

Stationers, *Papetiers* and the Supply Networks of a Swiss Publisher: The Société Typographique de Neuchâtel and the Paper Trade 1769-1789¹

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What can be learned about the paper trade from digital and archival sources on the business of a single publishing house? Would the lessons it teaches be of merely local interest, or can such a case study reveal wider information about the, rhythms, networks and scale of the trade? These are questions we seek to address in this study. In the process we hope to shed fresh light on the practices, materials, and networks of the early modern paper trade in Europe, particularly the mechanisms by which printers and publishers attempted to ensure a regular supply of paper to their workshops. By analyzing the supply and demand for paper from a single company's business records across a time span of almost two decades, our study illuminates the business practices of paper traders, and the interplay of supply networks and purchasing strategies of major paper buyers in early modern Europe.

This chapter grew from of a desire to explore the rich data on professional groups in the award-winning French Book Trade in Enlightenment Europe (FBTEE) database, which documents the trade of a large Swiss publisher-wholesaler, the Société typographique de Neuchâtel (STN).² The *papetiers* (papermakers and paper merchants) in the database were the ideal case study. Not only did they supply the most important and costly raw material for

¹ This chapter was supported by the Australian Research Council Discovery Projects funding scheme (Project number DP160103488) 'Mapping Print, Charting Enlightenment' and used research conducted in the FBTEE database created in the course of the British Arts and Humanities Research Council's Research Grants (Standard) Scheme AH/E509363/1, 'The French Book Trade in Enlightenment Europe'.

² Simon Burrows etc., *The French Book Trade in Enlightenment Europe Project, 1769-1794*, <http://fbtee.uws.edu.au/stn/>. The FBTEE database is at <http://fbtee.uws.edu.au/stn/interface/>. Last consulted 31 March 2020.

the books the STN published, but, through the database, we could also trace the outward flow of the paper as a finished product. No other professional group in the database offered this advantage.

Furthermore, this was an opportunity to contribute to a largely unexplored area. Although paper manufacturing has been studied in some detail, little systematic attention has been paid to the paper trade prior to the current volume.³ This is perhaps surprising, given the significance of paper to master narratives of the period under consideration. Paper was, after all, an essential raw ingredient to the revolutionizing of the knowledge industry, the emergence of a largely print-based public sphere, and to the bureaucratisation and extension of administrative government based on mass communication and scientific and statistical approaches to the management of national resources. Further, the production and movement of paper was an early example of a mass production industry, although still based on largely artisanal skills. Europe's demand for paper by the late eighteenth-century was colossal. Existing estimates suggest France alone needed an annual supply of 300,000,000 to 700,000,000 sheets to keep the wheels of commerce, government and publishing rolling, and across the eighteenth century demand was growing.⁴

How and where to access paper was thus a significant issue for a publisher such as the STN, whose annual demand for printing paper at its peak equated, as we show below, to perhaps 1% of French national demand, and a significantly higher proportion of the demand from the Swiss states. Maintaining access and ensuring the flow of paper supplies, in appropriate

³ Burrows etc., *The French Book Trade in Enlightenment Europe Project, 1769-1794*.

⁴ On the scale of the industry, see Warren J. Scoville, 'Government Regulation and Growth in the the French Paper Industry during the Eighteenth Century', *American Economic Review* 57:2, (1967), pp. 283-93. Cf. The figures given for the sixteenth century by Lucien Febvre, Jean-Henri Martin, *The Coming of the Book. The Impact of Printing 1450-1800* (London: Verso, 1984), p.40, which, as suggested below, n. 46, seem to over-estimate output at that period.

quantities and qualities, and – since paper was the biggest cost in book production – at a reasonable price, through cycles of fluctuating demand, was a significant logistical challenge.

The STN is notable both for its historiographical interest, since it has spawned a large literature, and because it was an ambitiously large operation, printing some 233 editions across its history. At its height in 1777, the STN employed a dozen presses, equalling the largest Parisian publishing houses of the day.⁵ It has also left a uniquely rich and accessible archive. This paper draws on both that archive and data about books and papermakers in the FBTEE database. We wish to explore two main questions. First, how (and why) did the STN's demand for paper change over time? Second, how did it develop its supply networks and strategies in response to its publishing and business challenges?

1. Sources of Evidence

There are three main sources of evidence for studying the STN's paper consumption. First, there is the direct evidence of the STN's paper use from accounting documents in the STN archive which record paper stocks or use. Unfortunately, detailed records of the STN's paper purchases exist only for three isolated periods of about three years each. Further summary information is scattered across the Société's day books, which survive piecemeal, where they are intermingled with sales and purchase records for books, other stationery supplies, candles, transportation and all the other expenses necessary to support a large and complex publishing house. Due to the difficulty of assembling this fragmentary and scattered evidence, which needs to be gathered *in situ* in the Bibliothèque publique et universitaire de Neuchâtel, where the STN archives are housed, we have adopted an approach based on the second and third

⁵ See Bibliothèque nationale de France [BnF], MS Fr. 22,081 fos 343-348, 'Visites des Inspecteurs de la Librairie, Mai 1770'. Of the 39 authorized Parisian printers, only three had more presses than the STN's dozen: Delatour had fourteen and Le Breton and Le Prieur had thirteen each. Five other printers had eleven presses and two more had ten each.

classes of available evidence. Hopefully future research in the STN archives will add colour, nuance and significant detail to the preliminary picture we offer here.⁶

The second class of evidence, the STN's correspondence with its paper suppliers, is more helpful, though the record is incomplete, and the data quality uneven. The STN preserved all incoming correspondence in client dossiers and its clerks maintained large, indexed out-letter-books as well. For this study, we have chosen to consult the STN's outgoing correspondence, which tends to focus on a single issue per letter, and is readily available via Robert Darnton's website.⁷ The in-correspondence, by contrast, can only be consulted *in situ* in Switzerland. Unfortunately, the letter books only survive for certain periods – as **Figure 12.1** indicates. In contrast, the in-letter record appears more or less complete from 1769 to 1788, when it dries up, perhaps due to a change in the company's ownership.⁸ Fortunately, the FBTEE database contains the first and last dates of each client's extant incoming correspondence. This information has been used to reconstruct the evolving cultural geography of the STN's paper supply network.

⁶ The sole piece of evidence gathered direct from these sources is the reference to the STN's first ever paper purchase from Charmet below. An image of the accounting record for the purchase is reproduced in Michel Schlup (ed.), *L'Édition neuchâteloise au siècle des Lumières. La Société typographique de Neuchâtel (1769-1789)* (Neuchâtel: Bibliothèque publique et universitaire de Neuchâtel, 2002), p. 9, from where we took this information.

⁷ Bibliothèque publique et universitaire de Neuchâtel (BPUN), MS 1000-1238, Archives de la STN; <http://robertdarnton.org/literarytour/copiesdelettres> last consulted March 2020.

⁸ Mark Curran, *The French Book Trade in Enlightenment Europe I. Selling Enlightenment* (London: Bloomsbury, 2018), pp. 153-154, examines evidence that in the late 1780s the STN was acquired by a rival Neuchâtel bookseller, Louis Fauche-Borel.

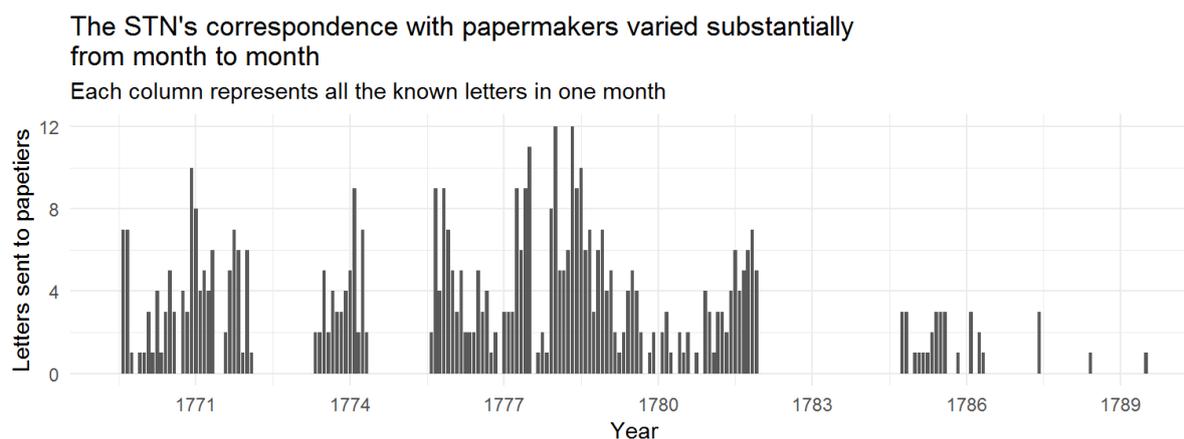


Figure 12.1

Figure 12.1 shows all outgoing correspondence to *papetiers* in the letter books. We were able to identify these particular letters using FBTEE's biographical data, which catalogues the surviving in- and out-letters of every STN correspondent, including their geographic base, number of letters – and most importantly, their profession. The database also offers ancillary data about the STN's correspondents, such as their gender or whether they were sole traders or part of a business partnership. Out-letters have also been sampled to explore how much paper the STN was ordering from whom, what types and quality of paper individual clients provided, and what kinds of relationships the STN fostered with their suppliers. The letters also sometimes allow us to sub-divide our *papetiers* into 'millers' and 'merchants', enabling us to further interrogate how the STN built its networks among different sorts of suppliers.

Third, there is the data available in the FBTEE database, which provides both the richest and the least direct evidence. The database contains comprehensive (though not perfectly complete) records of the STN's print-runs and sales gleaned from the STN's accounting ledgers.⁹ It also offers biographical and geographical data about the STN's 'clients',

⁹ A full list of archival sources used to construct the database is available at: <http://fbtee.uws.edu.au/stn/interface/mslist.php> last consulted 31 March 2020.

including *papetiers*, drawn mostly from archival guides.¹⁰ Finally, it has assembled bibliographic data about the books the STN published, including in most cases their pagination and format.¹¹ Using these sources, together with computational analysis to help fill any gaps in the record, we can reconstruct from where the STN was sourcing its paper and derive close estimates of how many sheets of paper they required to complete print runs for all known STN editions. This has been an imperfect and multi-stage process. To arrive at the most consistent, accurate and comprehensive figures, data on stocktakes and sales was used to supplement incomplete information on print-runs for STN editions, and the resultant recovered or inferred data was cross-referenced with bibliographic evidence concerning pagination and format. Finally, we consulted secondary work for information about the STN's paper purchases for printing parts of the third edition of the *Encyclopédie*, since this was not accounted for in the regular accounts. Through this process, we have been able to estimate the STN's annual paper needs between 1770 and 1794. Although there is a paucity of reliable data after 1788, this is not a significant drawback because by then the STN was in terminal decline and had largely retreated from publishing. The next section explains our process.

In sum, the STN provides a good case study for the eighteenth-century paper trade, because of the variety of evidence available. We know who they were ordering paper from, where those *papetiers* were based, what sort of relationships they fostered with their suppliers, and how much paper they were using each year to print what sorts of books. The STN itself has

¹⁰ See Bibliothèque publique et universitaire de Neuchâtel (BPUN), MS 1000A, 'Société typographique Correspondants: Répertoire géographique', typescript handlist prepared by John Jeanprêtre, available at http://bpun.unine.ch/pdf/BPUN_typo_correspondants_repertoire_geo.pdf on 31 March 2020, and the BPUN's card index of correspondents, which offers supplementary information.

¹¹ The base source for our bibliographic work on STN editions was Michael Schmidt, 'Liste des impressions et éditions de la société typographique de Neuchâtel', in Schlup (ed.), *L'Édition neuchâteloise*, pp. 233-285. The FBTEE project identified several further editions and reimpressions.

already been the subject of considerable scholarly work, allowing us to explain and contextualise these findings.¹²

2. Estimating the STN's paper usage

2.1. Printing Paper

The STN was a large publishing house, and printing paper was the main kind of paper it consumed. To estimate the STN's use of printing paper, we first estimated how many sheets were required to manufacture one copy of each book they published. This figure was then multiplied by our best estimate of each book's print run. We began by isolating the 233 editions printed by the STN, from the approximately 3,900 editions relating to the STN in FBTEE (which includes books they did not publish themselves but merely bought or sold).¹³ Somewhat confusingly, the STN published 246 separate titles under their own name or known false imprints, plus five volumes of the first quarto edition of the *Encyclopédie*. Although comprising only a small fraction of its catalogue, the editions the STN printed nevertheless accounted for two-thirds of STN sales and a yet greater portion of its revenues. For 187 of these editions we had pagination and standardised format data to calculate the number of standard 'sheets' of printing paper used in production of every volume. Figure 12.2 explains the relationship between book format and paper usage for the STN's four main publishing formats. One standard-sized folio 'sheet' would be folded one to six times to

¹² In addition to the volumes by Burrows, Curran, Darnton and Schlup cited elsewhere in these notes, see also Robert Darnton, Michel Schlup (eds.), *Le Rayonnement d'une maison d'édition dans l'Europe des Lumières. La Société typographique de Neuchâtel 1769-1789* (Neuchâtel: Bibliothèque publique et universitaire Neuchâtel, Hauterive : Editions Gilles Attinger, 2005), a wide-ranging volume of essays based on a conference held in 2002.

