne Stuhl- und Strumpf-Waaren etc.
			1. ungebleichtes, ein- und zwei-drätiges und Matten.	2. ungebleichtes, drei- und mehr-drätiges, engl. oder gewirnte etc. Garn.	
Centner	Centner	Centner	Centner	Centner	
Tariffsaß	frei.	frei.	3 <i>Kopf</i>	8 <i>Kopf</i>	50 <i>Kopf</i>
1. Preußen . . . .	83,766	373,829	347,926	1,496	2,923
Außerdem:					
Sachsen . . . .	64	354	322	19	36
2. Bayern . . . .	2,274	29,613	14,224	105	254
3. Sachsen . . . .	5,167	116,161	61,535	360	3,117
4. Württemberg .	503	39,191	6,798	64	170
5. Baden . . . . .	4,966	81,633	5,670	112	135
6. Kurf. Hessen .	4,462	418	1,745	68	11
7. Großh. Hessen.	188	395	2,465	71	64
8. Thüringen . . .	99	310	14,023	21	6
9. Braunschweig .	2,406	26,405	735	45	96
10. Nassau . . . . .	1	24	407	.	5
11. Frankfurt a. M.	1,116	902	8,490	858	769
Summa	105,012	669,235	464,340	3,219	7,586

Gesamte Eingangs-Verzollung in jedem einzelnen Vereins-Staate und im Gesamt-Verein, im Jahre 1852.

Table 2. Extract from *Statistische Uebersichten über Waaren-Verkehr und Zoll-Ertrag im Deutschen Zoll-Verein für das Jahr 1858*

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Bezeichnung der Waaren.	Gingegangen über die Grenze gegen	Im ganzen Zoll-Verein.			B o n				
		Gesamt- Gingang. Gentner	In freien Verkehr treten. Gentner	Erhobener Zoll-Betrag. Thaler	Preussen.		Außerdem: Luxemburg.		Bayern
					Gesamt- Gingang. Gentner	In freien Verkehr treten. Gentner	Gesamt- Gingang. Gentner	In freien Verkehr treten. Gentner	Gesamt- Gingang. Gentner
Pos. 6 f. 4.	Rußland und Polen	93	82	.	93	82	.	.	.
Ganz grobe	Oesterreich . . . .	5,242	1,339	.	718	799	.	.	3,489
Eisenguß-	do. im Zwisch.-Verf.	4,865	919	.	234	241	.	.	491
waaren in	die Schweiz . . . .	40,969	31,208	.	.	951	.	.	13,223
Lefen, Plät-	Frankreich . . . .	25,459	38,117	.	5,281	7,176	.	503	5,349
ten, Sittern	Belgien . . . . .	22,243	15,238	.	22,243	12,600	.	666	.
u.,	Niederlande . . . .	54,758	62,728	.	35,015	38,544	.	.	1,583
zu 1 Tht.	Bremen . . . . .	20,270	9,771	.	130	1,161	.	.	84
Aus Oesterr.	Hamburg . . . . .	45,351	46,427	.	17,289	18,949	.	.	4,470
im Zw.-Verf.	Mecklenburg . . . .	135	106	.	127	99	.	.	.
zu 15 Sgr.	Sachsen u. Posen	2	8	.	.	.	.	.	.
	die Nordsee . . . .	52,338	39,537	.	.	11,273	.	.	.
	die Ostsee . . . . .	41,391	18,399	.	41,391	18,399	.	.	.
	Oestermünde . . . .	4	4	.	.	.	.	.	.
	Brake . . . . .	98	76	.	.	.	.	.	.
	aus fr. Niederlagen	390	20	.	.	5	.	.	.
	von Meffen . . . . .	.	.	.	.	.	.	.	.
	aus Transitlagern	.	.	.	.	.	.	.	.
	aus Creditlagern.	.	.	.	.	.	.	.	.
	Post-Verkehr . . . .	30	30	.	8	8	.	.	1
	Zusammen	313,638	264,009	263,550	122,529	110,287	.	1,169	28,690

Uebersicht des Waaren-Einganges und der erhobenen Eingangszölle in sämtlichen Staaten des Zollvereins nach den Grenzstrecken des Einganges für das Jahr 1858.