¹³ STN works for this purpose included commercial editions, commissioned works, and co-published *livres en société* and international editions. In total the FBTEE database traces 3,987 editions of 3,601 works. However, some editions are catch-all pseudo-editions sharing common known features and eluding precise identification. Due to the messiness of the data, there may be occasional undetected duplication of editions and works.

produce a different number of pages. One sheet corresponded to 4 pages in-folio, 8 pages in-quarto, 16 pages in-octavo or 24 pages in duodecimo. In the database, the book format is recorded as a whole number giving the number of leaves (e.g. quarto = 4). Therefore, for these 187 editions, we could apply the following formula to calculate the number of sheets required to print one copy of each book:

$$s/heets = \lceil \frac{pages}{2 \times leaves} \rceil$$

As the 'ceiling' symbols ($\lceil \dots \rceil$) indicate, the result was rounded up to the nearest whole number. This is because the pagination data, gleaned largely from library MARC records, sometimes fails to record blank pages, which arise where not all of a folded sheet has been printed.

Figure 12.2. How the STN folded a standard sheet

Format	Folds per sheet	Leaves per sheet	Pages per sheet
Folio	1	2	4
Quarto	2	4	8
Octavo	3	8	16
Duodecimo	6	12	24

Multivolume works offered a slight challenge to this methodology, since each volume of such a work might require a different number of sheets to fabricate, but this information was not always disaggregated for individual volumes in the database. Thus for multivolume works, we used the average number of sheets per volume. Since each volume was usually produced and sold in roughly equal numbers, this was a tolerable adjustment to make. Our one exception was the *Description des arts et Métiers* (1771-81), for which we separately

calculated the sheets required for each volume. In this case accuracy was important because it was a uniquely large edition that consumed an enormous amount of paper.

For fifteen further titles, we could determine the number of sheets required from documentary evidence, even though we lacked data on format and / or pagination. This is because eighteenth-century publishers, starved of liquidity, routinely swapped books in the form of printed sheets in order to build a varied stock-list. The STN recorded many such transactions in their ledger, thus allowing us to say how many sheets a book comprised.

This leaves 44 further books where our data is insufficient to calculate the number of sheets required per volume (**Figure 12.3**):

Figure 12.3. Format of the 44 books which have no available pagination or sheets data

Format	Number of editions
Folio (in-2)	1
Quarto (in-4)	3
Octavo (in-8)	10
Duodecimo (in- 12)	7
Not known	23

The best we could do for these works was to make an educated guess. Fortunately, we knew in each instance how many volumes each edition comprised, so all that remained was to estimate how many sheets were needed per volume. For 21 of these books, we also knew the book format. Our first technique was to examine the mean number of sheets per volume by book format (**Figure 12.4**). This revealed two different patterns. Roughly speaking, the

distribution for octavo and duodecimo volumes was 'normal', with the number of sheets per volume clustering around the mean, and the median and mean being quite close together. It is true that the octavo distribution was 'bimodal', with two peaks to the bell curve rather than one, but these peaks were about equal in size, so the median or the mean were still a good indicator of the data's central tendency. Given this distribution, we felt justified in assuming that each of the seventeen unknown octavo or duodecimo volumes used the median number of sheets for that format (which proved to be sixteen sheets in both cases). We opted for the median over the mean, since it provided the most likely *whole number* for each edition, and generally speaking books were fabricated out of whole sheets.

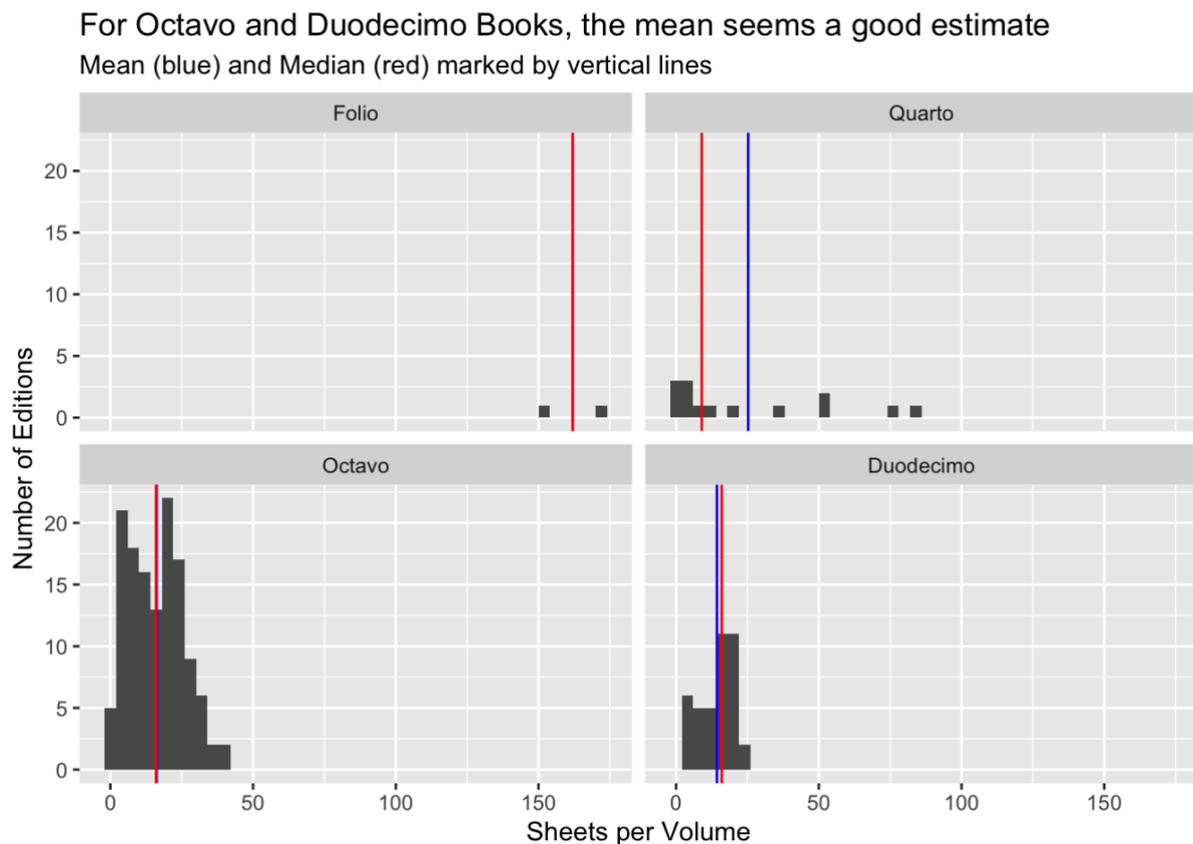


Figure 12.4

Quarto and folio books presented a problem, however. The quarto books varied considerably in size, while there were only two folio volumes from which to extrapolate, making any

estimate hazardous. In the end, we decided again to use the median sheets per volume in both instances as our best guess, though this introduces significant uncertainty into our data.

The remaining 23 titles were even more problematic. Our best bet was to assume that they follow the same distribution as the data as a whole. As **Figure 12.5** shows, this did present an even graver problem. When we consider all the books in the database together, the sheets per volume cluster around the mean of 17.6 and the median of 16. But the data skews right, representing the small number of quarto and folio volumes that can have many dozens of sheets per volume. The risk was that a book might come from this long tail, and therefore require up to five times as many sheets as our estimate. With some reservations, therefore, we opted to assume these books used the median number of sheets as well. **Figure 12.6** summarises the assumed medians for our estimates, showing also the means for comparison.

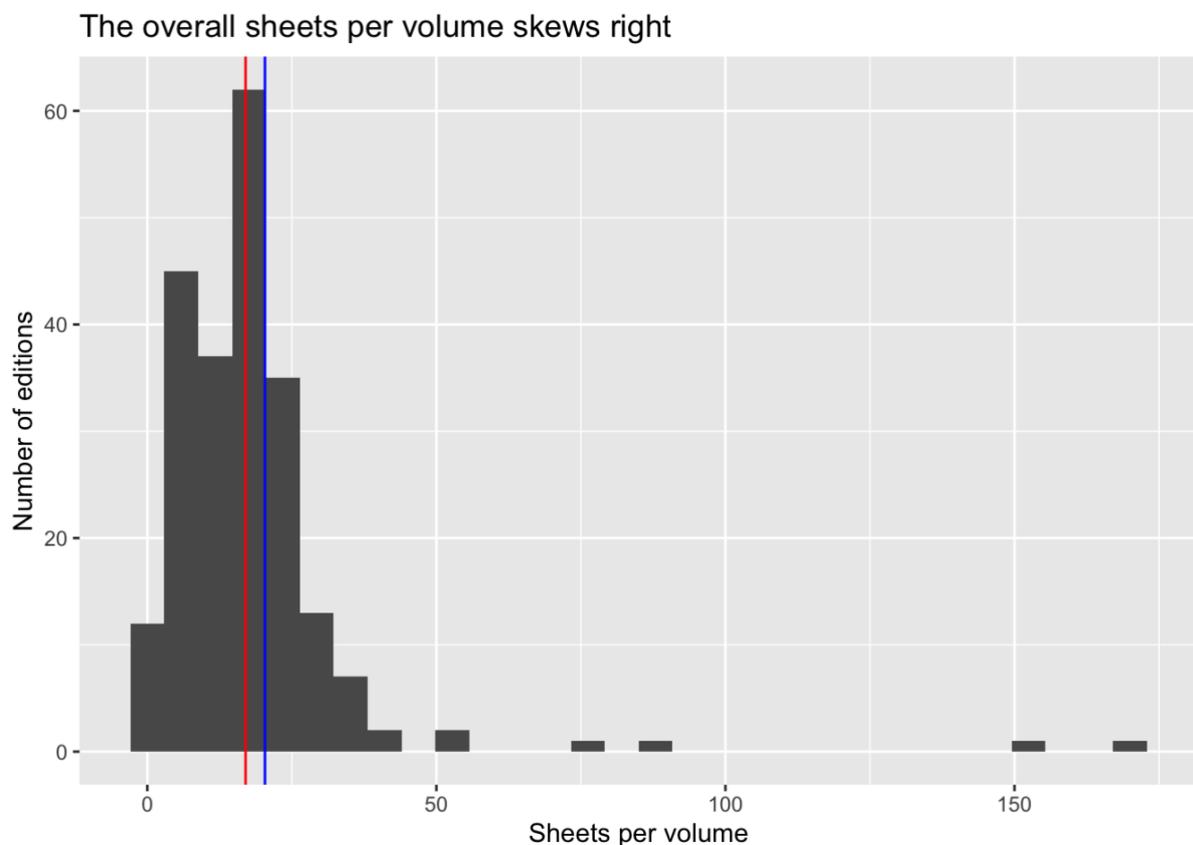


Figure 12.5

Figure 12.6. Median and mean sheets per volume by format (*rounded up to nearest integer, due to division by volume)

Format	Median	Mean
Folio (in-2)	162	162
Quarto (in-4)	7	20.6
Octavo (in-8)	16	16.2
Duodecimo (in-12)	16	14.3
Not known	16*	16.6

Having estimated the number of sheets required by volume, we multiplied each book's sheet value by the number of volumes known to be printed. For 82 of the STN's books, we know the print-runs from the STN's records. For a further 102, the database contains an 'assumed' print run based on the available sales data and stocktake data, and there are thirteen cases where we have a mixture of known and 'assumed' print-runs. For the remaining 49 editions we revisited the available data to derive a new best estimate for the print run based on sales, stocktakes, and print runs of similar titles in the database. This analysis revealed that fourteen books sold as STN editions were actually printed elsewhere, bringing the total number of books printed down to 232 (plus five volumes of the *Encyclopédie*, which we will consider in a moment). For the 82 recorded print runs, we also had precise date when the printing was recorded in the ledger, presumably the date that printing was completed. For the estimated print runs, we identified the year that an entire edition or single volume was printed, based on

the first known transaction involving (or appearing to involve) that book in the database.¹⁴ As the STN's main unit of accounting was the volume, rather than the whole book, we multiplied the total volumes printed by the average sheets required per volume for each book to calculate the sheets required.¹⁵

This data was combined with additional figures in Robert Darnton's *The Business of Enlightenment* concerning the paper required for manufacturing the third edition of the *Encyclopédie*, five volumes of which were printed by the STN as part of a wider consortium. Because it sold by subscription, the *Encyclopédie*'s sales were not recorded in the STN's regular accounts and thus do not appear in the FBTEE database. This brings the total number of books printed by the STN up to 233. Fortunately, Darnton gives print run data and monthly totals of how many reams of paper were provided by each of the STN's suppliers.¹⁶ Although the STN only produced volumes 6, 15, 19, 24 and 35 of the *Encyclopédie*, the length of each volume (typically over 1,000 pages), massive print-run (for 8,525 subscribers), and the large quarto format meant it required huge quantities of high-quality paper. Darnton calculated that the entire enterprise required 36 million sheets – enough to cause nationwide shortages and price inflation. The STN's volumes consumed about 8% of this total. In 1778, at the height of production, it bought in 2,208,250 sheets for printing the *Encyclopédie*, which amounted to over 84% of its annual needs (**Figure 12.7**).¹⁷

¹⁴ Sometimes the approximate date of printing was visible from a sudden flurry of 'sales' of large numbers of copies of a work which had previously recorded low stocks and / or sales volumes. Usually the STN would dispatch several large consignments of pre-ordered copies within a day or two of completing a print-run.

¹⁵ The transaction data actually gives the number_of_volumes, not the number of copies printed or sold. So a sale of 300 volumes of a 3-volume work would correspond to a sale of 100 copies of that edition.

¹⁶ Robert Darnton, *The Business of Enlightenment. A Publishing History of the Encyclopédie* (Cambridge, MA: Belknap Press of Harvard University Press, 1979), pp. 37, 178, 190-191.

¹⁷ *Ibid.*, pp. 190-191.

Figure 12.7. Total sheets required for the STN's printing operations by year, as per our calculations¹⁸

Year	Sheets Printed
1769	6,000
1770	431,935
1771	686,757
1772	542,027
1773	1,281,339
1774	755,971
1775	637,519
1776	569,288
1777	1,587,203
1778	2,438,519
1779	2,473,387
1780	831,253
1781	1,152,654
1782	2,393,858
1783	1,299,257
1784	267,122
1785	219,081
1786	48,596
1787	200,516

¹⁸ The figures have been rounded to the nearest whole number. Although the STN traded until 1794, its last known editions date from 1790.

1788	40,580
1789	12,250
1790	2,100

This method had some known imprecisions at the margins. Analysis of stocktake and sales data indicates that a few ‘sales’ were missing from even the most complete accounts. Further, for a few brief periods we had substantial gaps due to reliance on inferior sources, such as ‘*livres de commissions*’, which only recorded sales of books sold by mail order to clients in the book trade. For a couple of periods, notably June 1787 to May 1790, there is almost no data. Fortunately, since we only had to look at sales and stocktakes either side of an inferred printing, these considerations affected calculations for only a few editions. In a handful of cases, we lacked a closing stock-take, and these were more problematic, since then we could only rely on known sales, which were in a couple of cases suspiciously small. In addition, copies of a few editions printed late in the STN’s history were undoubtedly among the stock which remained unsold when the company was wound up in 1794. These appear nowhere in the accounts. Copies discarded as defective on printing are also missing.

Equally inconsistencies and incompleteness in pagination records meant that some pages may remain unrecorded.¹⁹ Some ‘derived’ printings also defy precise dating: the best we could do

¹⁹ This calculation may not be wholly accurate for all the editions, because some were in multiple volumes and the pages may be concatenated by our approach, and blank pages and illustrations are inconsistently recorded in

was locate them between two events, generally stocktakes or a flurry of sales exceeding stock figures implied by the preceding stocktake and sales data. Thus our figures are not so much definitive as a 'fuzzy snapshot' of reality. Nevertheless, this snapshot allows us to discern patterns otherwise invisible and to explore the STN's trade in its entirety. Our figures more likely under- than over-estimate the STN's paper needs; but for the larger editions that consumed the bulk of the STN's printing paper, our data is significantly more reliable.²⁰

2.2. Stationary and high-quality paper

Printing paper for books was not the only paper required to run a publishing house. The STN also needed writing paper for around 25-30,000 business letters, high quality *chancellerie* paper (sometimes in pre-bound form) for use in accounting documents, and further paper for use in job-printings of trade cards, hand-bills, and jobs undertaken for the local churches or the government of Neuchâtel.

Although the STN's consumption of writing and *chancellerie* paper fades into insignificance in comparison with their use of printing papers, it does provide some insights into the volume of paper required to support a major international manufacturing enterprise at this period.

bibliographic data. The multi-volume books in question comprise dozens or even hundreds of sheets, so this difference (of maybe one or two sheets per copy) is of little statistical significance. See also note 26 below.

²⁰ A sampling of five high-selling volumes for which the database held hyperlinks to the google-books copies showed that the STN database under-reported by just four pages across a total of 1,428 pages, an error margin of just 0.28 per cent. The volumes in question were *Inceste avoué* (228 pp.) (under-reported by 4 pages), *Planta gagnant sa vie en honnête homme*, 1st edition (74 pp.), (2 pages under); *Destruction de la Ligue* (258 pp.), (2 pages over-reported); and *De La Vérité* (372 pp.) and *La Thévenon* (496 pp.), (both reported accidentally). Over-reporting can occur when bibliographers report marbled flyleaves which were added on binding. Google books were preferred for this purpose because unlike most digitized copies, covers and all front matter are habitually included.

These papers were produced in different sizes and qualities to printing paper, depending on their purpose, and were sometimes acquired in bound form. A case in point is the large ledger known as '*Brouillard A*', bought by the STN in 1769, which contains accounts for the STN's very first business transactions. Its first page reveals the centrality of paper of all sorts to running a publishing house. Having opened with a customary handwritten benediction 'Au nom de Dieu. Amen', it records – on fine *chancellerie* paper – the starting capital advanced by each partner, the acquisition of a press and characters, the purchase of the STN's first printing paper – 24 reams of 'papier dit bâtard' from M. Charmet on 25 July 1769 – and the publisher's first expenditure on postage for letters (though not the writing paper on which they were written or the account book itself).²¹

The STN's out-letter books record several purchases of *chancellerie* and writing paper from the *papetier* Jérôme Blum, a major supplier for high quality paper, both for writing and for printing illustrative plates for books. For example, on 7 January 1777, having received some samples, the STN ordered Blum's entire stock of four reams of paper for printing 'planches' (plates) and asked him to send six more as soon as possible.²² Three months later they requested six reams of '*papier de poste*', which was to be of similar to that on which they sent their order, as well as six reams of '*papier de chancellerie*' and a ream of 'papier bleu'.²³ In October 1779 they asked Blum for twelve more reams of *chancellerie* paper, and the following February 1780 twelve reams of '*papier de poste*'. They ordered six more reams of

²¹ BPUN, MS 1033, Brouillard A, fo. 2 [?], reproduced in Schlup, *L'Édition neuchâteloise*, p. 9.

²² BPUN, MS 1105, Copies des Lettres G2, p. 1237, STN to Blum, 7 January 1779.

²³ Ibid., p. 1421, STN to Blum, 8 April 1779.

writing paper in September.²⁴ These orders alone amounted to 26,500 sheets of quality paper across a three-year period, of which only 5,000 were for use in printing.

This suggests that the STN was using non-printing papers for more than its official business correspondence and accounting and auditing purposes. We know, for example, from the surviving out-letter books that their total business correspondence across their 25-year existence was around 25,000-30,000 letters, roughly matching the 25,000 surviving in-letters in the archive. This equates to around 1,000 out-letters per year, or three per day. To judge from the copies in the STN's surviving letter books, most letters would probably have fitted on a single sheet of writing paper. Customarily that sheet would also have been folded, sealed and addressed, rather than being placed in an envelope. Yet from Blum alone they ordered 12,000 sheets of letter writing paper in just three years, suggesting their total consumption may have exceeded 100,000 sheets across the STN's history (though it should be noted that 1777-1780 was the high point of the business).

Similarly with *chancellerie* paper, the STN's demand appears to be significantly higher than we might expect. Their orders for 9,000 sheets of *chancellerie* from Blum were probably sufficient to supply all the accounting records they ever needed. So what was the rest for? Perhaps it was for internal use, or perhaps the STN were trading it on their own account? A more likely explanation, however, is that the *chancellerie* paper was being used to produce pre-printed forms and ledgers for the local administration and businesses, while the writing paper could have been used to produce standard form letters.²⁵

²⁴ BPUN, MS 1108, Copies des Lettres H, pp. 261, 551, 916, letters of STN to Blum, dated 5 October 1779, 26 February 1780, 16 September 1780.

²⁵ For an example of such a form letter from the STN archives, see the filled out 'lettre de voiture' dated 'Morat, ce 12 9bre [i.e. novembre] 1779' and signed by Haberstock in Schlup (ed.), *L'Édition neuchâteloise*, p. 198. In

3. Demand for paper in Francophone Europe

3.1. Fluctuating demand: volatility and the rhythm of the trade

Our estimates establish that a publisher's demand for paper could be extremely volatile. As **Figure 12.8** shows, the STN's printing paper needs fluctuated wildly: their usage could rise by 300% or drop by 80% in a single year. The STN's demand for paper spiked in 1771, 1773, 1778-9 and 1782. More intriguingly, their demand for printing paper collapsed in 1783-84. These fluctuations reflect two key facts: first, overall demand was driven by a very small number of costly paper-intensive editions; second, to maintain liquidity it was imperative to offload printed books quickly. It was a combination of these two factors that eventually drove the STN over the edge, as they over-invested in certain prestige editions, and were suddenly exposed to a more hostile regulatory environment. If the STN was typical, the paper trade in late eighteenth-century Europe was a highly volatile business.

contrast, letterhead paper seems to be a slightly later innovation, emerging on the official correspondence in the French revolutionary period.

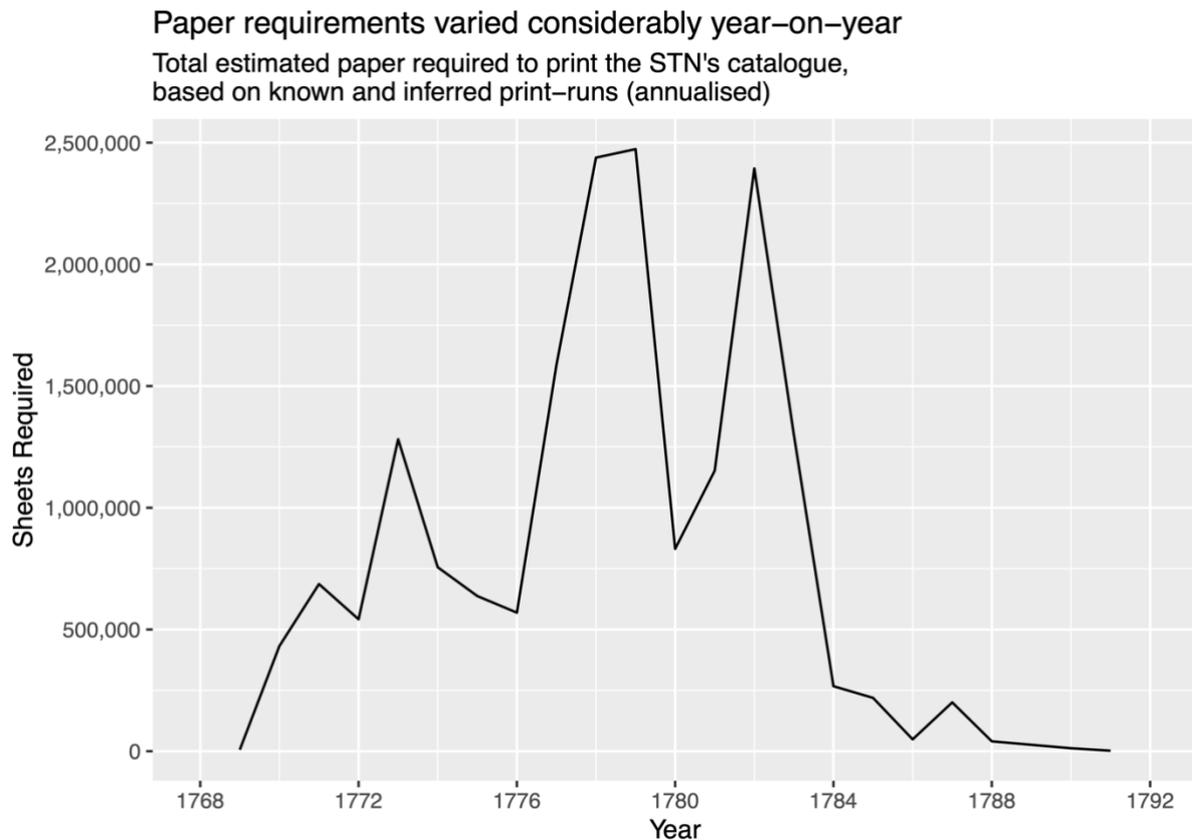


Figure 12.8

Although we already know that the spike of 1778-1779 was primarily caused by the paper requirements of the *Encyclopédie*, the causes of the subsequent spike in 1782 and collapse of 1783-4 require further explanation. **Figure 12.9** lists the ten most paper-intensive editions the STN produced in 1782, a year in which they published major editions of their four all-time bestsellers, several of which needed significant amounts of paper. Among them, their four volume edition of Louis-Sébastien Mercier's *Tableau de Paris* edition of 1782 alone required over 800,000 folio sheets.²⁶ This was one-third of the paper required by the STN that year. Another edition of the same work, in two volumes, for which we lack pagination details,

²⁶ There are some confusions around the edition history of this work, so the precise number is uncertain. However, although the STN accounts suggest that there were 4 and 8 volume editions, it appears that this was just a matter of binding (2 vols were often bound together), so in paper terms they were probably the same thing.

required perhaps 180,000 more. An earlier peak in the STN's demand for paper in 1771 was also driven by a single work – Voltaire's nine-volume *Questions sur l'Encyclopédie*.