### 3. The estimates of the value of German trade in the nineteenth century

Over the whole period from the foundation of the Zollverein to the unification of Germany, German statisticians produced estimates on the Zollverein trade. In the context of the European trade policy debate, when free trade was fiercely debated, the economic union of German states was not able to advance any synthetic figures to establish if it was invaded by foreign goods or vice versa.<sup>30</sup> Hence several authors attempted to fill this statistical hole by producing estimates, which Borries had analysed thoroughly.<sup>31</sup> Many attempts to estimate the value of the Zollverein trade for a

30. See Junghanns (1848b), 46-47. He was a fervent free-trader.

31. Borries (1970), 33-52.

given year were done but few authors produced continuous series. Dieterici, who was appointed director of the Prussian statistical office in 1844, published the “*Statistische Uebersicht der wichtigsten Gegenstände des Verkehrs und Verbrauchs im preussischen Staate und im deutschen Zollvereine*” from 1838 to 1857. It was the continuation of the Ferber’s “*Beiträge zur Kenntnis des gewerblichen und commerciellen Zustandes der preussischen Monarchie.*”<sup>32</sup> In the six volumes of Dieterici’s Übersichten, value estimates appeared in the 1842, 1844, 1857 editions for the years 1837-39, 1840-42, 1849, and 1853.<sup>33</sup> Dieterici used average prices from Prussia and Hesse, with identical prices for exports and imports, to calculate the export or import surplus for each position of the classification. This work is worth mentioning for its precursory character. However, the method used to set prices is too vague and the estimates are not considered reliable. A second set of estimates, based on Austrian prices, must also be used with caution.<sup>34</sup>

The works that made a more lasting mark are those of Junghanns and Hübner.<sup>35</sup> In 1848 Junghanns relied on Biersack’s prices<sup>36</sup> and *Statistische Übersichten’s* quantities to estimate the value of special exports, special imports and transit by products for the years 1834 to 1846. His series used the same unit values for each year.<sup>37</sup> Four years later, Hübner published the first of the eight volumes of his *Jahrbuch*.<sup>38</sup> In the section devoted to the *deutsche Zollverein*, Hübner provided annual estimates of special imports, special exports, and transit, by products, over 1850-1861. He relied on different price sources to calculate current values (identical prices are used for exports, imports and transit): German or foreign prices; Hamburg prices; reports of merchants and industrialists.<sup>39</sup>

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32. Dieterici (1838), iii-viii. After the death of Ferber, Dieterici continued his work and extended the statistical overview to all members of the Zollverein and to production activity.

33. Dieterici (1842), 405-407; Dieterici (1844), 634-635; Dieterici (1857), 829-839.

34. Reden (1847) used Austrian prices to estimate the total value of Zollverein exports, imports and transit over 1843-1845. His figures, considered to be overvalued, are published in the *Annales* (Association allemande, Faits commerciaux n° 10, Mai-juin 1848).

35. Cf. Borries (1970), 37-41; Hirth (1869) 110.

36. Developed in Borries (1970), 34-35. Biersack estimated average prices for imports and exports over 1837-1841. His data are the first estimate of the value of Zollverein trade given by the *Annales* (Association allemande, Faits commerciaux n° 5, juillet 1844).

37. Junghanns (1848), zweite Abteilung.

38. *Jahrbuch für Volkswirtschaft und Statistik* (1852-1863). Hübner is also the author of the *Statistische Tafel aller Länder der Erde* (1850-1912).

Two other estimates have been attempted before the unification of Germany by Bienengräber and Hirth for Zollverein trade in 1864 and 1867.<sup>40</sup> Hirth has been quite critical of the method of valuation of all these estimates, but it should be underlined that the problem is not specific to estimates of German trade: the issue of the valuation of trade arose in all countries at this time.