Figure 12.9. The STN's 10 largest print-runs of 1782

Book	Volumes	Sheets
<i>Tableau de Paris</i> (edition in 4 vols.)	36,700	798,225
<i>Collection complète des oeuvres de Madame Riccoboni</i>	9,000	183,000
<i>Tableau de Paris</i> (edition in 2 vols)	6,900	179,400
<i>Destruction (la) de la ligue, ou le réduction de Paris</i>	10,200	173,400
<i>Confessions (les) de J. -J. Rousseau; suivies des Rêveries du promeneur solitaire</i>	4,102	137,417
<i>Pièces importantes à la dernière revolution de Genève</i>	7,900	126,400
<i>Amusemens de société, ou Proverbes dramatiques</i>	6,000	107,000
<i>Contrat conjugal, ou Loix du mariage</i>	4,166	87,486
<i>Inceste avoué à un mari,</i>	4,762	76,192
<i>Correspondance ou défense fondamentale de spectable Théodore Rilliet contre l'ordonnance du conseil de Genève</i>	3,061	67,342

The stunning collapse of the STN's paper supply network from 1783-4, as measured by number of active correspondents, reflects a wider crisis for the STN and Swiss publishing. On 12 June 1783, the French government decreed that all books entering the kingdom must travel to Paris to be inspected, rather than to the *Chambre syndicale* [i.e. booksellers' guild hall] nearest to their port of entry. This measure, ostensibly aimed against the clandestine trade, hit the Swiss harder than their Dutch, Belgian and Rhenish competitors, because both

they and their markets were more distant from Paris. The Swiss hence faced greater added costs and longer delays in getting fresh wares to their customers. Over-extended after their rapid expansion, the STN were heavily exposed, particularly when hit simultaneously by a French financial crisis and Europe wide credit squeeze. By June 1784 the STN's directors, who depended on the French market and credit arrangements, were obliged to cede control of the company to eleven new partners, who paid 290,400 *livres* in hope of liquidating the STN's mountain of unsold stock.²⁷ By 1782 this had amounted to 1.9 million sheets.²⁸ Thereafter, the company shifted its attention towards other European markets. It redoubled efforts to offload unsold stock, and gradually retreated from publishing. Although it continued trading until 1794, the STN printed their last books in 1790 (**Figure 12.7**).²⁹

The STN's market exposure risk was accentuated by the capital sunk into a few key works. In fact, nearly all the STN's demand for paper can be accounted for by a few large editions.

Figure 12.10, which shows the total sheets required to print the entire run of each STN edition, reveals that the paper needs of the STN's editions follow an exponential or 'power law' distribution. Just two editions required more than two million sheets apiece, one more needed over one million, and three further editions required between 500,000 and 1,000,000 sheets to produce. **Figure 12.11** gives another view of the data, showing how much paper was consumed by the top one, top five, top ten, top 20, top 50 and all editions combined. More than half the STN's printing paper (58%) was used to produce just their ten largest editions (**Figure 12.12**). And even this top ten were dominated by just two works: the

²⁷ Curran, *The French Book Trade I*, p. 110.

²⁸ *Ibid.*, p. 98.

²⁹ Schmidt, 'Liste des impressions', p. 283.

Encyclopédie and the *Descriptions des Arts et Métiers*, which together consumed around 5,464,220 sheets.

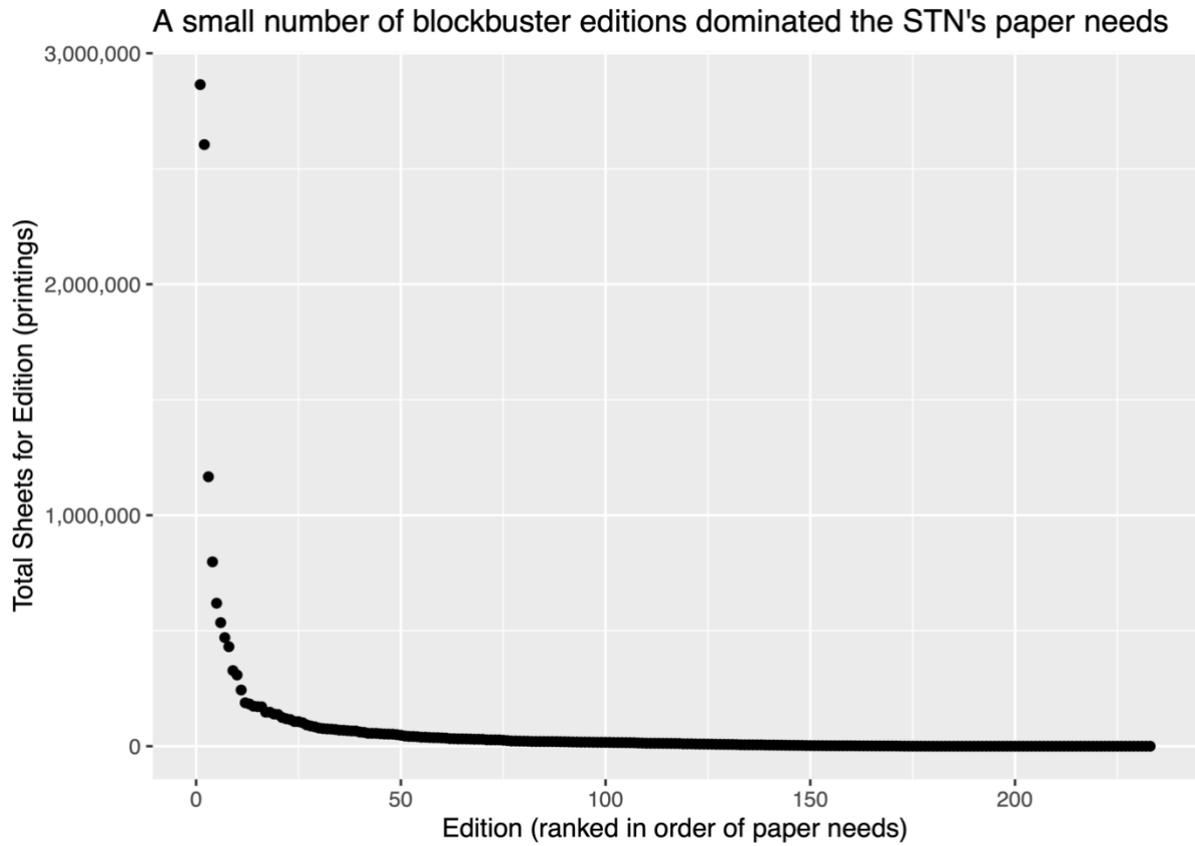


Figure 12.10

Figure 12.11. How a Small Number of Editions Drove the STN's Demand for Printing

Paper

Top n	Proportion	Sheets
1	16%	2,864,250
5	45%	8,048,045
10	58%	10,214,629
20	69%	12,305,507
50	84%	14,926,145
233	100%	17,713,026

Like the *Encyclopédie*, the *Descriptions des Arts et Métiers* was a lavishly illustrated *édition de luxe*. Although sold largely by subscription, it proved a splendid 'white elephant'. An unauthorised and significantly expanded version of the Parisian original, the Neuchâtelois edition was published between 1771 and 1783 and ran to 19 volumes. Surviving evidence suggests that having run off 2,500 copies of the first volume, the STN cut back production to around 1,500 copies for subsequent volumes. These figures suggest that between 1771 and 1785 the *Descriptions des Arts and Métiers* alone absorbed almost 2.6 million sheets. Yet a significant proportion of these sheets soon stacked up unsold – or undelivered – until, on 18 August 1785, the STN off-loaded some 9,550 unsold volumes to the Parisian bookseller Moutard, the holder of the French *privilège* for the work. The delivery included still to be completed copies of an unfinished twentieth volume 'plus le manuscrit de [sheet] N et les épreuves de O & P'. The entire consignment filled 62 crates, but the price the STN received, just 3 livres per volume, probably covered only the cost of the paper and typesetting.³⁰ This was probably far from sufficient to cover additional costs of illustrating and new copy for an extravagantly illustrated *édition de luxe*.³¹ This desperate measure to realise capital tied up in this unsold stock – amounting to 800,000 sheets of paper – helps to explain the STN's business failure. But the failure was also political – the French authorities, pushed by Moutard, had persistently thwarted the STN's calculations by refusing to allow the free

³⁰ BPUN, MS 1028, Journal Ci, fo. 424.

³¹ Assuming the paper used cost a standard 9 *livres* 10 *sous* per ream, the cost of the paper for the editions Moutard acquired was around 15,200 *livres*, or just over half of the purchase price. On a standard edition (say an octavo with at most one or two illustrations), and with a normal print-run (in the region of 500-2,000, as for the *Descriptions des Arts*), paper costs were reckoned to be about half of production. But the production costs for the *Descriptions* were inflated by specially commissioned extravagant illustrations and the costs of acquiring new articles to expand on the Parisian edition.

circulation of the STN edition inside France. In 1775-6 it was seized three times at Paris customs and in early 1781 a consignment of 65 copies were seized at Dijon.³²

Figure 12.12. The STN's top ten editions by volume of printing paper used

Edition	Sheets used	Proportion
<i>L'Encyclopédie</i>	2,864,250	16.17%
<i>Descriptions des arts et métiers, faites ou approuvées par Messieurs de l'Académie royale des sciences de Paris</i>	2,599,970	14.68%
<i>Sainte Bible (la), qui contient le Vieux et le Nouveau Testament (2 vol. 1779 edition)</i>	1,166,562	6.59%
<i>Tableau de Paris (4 vol. 1782 edition)</i>	798,225	4.51%
<i>Sainte Bible (la), qui contient le Vieux et le Nouveau Testament (2 vol. 1773 edition)</i>	619,038	3.49%
<i>Questions sur l'Encyclopédie</i>	535,000	3.02%
<i>Voyage au Pôle austral et autour du monde, fait sur les vaisseaux de roi l'Aventure & la Résolution en 1772, 1773, 1774 & 1775</i>	470,316	2.66%
<i>Oeuvres complètes de Alexis Piron</i>	430,768	2.43%
<i>Planta gagnant sa vie en honnête homme</i>	384,000	2.17%
<i>Histoire philosophique et politique des établissements et du commerce des Européens dans les deux Indes</i>	346,500	1.96%

In combination, the *Encyclopédie* and the *Descriptions des Arts et Métiers* consumed fully 30.85% of the STN's printing paper purchases. Their importance to the STN's business model and hopes of success cannot be overstated. These two enterprises locked up enormous

³² BnF, MS Fr. 21,933, 'Journal des livres suspendus depuis le 4 Janvier de l'année 1771', fos 70, 73 and 80, consignments addressed to Saugrain, Prud'homme and Berzé respectively; Michel Schlup, 'La Société typographique de Neuchâtel (1769-1789). Points de repère' in Schlup (ed.), *L'Édition neuchâteloise*, pp. 61-105, at p. 97.

quantities of capital, particularly once we factor in the price of the high-quality paper used in luxury editions, which was significantly more costly than the paper used in the STN's octavo editions. Correspondence sampled while preparing this chapter suggests that the STN's usual quality paper tended to cost 6 *livres 5 sous* to seven *livres* per ream, whereas for their *éditions de luxe* they paid about 9 *livres 10 sous* 'de France' per ream, a differential of between 36 and 52 per cent. Further, as paper was about half the cost of producing a normal edition, we can estimate that, across their twenty-five year history, somewhere between one-fifth and one-quarter of the STN's total business expenditure was on paper for these two editions.

As if this was concentration of capital were not enough, both enterprises also carried significant political risks. Their financial success ultimately depended on the French government opening its borders to STN reprints, one of which (the *Descriptions des Arts et Métiers*) might reasonably be considered a pirate edition, and the other (the *Encyclopédie*) a religiously heterodox work that had for some time been banned.³³ The STN's third most paper-hungry speculation, a luxury edition of the *Bible*, though primarily intended for a Swiss consumption, also had little chance of entering France unmolested, since it was a Protestant translation, and hence banned. All told, then, the Neuchâtelois publisher, whose main market by sales volume was France, tied up perhaps 50 per cent of their capital in three editions *de luxe* whose right to sell in the French market was, at the very least, precarious. Nor were these their only vulnerable high-cost ventures. Other best-selling texts with high paper costs and a legal status at best dubious included Mercier's *Tableau de Paris*; the abbé Raynal's *Histoire philosophique ... des deux Indes*, the book which according to Jonathan Israel was

³³ On the struggles to circulate the *Encyclopédie* see Darnton, *The Business of Enlightenment*.

the Enlightenment's 'most devastating single blow to the established order';³⁴ Voltaire's *Questions sur l'Encyclopédie*, a work confiscated 41 times by Parisian customs inspectors between 1771 and 1786;³⁵ and Le Scène Desmaison's *Contrat Conjugal*, over 4,141 copies of which, the entire edition, were seized at Versailles and impounded in the Bastille.³⁶ Clearly the STN was heavily exposed. Tighter policing from August 1777 made this ever more problematic.

It was this combination of capital-intensity and uncertain sales that made the STN's demand for paper so volatile. If they could have guaranteed sales, their cashflow could have guaranteed liquidity; if the books consumed less capital, they could have diversified their catalogue, or weathered slow sales of a particular volume. As it was, they relied on their ability to ship large numbers of individual titles in a relatively short time. **Figure 12.13** shows one possibly typical case, the *Journal et anecdotes intéressantes du voyage de Monsieur le comte de Falckenstein*, a topical work which recorded the visit of the Austrian Emperor to France whilst travelling under an assumed name. The STN recorded a print run of 1003 copies on 21 August 1777. By 25 October of that year, they had sold half the stock. It took four more years to sell half the remaining stock: they reached a stock level of 25% on 22 May 1781. They never fully sold out, and indeed, thirteen volumes were returned on 25 January 1794. More than six years after printing the volume, 9% of the original print-run remained unsold.

³⁴ Jonathan I. Israel, *Democratic Enlightenment. Philosophy, Revolution, and Human Rights 1750-1790* (New York: Oxford University Press, 2011), p. 414.

³⁵ Robert Darnton, *The Corpus of Clandestine Literature in France, 1769-1789* (New York: Norton, 1995), p. 157.

³⁶ Simon Burrows, *The French Book Trade in Enlightenment Europe II: Enlightenment Bestsellers* (London: Bloomsbury, 2018), pp. 119-120.

Sales of 'Journal et anecdotes intéressantes du voyage de Monsieur le comte de Falckenstein'

The line represents inferred stock levels from printing and sales records. Points represent the STN's own periodic stocktakes.

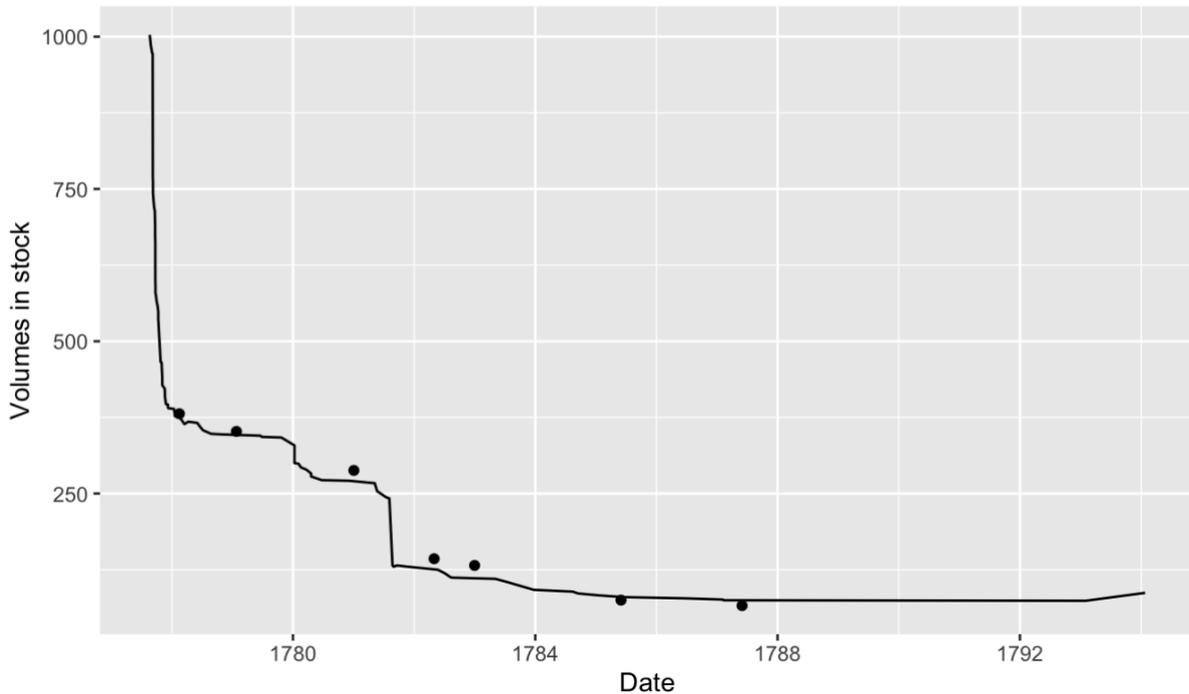


Figure 12.3

It is hard to tell how typical the *Journal et anecdotes* is, because we have limited print run data and there are periods where the ledgers are lost. Nonetheless, **Figure 12.14** can provide a rough indication of the rhythm of the trade. Of 82 editions with a known printing date, 26 had to be ruled out because the precise print-run data was incomplete, that is, the number of recorded sales exceeds the recorded print run, suggesting that print run data was inaccurate or that there had been significant returns, undetected reprintings, or uncertainties around precise editions sold. This left 56 editions whose cumulative sales we could accurately track over time. **Figure 12.14** shows how many weeks it took to sell 50%, 75% and 90% of the original stock, giving the median, first and third quartiles to give a sense of the range of possible situations.

Figure 12.14. It typically took more than a year to sell out an edition

Stock sold	Editions ($n = 56$)	Weeks to achievement		
		<i>1st quartile</i>	<i>Median</i>	<i>3rd quartile</i>
50%	52	9.86	20.2	65.7
75%	38	21.4	54.1	99.9
90%	31	30.4	73.1	167.0

Of the 56 editions about which we can be confident, only 38 (about two-thirds) ever sold more than 75% of the recorded stock. The median edition took slightly over a year to achieve these sales. But there was considerable variation. Some editions needed less than three months to offload the first 50% of their stock but over a quarter took more than a year. On regular turnover, it seems it typically took about a year to sell off the first 75% of a print run, but there was significant variations. This variability was likely a key driver in the volatility of the STN's demand for paper, because so much of their capital was tied up in the paper costs of unsold stock and concentrated in a small number of key editions. This concentration meant that the variability could not be smoothed out and the risk of exposure was high. Unless the STN were uniquely bad at predicting demand for their books, it seems likely that this variability drove volatility in the European paper market as a whole.

3.2. General demand: how much paper did the book trade consume?

The STN's demand for paper allows us to develop a clearer idea of the probable consumption of printing paper in the French market as a whole. If the 'power law' distribution revealed in **Figure 12.10** holds for eighteenth-century publishing generally, the trade in printing paper hinged almost entirely on publishers' decisions to proceed with individual blockbuster editions. On the basis of our evidence here, this remains speculation. Nonetheless, the STN

does provide insights into European publishing as a whole. It was a major consumer of printing paper, running four presses within months of setting up shop, and twelve at its moment of peak production around 1777.³⁷ This was as many presses as the largest of the metropolitan printing houses in Paris and provides evidence of the scale of the STN's ambition.³⁸ But it also helps us to estimate the total scale of French production.

As we have noted, previous work suggests that French annual demand for paper around this time was probably around 300,000,000 to 700,000,000 sheets, though this total included letter-writing paper, *chancellerie* paper and wallpaper. Paper-making was, then, a veritable mass-production industry, despite its artisanal base and hand-crafted product. But, assuming printing paper to be the most significant part of demand, how accurate were these estimates?

In *Revolutionary News. The Press in France 1789-1799*, Jeremy Popkin claims that a single press could produce some 6,000 impressions per day (or 3,000 sheets printed back and front), if worked around the clock by a team of physically strong men, capable of placing and replacing paper, inking, and pulling a heavy lever back and forwards more than four times per minute.³⁹ While some French revolutionary newspapers may have come close to such output, equivalent to 125 sheets printed back and front per hour, commercial book publishers like the STN did not. In their year of maximum production, 1782, the STN's twelve presses seem instead to have had, according to our calculations, an output of 2,393,858 sheets. This

³⁷ Curran, *The French Book Trade I*, ch. 1.

³⁸ See note 5 above.

³⁹ Jeremy D. Popkin, *Revolutionary News. The Press in France, 1789-1799* (Durham N.C.: Duke University Press, 1990), p. 82.

equates to approximately 199,500 sheets per press or about 550 sheets per press per day, or a little less than one-fifth the maximum output suggested by Popkin.

Why the discrepancy? There are several likely reasons. First, Swiss printing houses in the 1770s and 1780s would rarely, if ever, have worked round the clock, and probably only worked in daylight hours. This alone would cut capacity by more than half, even before allowing for workers taking time off on Sundays and holy days. Further, in revolutionary Paris night work and working on a Sunday or holy day carried a wage premium of 25-50%. This might be worth paying in times of political turmoil and surging demand, but in more normal times it was more economical to install extra presses and work only in daylight.⁴⁰ Second, printing books probably required a little more care with placement of pages than newspapers, thereby slowing output. Third, printing-shops rarely ran all their presses at once, whether this was due to insufficient work, setting up for new works for printing, or presses being out of commission awaiting repairs. In May 1770, during a systematic inspection of the Parisian print shops, inspectors found only 194 out of 309 presses rolling: only in one, a six-press operation run by the printer Simon, did they find every press in use.⁴¹ Finally, we also need to account for what former FBTEE researcher Mark Curran calls the 'dark matter' of STN printing, the material that we know was there but have not recorded from our sources: primarily job printing for local businesses and secular and religious authorities in Neuchâtel and the STN's journalistic products, notably the *Journal Helvétique*, which had a circulation fluctuating around the 200-300 mark.⁴² These are unlikely to have used a great deal of paper,

⁴⁰ Ibid., p. 68.

⁴¹ BnF, MS Fr. 22,081 fos 343-348, 'Visites des Inspecteurs de la Librairie, Mai 1770'.

⁴² Michel Schlup, 'Diffusion et lecture du Journal helvétique au temps de la Société typographique de Neuchâtel' in Hans Bots (ed.), *La Diffusion et lecture des journaux de langue française sous l'ancien régime* (Amsterdam: APA Holland University Press, 1988), pp. 59-71.

particularly given the low population of the principality, but they may have tied up presses.⁴³ When all these factors are considered, the STN's printing presses seem to have been out-putting at close to standard capacity hour-for-hour worked.

On this basis, the STN's consumption of printing paper can be used to estimate the total paper required annually by the French printing industry in the 1770s and 1780s. Using the Parisian inspection report of 1769 (which listed 307 presses in Paris) and a 1764 survey of the provinces (which listed 709 more in 292 print-shops), Thierry Rigogne suggests that there were about 1016 legal presses in operation in France. He adds that the number of presses was kept fairly stable by the Bourbon government from 1700 to the French revolution. The 1764/1771 data is incomplete, however, for Rigogne notes that information on Lorraine is missing entirely from the 1764 survey and the same is true for eight smaller printing centres (with at least nine printers).⁴⁴ In fact, there were at least twenty printshops in Lorraine: the *Almanach de la Librairie* of 1781 lists individual printer-booksellers at Bar-le-Duc, Bruyères, Dieuze, Dillingue, Epinal, Luneville, Neufchateau, Pont-à-Mousson, Saint-Dié, Saint-Mihiel and ten more in Nancy, a major printing centre.⁴⁵ Assuming they each had, on average, the same number of presses as other French provincial publishers, it seems there were, during the final two decades of old regime, around 321 printshops in the French provinces, and that they operated about 780 presses. This takes the total number of legally operating presses to 1087. If we take the STN's output of 199,500 sheets per press as standard, this would suggest that France's total demand for printing paper was around 216,856,500 sheets per year. This does

⁴³ For example, only 10,000-15,000 sheets were needed each year therefore to produce a monthly 128 page in-16 edition (i.e. 4 sheets x 12 months x 200-300 subscribers).

⁴⁴ Thierry Rigogne, *Between State and Market. Printing and Bookselling in Eighteenth-Century France* (Oxford: Voltaire Foundation, 2007), p. 127, esp. n. 93.

⁴⁵ Antoine Perrin (ed.), *Almanach de la librairie* (Paris: Moutard, 1781), pp. 36-81.

not include the 'dark matter' discussed above, which given our presses were running near capacity, might have increased that figure by perhaps 10 per cent at most. Thus printing alone takes us almost to the lower end estimates for paper requirements, that is to say around 250,000,000 sheets per year.