A hundred years later, several researchers undertook the task of revising these first evaluations and produced new series of external trade flows. Bondi reported the value of total exports and imports of the Zollverein over the period 1834-1871. His time series are taken from Junghanns (1834-46), Hübner (1850-61) and Bienengräber (1864). The missing points are estimated from the *Statistische Übersichten*. The territory is that of the Zollverein in its current borders.<sup>41</sup> His work has been strongly criticized by Borries because it took old estimates at face value and, moreover, it did not specify the method of calculation used to produce its estimates when data went missing in the 19<sup>th</sup> century literature.<sup>42</sup> Consequently, Borries provided his own calculations to estimate the value and volume of exports and imports of the German Empire in its borders of 1870 over the period 1836-1856.<sup>43</sup> To this end, he recalculated German trade by adding the total trade of all German states and subtracting trade between German states. The final result is a synthetic table of three-year averages exports and imports of all Germany.<sup>44</sup>

The seminal work of Hoffmann *et al.* did not aim at new estimates of the value of German foreign trade before 1871. Its main value-added over this period is the calculation of real series of imports and exports by categories of goods from 1836 onwards. They are estimated from a selection of quantity data taken from the *Statistische Übersichten* and import prices in 1880.<sup>45</sup>

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39. Borries (1970), 38–39; Hirth (1869), 110.

40. Bienengräber (1868); Hirth (1869), 115-130; Borries (1970), 40–41.

41. Bondi (1958), 145: 147–151.

42. Borries (1970), 5-6. "*Seine Zahlen sind unüberprüfbar und wissenschaftlich von sehr eingeschränktem Wert.*"

43. Borries (1970), 2-3. His aim is to reconstruct trade series for *Gesamtdeutschland* = Deutsches Reich of 1870 (excluding Alsace-Lorraine, including Bremen and Hamburg).

44. Borries (1970), 178.

45. Hoffmann *et al.* (1965), 530–544.

The latest estimate of German trade statistics is the one made by Lewis in an article that focuses on the reconstruction of series of world exports at current and constant prices over the period 1850-1913.<sup>46</sup> Noting that “German trade statistics for this period [1836-1888] cannot be used at all without some doctoring,”<sup>47</sup> he offered new estimates of German exports (total and manufacturing), at current prices from 1847 to 1888 and at constant prices over 1836-1888. Lewis relied on volume indices of Hoffmann, on import statistics of Germany's partners, and on prices of British exports to recalculate annual and homogeneous series of German exports within its borders in 1913.<sup>48</sup> He also revised the figures for the 1870s that are problematic according to him.<sup>49</sup> This last point needs some clarification, though. It is true that German trade statistics were still plagued with methodological problems during the 1872-79 transition period. In fact, except for taxed imports, there was no legal obligation to declare traded merchandises, and transit trade could be included in export or import trade in different proportions. The result was that exports tended to be undervalued rather than overvalued, as said by Lewis, and imports were overvalued.<sup>50</sup>

From all these estimates, one can try to reconstruct long-term series of German total trade at current and constant prices. Despite the overall quality of the work done by Borries, his series are generally ignored because of the limitation of the period and the absence of annual data.<sup>51</sup> Actually, the estimates of Borries differ little from those of Bondi that have the advantage of covering each year of the period 1834-1871.<sup>52</sup> In order to provide a comparison between the different evaluations, I have drawn a series of four graphs (see below). They compare Lewis export series at constant territory, current and constant values with Bondi and Hoffmann export series at current territory, current and constant values.

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46. Lewis (1981), 27-32.

47. Lewis (1981), 27.

48. It is a deduction because Lewis does not give an exact definition of the German territory.

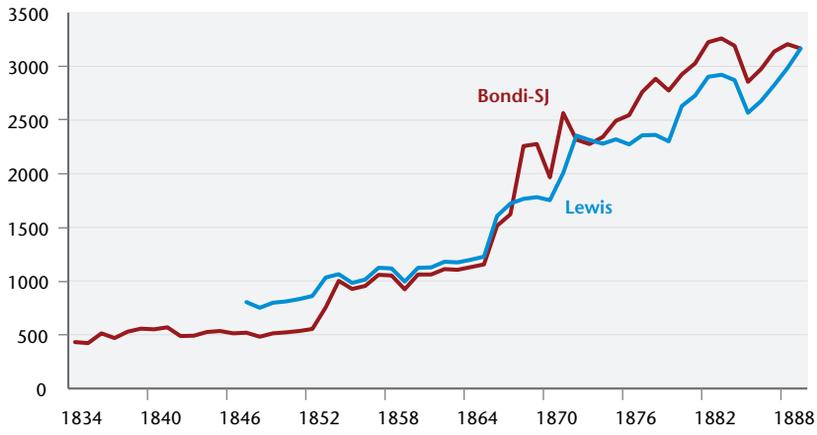
49. Lewis (1981), 27.