The STN's use of other types of paper offers further evidence about the paper consumption of any medium to large enterprise operating in international markets in the later eighteenth-century. Assuming that they were not trading paper on their own account locally, or using writing and *chancellerie* paper in bespoke printing jobs for local authorities, businesses and private individuals, they seem to have been consuming such paper in startling quantities. Yet even if we limit our estimates to the physical evidence in the archives, the STN's 30,000 business letters required around 30,000 sheets of writing paper and the bound volumes containing their accounting and stock records and copies of their out-letters required perhaps 50,000 sheets more.⁴⁶ While 80,000 sheets across 25 years equates to little over 3,000 sheets per year, it hints at the volume of paper needed to run any business needing to trade at a distance in increasingly integrated national and international environments, operate the complex accounting systems prevalent by the late eighteenth-century, and maintain systematic stock-controls. The discovery that the STN likely used at least as much paper for its internal record-keeping as in external correspondence underlines the centrality of paper for

⁴⁶ Up to a ream might be required for each of the STN's *Brouillards* and *Grand Livres*, probably originally about 15 in number, of which only five *Brouillards* survive. They also kept draft 'Copies des comptes' for the *Brouillards* and possibly the *Grands Livres* too, allowing us to double this total. Narrow half sheets were used in the Stock take records (the *Rencontres du Magasin*), perhaps originally totalling fifty volumes. We also have four 'Livres de commissions' covering the STN's ten busiest years, so there may have been seven or eight originally. Add in approximately 20 Letter books, eleven of which survive, plus 30 or 40 petty account and cash books (of which only a couple survive), records of paper purchases, payments to workers (*banque des ouvriers*) and wagoners (*lettres de voiture*), copies of *lettres de change* and other miscellaneous documents and it is clear that the STN records would have filled at least 200 ledgers of all sorts and sizes and lengths, requiring approaching 100 reams, much of it Chancerie paper. For a listing of surviving STN documents see Jacques Rychner, 'Les Archives de la Société typographique de Neuchâtel' in Schlup (ed.), *L'Édition neuchâteloise*, pp. 179-209.

all business at scale in the period. And these figures do not include scratch paper used for calculations or daily notes and thrown away

From these figures it might be possible also to try to derive the total volume of non-printing paper being produced in the later *ancien régime*, in much the same way that this article chapter has done for printing paper. However, such work would require significant further research into the volume of businesses in France and letter-writing volumes to inform its preliminary assumptions. Suffice it for now to note Warren J. Scoville's observation that there were around 600 paper mills in France across the final third of the eighteenth century, and that between them, according to informed contemporary testimony, they operated some 900 to 1,050 vats. Government officials reckoned the average mill's output at two to ten reams per day, save for a handful of large-scale enterprises running anything up to nine vats, but generally estimated most mills were making close to the maximum 2,000 to 3,000 reams per year, that is to say 1,000,000 to 1,500,000 pages each, if free to operate all year. This would put total French national production at or just above the upper end of our estimate of 300,000,000 to 700,000,000 sheets per year. Inadequate water flows however seem to have restricted mills in many areas to perhaps just eight months of operation per year.⁴⁷ An output of 600,000,000 to 700,000,000 sheets per year seems credible. The STN evidence suggests that perhaps something over half of this output would have been used for purposes other than printing.

⁴⁷ Scoville. 'Government Regulation and Growth in the French Paper Industry', p. 84. These figures seem more conservative than those for the sixteenth century suggested by Febvre and Martin in *The Coming of the Book*, p. 40. Febvre and Martin estimate that as early as the sixteenth century the French paper industry needed to output 450,000 to 900,000 reams annually (i.e. 225-450 million sheets) to supply the country's 500-1,000 presses. Their calculations ignore the many reasons why presses (and paper mills) seldom worked at capacity, as outlined above.

4. Sourcing paper: evidence from the letters

So how did the STN develop its network of paper suppliers to meet a fluctuating need and, until 1782, a generally upward trend in demand? The STN's outgoing correspondence provides some clues. Altogether the STN archive contains correspondence to and from sixty-nine identified '*papetiers*'.⁴⁸ As mentioned above, the in- and out-letters form two discrete datasets. For the inward correspondence, the underlying data is complete, but the letter data available in the FBTEE database is not very detailed. We know how many letters each *papetier* sent to the STN, and the dates of the first and last letter, but we do not know when each individual letter was sent. The outward correspondence, by contrast, has gaps, but for the periods that *are* attested, we have access to each individual letter. Thus for two key periods, 1770-71 and 1776-81, we can say precisely how many letters the STN sent to each *papetier*, and can glimpse the content of the letters. In what follows, we assume that the number of letters the STN sent or received is a rough indication of how much paper they were ordering: presumably they would correspond more frequently with suppliers who were supplying them with more paper. Since we know the *papetiers*' addresses, we can then use this letter-data to try and work out where the STN's paper was coming from.

There are three key caveats to this analysis. First, although we know where the *papetiers* operated, this is not a perfect guide to where the paper actually came from. According to the 1762 and 1798 editions of the *Dictionnaire de l'Académie*, a *papetier* could be either 'l'ouvrier qui fait le papier' (a worker who manufactures paper), or 'le Marchand qui le vend' (the merchant who sells it). We cannot be certain which of the *papetiers* were merchants and which were manufacturers, and of course the merchants could in principle have obtained the

⁴⁸ This figure actually includes one named 'marchand de papier' and one 'directeur de Papeterie'.

paper they sold from anywhere. We assume in what follows that all the *papetiers* were either manufacturers, or obtained their stock locally. This is obviously open to revision.

The second problem is that not all the *papetiers* were exclusively in the paper trade. Nine of the *papetiers* in the database were assigned more than one profession in the source material. A case in point are the Besançon booksellers-*papetiers* Charles-Antoine Charmet and his wife. Although Charles-Antoine first dealt with the STN when selling paper products in 1769 as a representative of the family business, by December 1771 he was buying books from the STN on his own account.⁴⁹ When we turned to the out-correspondence, we were able to examine the letters, and exclude those which had nothing to do with paper from the count. This was impossible for the in-correspondence, so we tried excluding these eight multi-professional *papetiers* from the analysis, but found that it made very little difference to the overall picture.

Finally, we know that the list of *papetiers* in the FBTEE source material was incomplete. Darnton reveals that Claudet provided 100 reams of paper to the STN for the *Encyclopédie*; in the database, he is identified only as a merchant. We were able to include his 75 letters in our consideration of the in-correspondence, but discovered his paperselling activities too late to include him in our analysis of the out-letters. Darnton also mentions three merchants or millers who did not appear in FBTEE's source material: Duplain and Joannin, Lyonnaise merchants, and Vimal, a miller in Ambert. Presumably these men only dealt with the STN over the *Encyclopédie*.⁵⁰ We were unable to include these suppliers in the study below,

⁴⁹ Most of Charmet's letters relate to bookselling not paper, and indeed he has become known to historians through a key case study in Robert Darnton's award-winning study of the French clandestine book trade, *Forbidden Best-Sellers of Pre-Revolutionary France* (New York: Norton, 1995) (where he is erroneously identified as Jean-Félix Charmet). Charmet's in-letter dossier (BPUN, MS 1134) can be consulted at: <http://robertdarnton.org/literarytour/manuscripts/> consulted on 31 March 2020.

⁵⁰ Darnton, *The Business of Enlightenment*, pp. 190-191.

because we have no data on their correspondence; but the fact that the STN was using these men to help print the *Encyclopédie* extends the story we tell below, about how the publisher was extending its supply network to Lyon and beyond during the 1770s.

Despite these caveats, the data do give us a good indication of where the STN sourced its paper. **Figure 12.15** gives a snapshot of all the letters the STN received from its *papetiers* between 1769 and 1794. The size of each circle is proportionate to the number of letters the STN received from *papetiers* based there. Though our 67 STN *papetiers* are spread out across 39 different communities in France and Eastern Switzerland, the STN clearly sourced most of its paper from a constrained set of towns on the Franco-Swiss border and around Lyon. Paris and its neighbours are insignificant, as are German-speaking centres of Switzerland, with the exception of Berne – the most politically influential city in the country. The key centres now emerge as Besançon, Lyon, Vuillafans, closely followed by the Swiss centres of Bassecourt and Fribourg and the French towns of Meslières, Luxeuil, Strasbourg and Pontarlier.

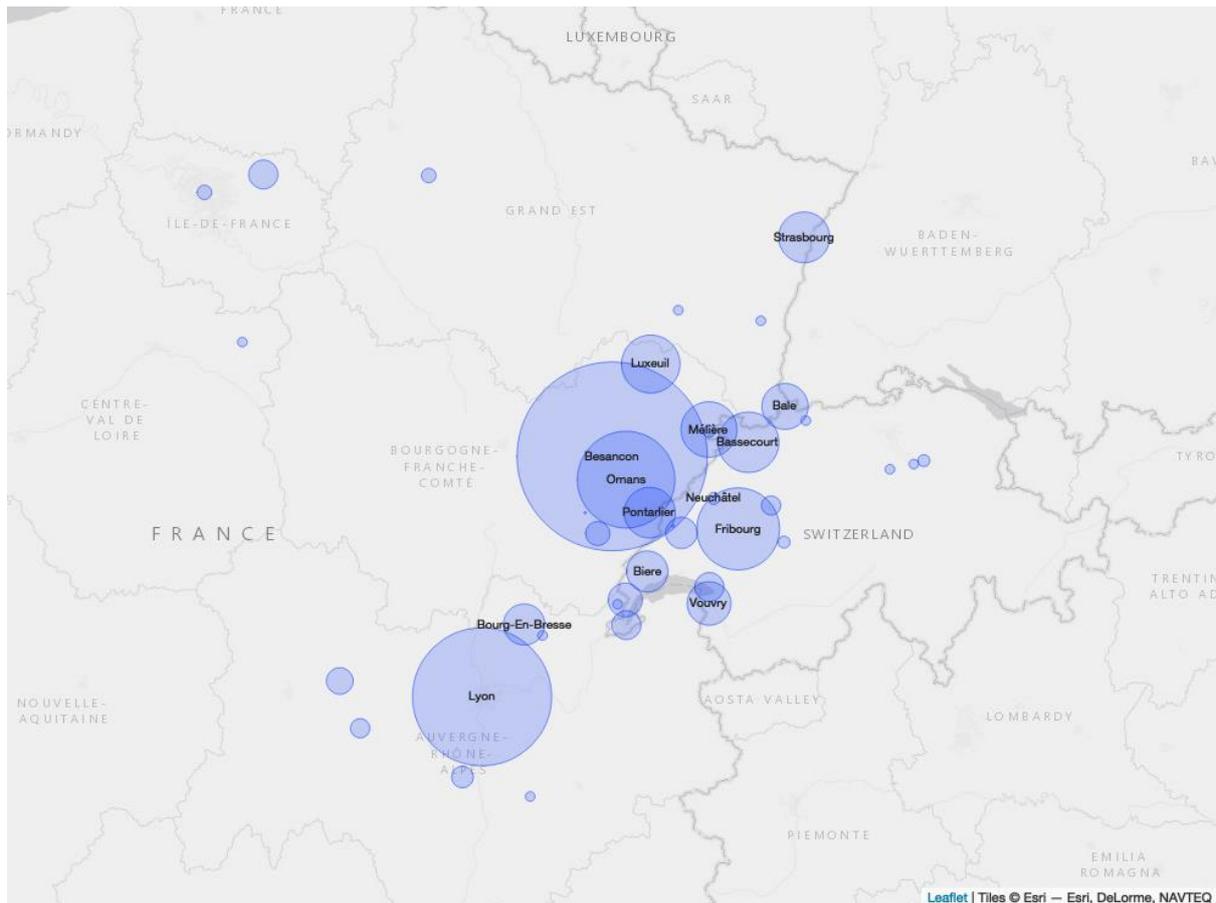


Figure 12.15

By contrast, as **Figure 12.16** shows, the STN's books went much further afield. Here each circle is proportionate to the number of sheets the STN sold there in book form. Though the STN did have key markets in the Franco-Swiss borderlands, they also sold the books they printed in St Petersburg, Moscow, Warsaw, The Hague, Brussels, Maestricht, Hamburg, London, Lisbon, Madrid and many smaller European centres. As **Figure 12.17** shows, the pattern of correspondence with *papetiers* is exactly the inverse of the publisher's sales as measured in sheets. 63% of net sales (sales minus returns) were to towns more than 100km from Neuchâtel, while 69% of the letters they received from *papetiers* came from less than 100km from Neuchâtel. The general paucity of *papetier* correspondence in the archive (there are only 1,221 in-letters) suggests that the STN may have had yet more local suppliers in Neuchâtel. It appears they were effectively a large-scale paper exporter, drawing in raw

materials from the local area, adding value, and dispatching it across Europe. Of course, the picture might change if we could discover how much paper the STN was ordering from individual suppliers.

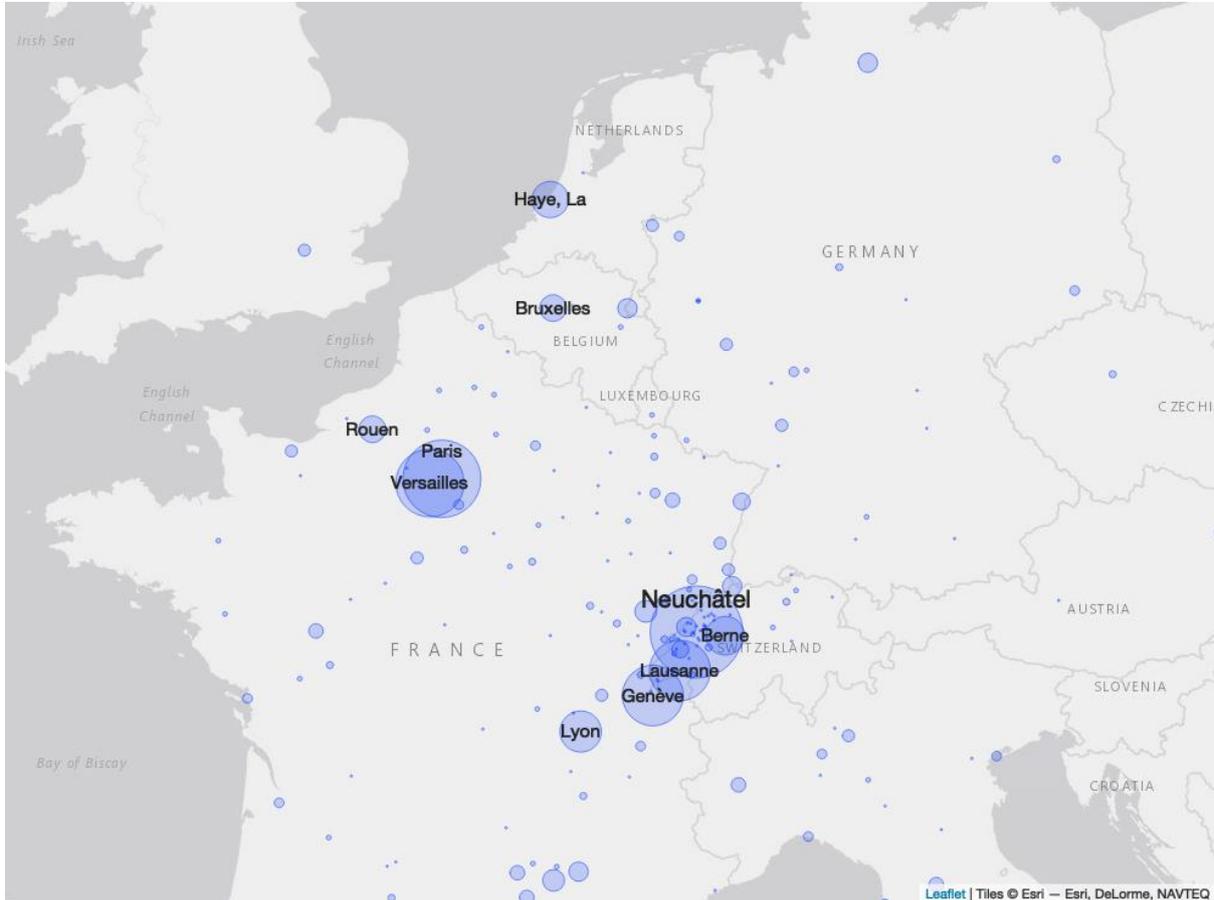


Figure 12.16

Figure 12.17. *Papetiers'* in-letters compared to sheets sold

Distance from Neuchâtel	<i>Papetiers'</i> letters received ($n = 1,221$)		Net sales of books (in sheets) ($n = 233$)	
< 100 km	845	69%	4,730,530	37%
> 100 km	376	31%	8,027,788	63%

How did the STN's supply network change over time? The in-letters can give us a rough idea of how many suppliers the STN were in contact with at any given time, because the database records the date of the first and the last letter the STN received from each *papetier* (**Figure 12.18**). This data suggests that up to the peak of book production in 1782, the STN were continually expanding their supplier network. There were three main periods of network growth. The first was during the STN's establishment period, 1771, as the STN intensified its publishing activities, in particular by counterfeiting Voltaire's *Questions sur l'Encyclopédie*, abetted by the chief *philosophe* himself. The second appears in 1773, a year when our figures reveal the STN's demand for paper more than doubled (**Figure 12.7**). The third was in 1777 to 1778, when the number of *papetier* correspondents jumped by around 40% as the STN scrambled to source paper for the *Encyclopédie* in 1777-1778. Presumably this is also when the STN first contacted Duplain, Joannin and Vimal, the suppliers identified by Darnton who do not appear in the FBTEE database. Thus the growth of their supply networks at this time was probably in reality even more pronounced than the FBTEE data suggests. This is hardly surprising. From 1776 to 1778, the STN's thirst for paper increased nearly fivefold (**Figure 12.7**). Although their demand fell back in 1780, they seem to have maintained their supply network for the second smaller peak of 1782. Afterwards the network collapsed. Between 1782 and 1784 almost two-thirds of long-term *papetier* correspondents ceased to write. Even long-term business associates appear to have been bailing out. The likely cause was a collapse of confidence. By 1783-84, the STN's debt problems were probably well known and, as we have seen, the publisher was hit simultaneously by new French legislative measures targeting cross-border publishers and a Europe-wide credit crisis. In such circumstances, it would be understandable if the STN's *papetiers*, fearing non-payment for their goods, abandoned the ailing business.

The STN's paper supply network grew until 1779

Total papetiers with whom the STN were in contact, judged by the first and last date of correspondence.

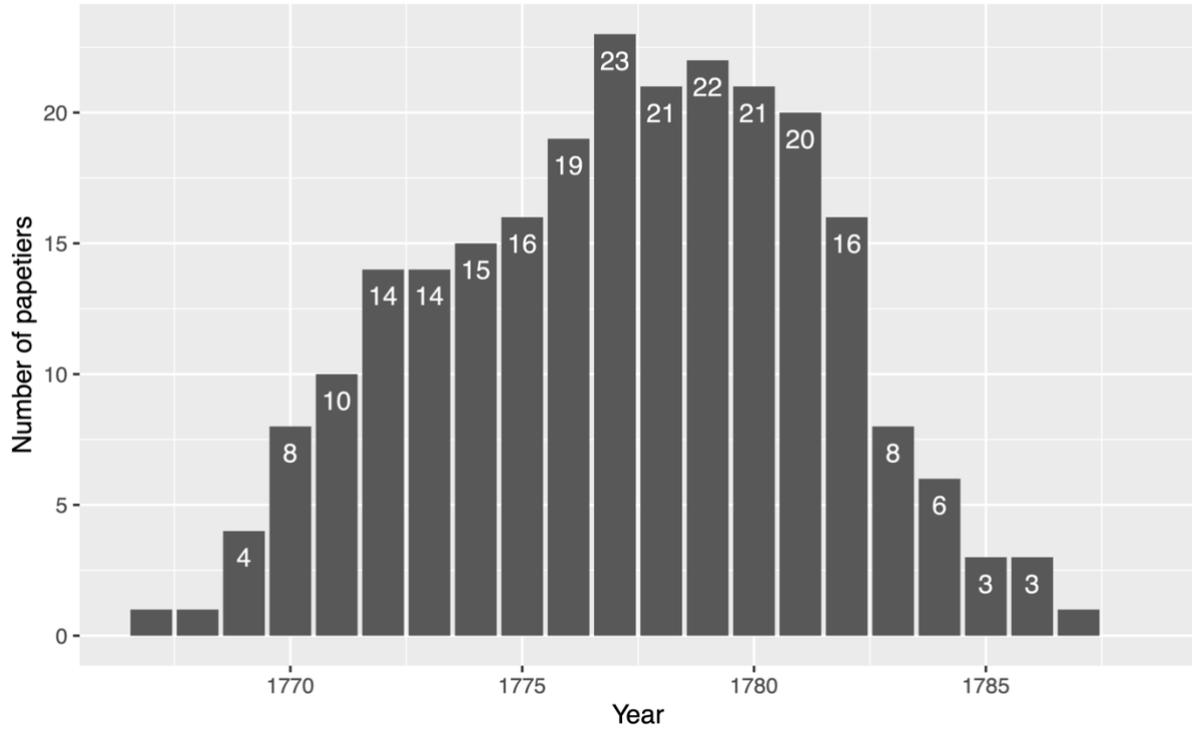


Figure 12.18

As the STN's paper supply network grew, so did the average distance of the papetiers from Neuchâtel

Mean distance from Neuchâtel of active papetier correspondents, based on first and last date of in-letters.

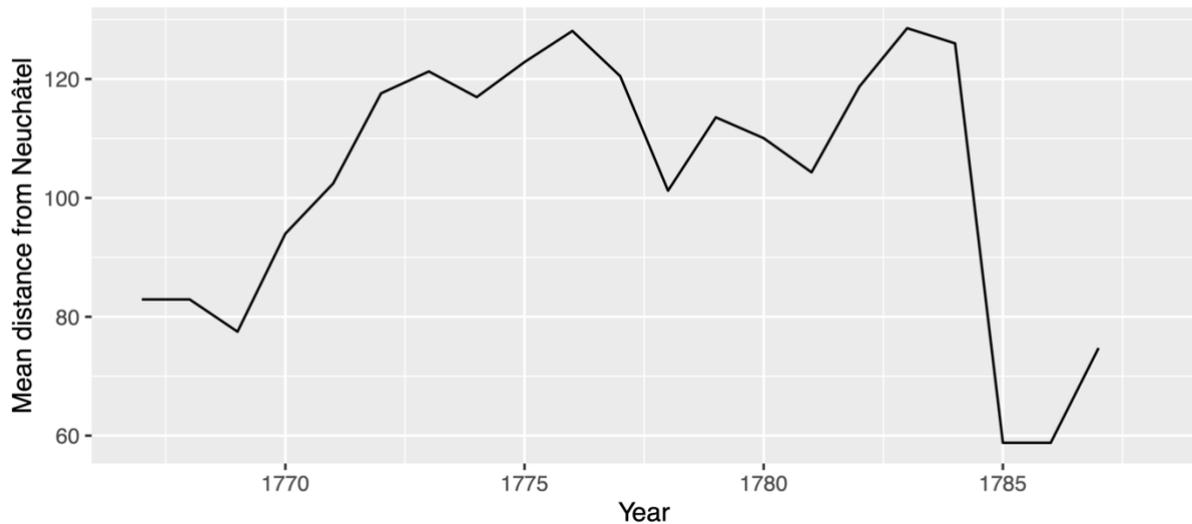


Figure 12.19

As the STN established relationships with more *papetiers*, the geography of its supply chain altered. As **Figure 12.19** shows, based on the in-letters, it appears that from 1769 to the mid-1770s, the STN's paper came from further and further away. Over the course of the STN's life, Besançon (74km away) and Lyon (211km away) became the most important centres, spawning more than half the *papetier* letters the STN received. If we examine the out-letters, however, it turns out that Besançon and Lyon played different roles in the STN's development. **Figures 12.20 and 12.21** show the destinations of the STN's out-letters to *papetiers* in the two periods 1770-71 and 1776-79, allowing us to see how the geography of their paper supply altered over time. For these two periods, the records of the outward correspondence appear to be complete. We also know precisely how many letters were sent to each correspondent during this period, and have been able to remove any letters unrelated to paper. There are also 63 out-letters to *papetiers* from 1776-79 whose text and precise dates have been lost, but whose existence is known from MS1106, an index of out-letters prepared by the STN. Thirteen of these 63 letters were sent to Charmet and Robert et Gauthier who were also printers or booksellers. By the late 1770s, however, we know that both these correspondents were trading primarily or exclusively with the STN for books, rather than paper, so we excluded their thirteen letters from the count. Since **Figure 12.21** covers twice the amount of time as **Figure 12.20**, the circles on Figure 12.20 have been doubled in size so they are at the same timescale.