50. Statistik des Deutschen Reiches (1875), x.41-x.42; Zimmermann (1905), 305-309. The problem was solved with the *Reichsgesetz vom 20. Juli 1879*.

51. Dumke (1994), part two, 4, explains why he does not use Borries's estimates. Lewis (1981), 27, also points to the drawbacks of Borries's series: they cover only the 1836-56 period and contain no annual data.

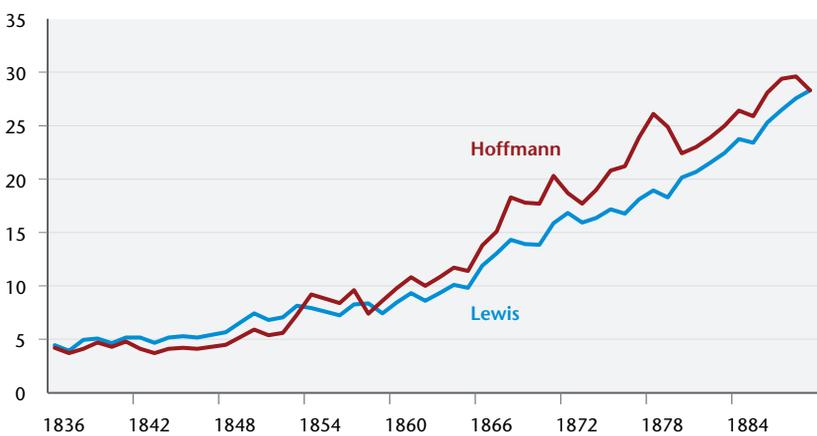
52. See the comparative table in Borries (1970), 91.

Figure 1. German exports, 1834-1889 (current values, million Marks)



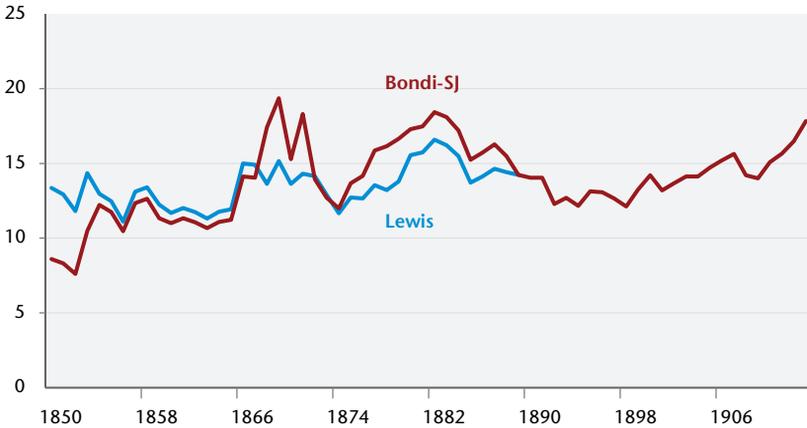
Sources: Bondi (1958), 145; Lewis (1981), 29-30; Statistisches Handbuch für das Deutsche Reich (1907), 9, 15.

Figure 2. German exports, 1836-1889 (volume indices, 1913=100)



Sources: Hoffmann et al. (1965), 530-32; Lewis (1981), 29-30..

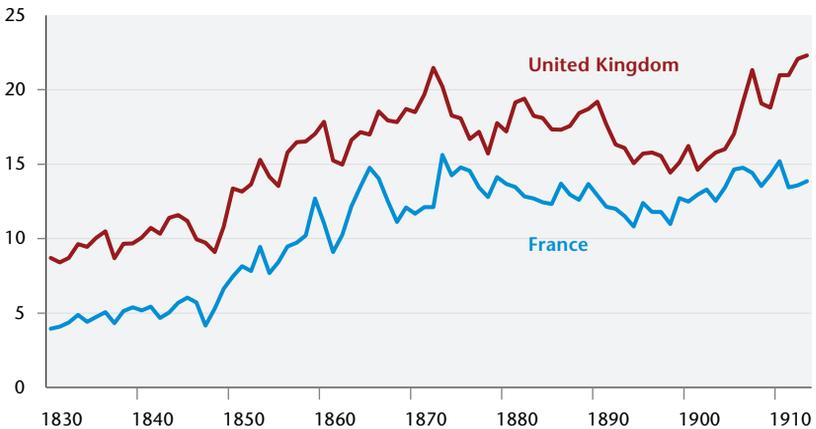
Figure 3. Germany's trade openness (X/PIB, current prices, in %), 1850-1913