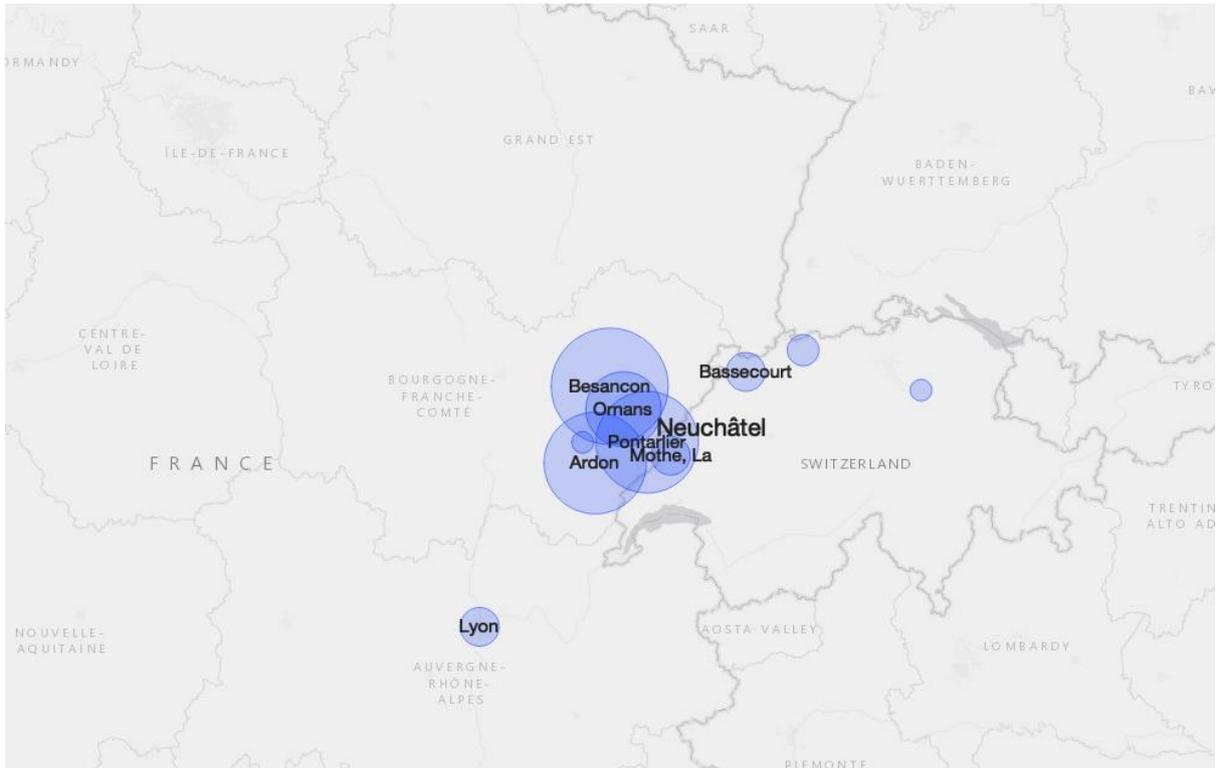


Figure 12.20: Destination of STN out-letters, 1770-71

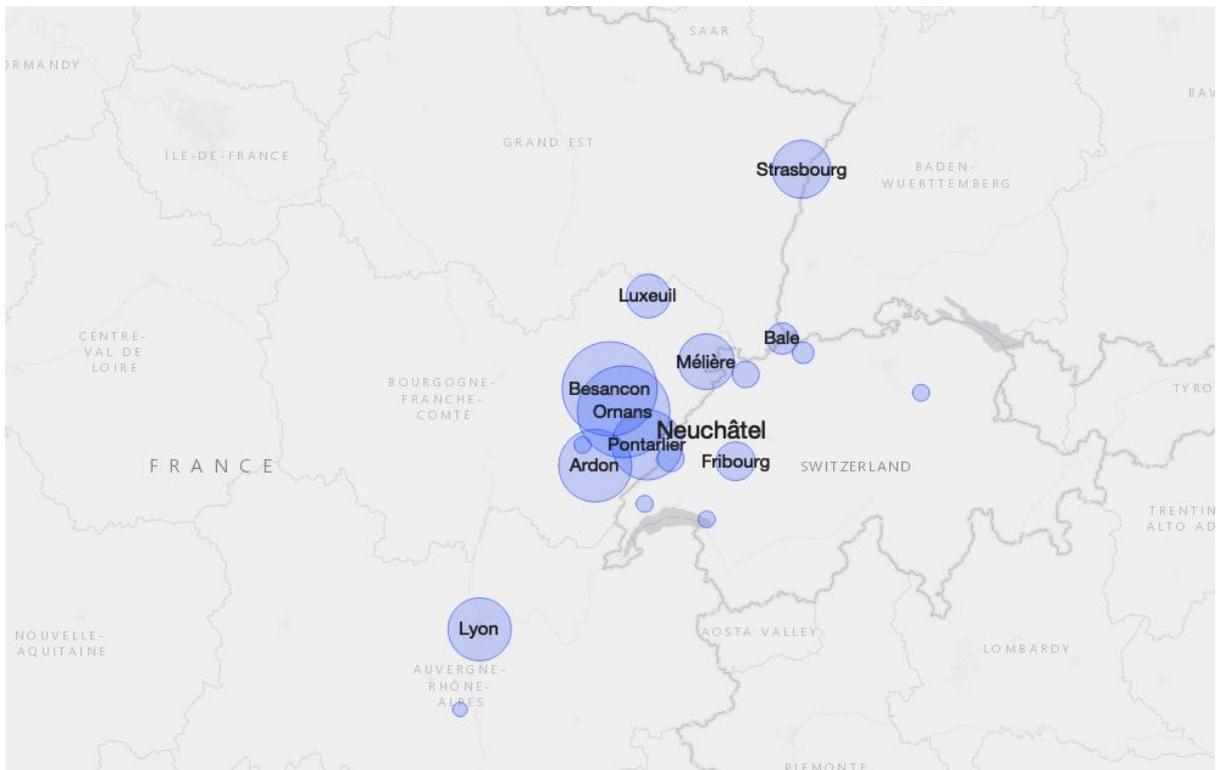


Figure 12.21: Destination of STN out-letters, 1776-79

Figures 12.20 and 12.21 reveal how the STN expanded its supply network over time: they sought new suppliers in the northeast and southwest, and their correspondence with suppliers in the core Besançon region possibly contracted slightly (though there are many ways we could explain this slight dip in out-letters). While the in-letters gave the overall impression that Lyon and Besançon were dominant features in the STN's supply network, these two figures tell a different story. It is true that Besançon and Lyon were key paper sources in both periods, but it seems that over time, the STN diversified its paper supply, and a number of smaller centres became more significant, notably Strasbourg, Meslières, Fribourg and Vuillefans. As we will see, the STN perhaps drew on Lyon merchants as reliable source of large quantities of quality paper for major works, but to meet shorter term needs they seem to have kept a regular contact with more locally-based millers, with whom the turn-around time for correspondence and transport was faster, in order to draw on their stocks rapidly as they became available.

How do we explain this particular pattern of development? Why did the STN's paper supply network extend along this Lyon-Strasbourg axis, and not southeast into Switzerland, or northwest along the road to Paris? Transport links may have been one issue. Likewise, size of centre, ability to ensure a regular supply, and local production capacity were probably significant to the STN when weighing risk and reward in sourcing paper stocks. But it appears that language was an important factor. The STN were a Francophone publisher, and all the their most prolific *papetier* correspondents appear to have had Francophone backgrounds. Of the upper quartile of correspondents (based on in-letters), two were based in French-speaking Switzerland (Romandy), thirteen in France, and only one in a majority German-speaking town, Fribourg. Even the Fribourgeois correspondent was named 'Fontaine', however, suggesting that he, too, was Francophone. This preference for Francophone suppliers is particularly surprising given the STN's proximity to the German-

speaking Basle, only 81 kilometres distant from Neuchâtel and a long-established centre of paper production which in earlier centuries had more paper mills than anywhere in Europe.⁵¹ Yet the STN only corresponded with three paper-making enterprises there, of which the Teutonic-sounding Nicolas Heusler and his later partnership Stampfer and Heusler sent only one and two surviving letters respectively. Only the French-sounding Jérôme Blum (21 in-letters, 21 known out-letters) corresponded over any length of time. Thus the STN's trading history suggests that they were happy to peddle their wares around Europe. However, when it came to buying raw materials, they preferred to do so only in French.

The STN appear therefore to have preferred a French-speaking supplier to one that was nearby. Cultural proximity mattered more than physical proximity. Though it is true that the majority of the *papetier* in-letters came from less than 100km away, there is actually no strong correlation between distance and the number of letters a *papetier* sent or received. We calculated the correlation between distance from Neuchâtel and number of letters using Spearman's rank correlation coefficient, examining both the in-letters ($\rho = -0.15$, $p = 0.11$) and the known out-letters ($\rho = -0.12$, $p = 0.27$). On both datasets, there was indeed a negative correlation—i.e. the further the supplier, the fewer the letters—but the correlations were very slight ($\rho < 0.2$), and the high p-values ($p > 0.05$) suggested that the observed correlations were unreliable. The STN's supply network was certainly geographically bound. Their furthest known *papetier* operated at a distance of 400km from Neuchâtel. But within the supply network, factors other than mere distance appear to have been more important to the STN, particularly as they extended their supply base during the 1770s.

⁵¹ Febvre, Martin, *The Coming of the Book*, p. 42, says there were seven mills around Basel in 1570.

The STN's preference for French-speaking *papetiers* was not mere chauvinism. There were good reasons to rely on centres such as Lyon and Besançon. With thirteen printer-publishers and thirty booksellers listed in the 1781 *Almanach de la Librairie*, Lyon was France's second biggest publishing centre by a significant margin and had a high demand for paper. Lyon was famous for its textiles, and had strong links to the South German rag trade; it therefore had a good source of rags, an essential raw material for paper in this period. Moreover, Lyon's printing industry likely demanded all qualities and types of paper, producing substantial numbers of *éditions de luxe* alongside more popular fare. This would explain why the STN's correspondence with Lyonnaise *papetiers* increased in the late 1770s, as they began to invest heavily in luxury editions such as the *Encyclopédie*, *Description des arts et métiers* and *Tableau de Paris*. Darnton provides some additional context in his study of the *Encyclopédie*. According to his study, there were 13 *papetiers* who supplied the STN for their *Encyclopédie* edition, six of whom were paper merchants, and seven of whom were millers. All five Lyonnaise *papetiers* were merchants, as was Schertz, who was based in Strasbourg. In contrast, the seven millers tend to be based in smaller communities: Gurdatt in Bassecourt, Morel in Meslières, Fontaine in Fribourg, Vimal in Ambert, Petitpierre in La Motte, Planche in Vuillafans and Desgrange in Luxeuil. It seems that the STN increasingly turned to specialist big-city paper merchants as their needs grew. Large-scale merchants in centres like Lyon, Strasbourg and perhaps Besançon likely had their own extensive supply networks, allowing them to meet the STN's growing demand.

We have assumed thus far that in the STN the number of letters exchanged is a rough proxy for the frequency of orders for paper (if not the amounts ordered). Reading the out-letters seems to confirm this assumption. The process of ordering paper was complex, involved protracted negotiations over price, quality and delivery dates. Thus although a certain number

of letters did not necessarily correspond to a certain number of orders, it does give an indication of how intensely the STN were negotiating with a supplier to obtain their needs. Typically, the STN and the *papetier* would commence a negotiation with an exchange of samples, and a discussion of the quality and reliability of previous deliveries. If transaction did proceed, the STN would typically order large quantities of paper – typically 100-1000 reams per purchase (50,000-500,000 sheets). They might order as many as 50 reams (25,000 sheets) simply as a sample. Following delivery there would be ritual complaints, further haggling and discussions around payment instruments, especially if bills of credit on trade partners were not honoured. The STN's key concerns – and topics of complaint – were the size, weight and whiteness (*blancheur*) of the paper. These protracted negotiations made it difficult for the STN to secure reliable quantities of adequate paper within its tight production schedule, particularly in a business environment that depended on credit. To counter this problem, the STN seems to have paid some preferred suppliers at once, albeit by paper instruments. There are also signs in the letters that the STN particularly sought suppliers who could meet high and fluctuating demand. Liquidity was clearly a problem.

5. Conclusion: Material, networks, practices

Our data-driven approach has allowed a detailed snapshot of how a single publisher's business practices and strategy shaped its needs for paper, and how it grew its networks in response. A key finding is the complexity the STN's demand for different paper materials, as it sought both printing paper in various qualities and writing and Chancellery papers. Significantly, while the vast bulk of the STN's sales were popular octavo editions, its paper consumption was driven by a handful of luxury and multi-volume editions. As its need for high-quality papers grew, the STN expanded and diversified its supply network, becoming increasingly reliant on a cluster of large merchants, particularly in and around Lyon, rather

than individual millers and suppliers based closer to their home base. This analysis provides us with a further insight into the likely drivers of demand in the paper market. Paper was the major raw material and most significant cost in producing books. Thus if the STN was typical in its reliance on a small number of paper-intensive editions, then book publishing was probably the most significant source of volatility in the paper market, since demand for writing and Chancellery papers was probably much more stable. The practices of the book trade and the fluctuating demand for its most luxury material products that resulted thus probably had an undue impact on paper output and trade cycles. We have also seen how cultural and legal factors impacted on the STN's trade in paper. Whilst the book market was pan-European, the STN preferred to supply itself from sources closer to home, and to enter into negotiations with suppliers who shared a similar cultural-linguistic background. Unfortunately, France was also their most significant market, which left the STN exposed to political risk as the French government clamped down on book imports. It was this risk, combined with over-investment in politically sensitive luxury editions, that brought the company to a disastrous climax and a lingering death, as material stocks – effectively capital locked up in unsold printed paper – built up. Given the way we have inferred the STN's paper usage indirectly, we can only discern a 'fuzzy snapshot' of these realities. A more thorough examination of the in-letters in Neuchâtel could potentially enrich or revise the picture. Nonetheless, our snapshot has been taken through a broad, multi-dimensional, and infra-red lens. It reveals much that would remain invisible by any other method.

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