Sources: Exports = Bondi (1958), 145; Hoffmann *et al.* (1965), 530-32; Lewis (1981), 29-30; *Statistisches Handbuch für das Deutsche Reich* (1907), 9, 15; *Statistisches Jahrbuch für das Deutsche Reich* (1938), 254.

PIB = Hoffmann *et al.* (1965), 825-828 (NNP zu Marktpreisen); Ritschl and Spoerer (1997), 51 (BSP).

Figure 4. France and United Kingdom trade openness (X/PIB, current prices, in %), 1850-1913



Sources: Asselain and Blancheton (2005), 86; Mitchell (2011), 451-53, 831-33.

The first two graphs show that Lewis's growth rates are roughly similar to those of Bondi and Hoffmann. There are however differences for years that see territorial enlargement of the Zollverein (1838, 1842, 1853-54, 1868, 1888-89) and over the period of transition (1870s). The third graph depicts estimations of Germany's nineteenth century trade integration. One could conclude that

Lewis's series should be preferred if one's purpose is to use a homogeneous series of trade. But, apart from the problem of the transition period, the third graph casts some doubt on Lewis data for his series indicates no increase in openness of the German economy between 1850 and 1889.<sup>53</sup> Is it credible that Germany (i.e. Zollverein in its 1889 borders) was as open in 1889 as in 1850? It looks strange that this industrializing and new economic union did not take part in the trade globalization process that unfolded in the third quarter of the nineteenth century, as is demonstrated by the cases of France and the United Kingdom (see graph 4). Besides, I have strong reservations vis-à-vis re-estimations at constant territory. If it is quite sensible from a retrospective point of view, it makes little sense from a historical point of view because analysis is carried on a fictional entity.<sup>54</sup> A better option seems to me to take into account an additional variable, the territorial changes, in the analysis of economic movements. Therefore, I would not recommend the use of Lewis series (remember that his work covers only exports). I do agree with what Lampe told me in a private exchange: "Bondi offers a series of estimates which have been criticized but without clear alternative series". The same can be said about Hoffmann's volume series.

#### 4. Conclusion

We still need global, detailed, annual, at current and constant prices time series of German trade statistics over 1834-1871. There is a wealth of information in the *Statistische Übersichten* that could be exploited in a new way. Now that the documents are being digitized by the *Bayerische Staatsbibliothek* the main problems remain the valuation of each good of the classification and the determination of partner countries. The estimations of Bondi, Hoffmann et al., and Lewis can certainly be improved. Lampe has paved the way in his paper by using prices quoted in Hamburg and Bremen complemented with British prices, Kaiserreich official prices for

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53. The rate goes from 13.4 % in 1850 to 14.2 % in 1889.

54. See, for example, Maddison's series that estimate German population over the long run. In Maddison (1995), 110, the population in 1913 is 37.8 million (Germany in 1989 borders); then in Maddison (2001), 195, German population jumps to 65 million (Germany in 1913 borders without Alsace-Lorraine). The current figure is 66.9 million (Statistisches Jahrbuch, 1952: Germany in 1913 borders including Alsace-Lorraine).

1872-73, Hübner's and Bienengräber's prices to convert quantity into value for two years.<sup>55</sup> He thus demonstrates that the many criticisms addressed to the trade statistics of the Zollverein should not be taken as an argument for not using them at all, although it certainly means that they should be used with caution. However, reconstructing German bilateral trade flows before 1871 seems very problematic since German documents provide unusable information.<sup>56</sup> Using trade statistics of German states partners, as was attempted by Kutz for the years around 1830, can be a second-best solution.

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