# Sailing through Troubled Times: The Salvadori Firm of Trento during the Revolutionary and Napoleonic Wars, 1790–1815

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## 1. INTRODUCTION

The Revolutionary and Napoleonic Wars are well-known for having severely disrupted the economy, and especially all trading activities. Since the early twentieth century, when William E. Lingelbach complained about the paucity of historical investigations on the economic aspects of the Napoleonic era,[1] historiography has made many steps forward. There is now a large body of economic history literature on this theme, with some studies taking a broader perspective, and others exploring specific issues.[2] Scholars' attention has focused inter alia on what is usually regarded as a particularly disruptive event, namely French economic warfare, with especial regard to the Continental System.[3] There has been an active debate concerning the latter's impact not only on the size and structure of trade, but also on the pattern of growth of the territories subjected to French domination. It is

1 William E. LINGELBACH, Historical Investigation and the Commercial History of the Napoleonic Era, in: The American Historical Review 19/2, 1914, pp. 257–281.

2 To provide just a glimpse of the diversity of perspectives and geographical coverage, some recent contributions are: Kevin H. O'ROURKE, The Worldwide Economic Impact of the French Revolutionary and Napoleonic Wars, 1793–1815, in: Journal of Global History 1, 2006, pp. 123–149; Robert SPAULDING, Changing Patterns of Rhine Commerce in the Era of French Hegemony, 1793–1813, in: Vierteljahrschrift für Sozial- und Wirtschaftsgeschichte 100/4, 2013, pp. 1–18; Margrit SCHULTE BEERBÜHL, Trading with the Enemy. Clandestine Networks during the Napoleonic Wars, in: Quaderni Storici 143/2, 2013, pp. 541–566; Katerina GALANI, The Napoleonic Wars and the Disruption of Mediterranean Shipping and Trade. British, Greek and American Merchants in Livorno, in: Historical Review/La Revue Historique 7, 2010, pp. 179–198.

3 A still valuable interpretation of the Continental System can be found in Eli F. HECKSCHER, The Continental System. An Economic Interpretation, 1922 (http://www.econlib.org/library/YPDBooks/Heckscher/hksrCS1.html, accessed 15 February 2014). For a more recent account, see Markus A. DENZEL, Vom Scheitern eines Modells. Das Kontinentalsystem als europäischer Wirtschaftsverband, in: Birgit ASCHMANN (ed.), 1813 und die Folgen für Europa. Entgrenzung und Einhegung, Stuttgart 2015 (*in print*). I thank the author for allowing me to read a draft of his paper.

well-known, indeed, that a system of tariffs and regulations was enacted to make the various satellite states, and among them the Italian territories, tributaries to France's interests.[4]

Within this strand of research, historiography initially tended to overemphasize the destructive nature of the French domination by stressing the exploitative nature of the "core" country's policies towards the "periphery" which supposedly, especially in the Italian case, stifled the local industries. This view, however, has been subsequently revised and criticised for several reasons.[5] First, it has been argued that the traditional interpretation failed to take into account that an industry in the proper sense of the word hardly existed at the time, since the Italian economy was still predominantly agrarian, and a modern factory system was lacking.[6] By contrast, economic historians have stressed, on the one hand, the stimulating effect on a number of manufacturing activities – among them the production of raw silk and silk yarns – whose products were marketed within the French empire, and, on the other hand, the long-run modernizing consequences of the French-style reforms in codification and administration, as well as in transport infrastructure. Furthermore, scholars have cast doubt on the Napoleonic state's capacity strictly to enforce trade regulations, and in particular to wage effective economic warfare against Britain, because France had little control over its coastlines.[7] Hence, in spite of the undeniable disturbances that the Revolutionary-Napoleonic period caused in all trading activities, recent research has delivered a more balanced view which also reflects on the historiography concerning the historical region of Tyrol.[8] Statistical reports compiled as a result of Napoleon's endeavour to collect data – which extended to the French allied states and satellites – provide somewhat detailed information on the state of the local economy. Sources of this type, however, furnish only indirect evidence on the impact of economic warfare on the activities of merchants, and the ability of the latter to react. In this regard, complementing the study of institutional sources with a micro analysis can yield fruitful insights.

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4 LINGELBACH, Historical Investigation, p. 272.

5 On this shift in interpretation with regard to the Italian case, see Mario ROMANI, Storia economica dell'Italia nel secolo XIX, 1815–1882, edited by Sergio ZANINELLI, Bologna 1982, pp. 34–41.

6 Ibid., p. 35; see also Alain PILLEPICH, Milan, capitale napoléonienne 1800–1814, Paris 2001, pp. 599–600.

7 On this last aspect, see Michael G. BROERS, The Concept of "Total War" in the Revolutionary-Napoleonic Period, in: War in History 15/3, 2008, pp. 247–268, here p. 259.

8 This study mainly focuses on the Italian-speaking part of historical Tyrol, corresponding nowadays to Trentino. In the eighteenth century this region embraced all the territories of the Prince-Bishopric of Trento and the southern part of the county of Tyrol, a hereditary land of the Habsburg Monarchy which surrounded most of the Bishopric's territory. The long-lasting institutional separation of the two adjoining areas – which already made up a quite well-integrated economic space in the second half of the eighteenth century – was to end in 1803, when the Bishopric of Trento was formally abolished and unified with the county of Tyrol.

Drawing on first-hand material, this essay seeks to cast light on the Revolutionary-Napoleonic period from a micro perspective: that is, from the viewpoint of a single economic agent, the Salvadori firm of Trento, which was a leading merchant house specialized in the manufacture and trade of silk.[9] At that time, the silk industry represented by far the most important manufacturing activity in the region, which was repeatedly subject to foreign occupation, and annexed first to Bavaria and then to the Kingdom of Italy. The frequent institutional changeovers caused growing uncertainty and risks for all business activities, which also suffered from the disruption of international markets. The ensuing impact on the local economy depended however, to some extent, on the ability of merchants to adapt to an ever-changing setting. The Salvadori Archive provides ample evidence in this regard, in that it enables detailed analysis to be conducted on shipments and the firm's profits and losses. Data from the Salvadoris' accounting books are reported in the figures in the Appendix. *Figures 1* and *2*, based on data from the books of shipments, show the yearly amount of silk exported and the final destination. *Figure 3*, based on the balance sheets of the throwing mills, traces the firm's economic performance through the return on sales of silk yarns, namely the ratio between the net profits and the turnover from the sale of silk yarns. To be noted is that the profits considered are only those gained on the sale of silk yarns, which have been calculated by comparing all the costs incurred in the manufacture of silk yarns with the corresponding revenues; hence they do not reflect the overall economic performance of the Salvadori firm, which also had further sources of revenue. The latter include profits earned from arbitrage on raw silk, set out in *Figure 4*, and drawn from the silk ledgers, which recorded the purchases of raw silk and their destinations. It is thus possible to calculate the portion of raw silk subjected to arbitrage, i.e. sold rather than processed in the Salvadoris' throwing mills, which is shown in *Figure 5*.

By providing direct evidence on the firm's strategies and performance, the Salvadori case can help us determine to what extent the changes in the economic and institutional environment actually altered the framework of opportunities for and constraints on business activities, and to what extent it was possible for the merchants to react to the crises that punctuated the period under investigation. It is worth noting that the concept of crisis used here does not entail *a priori* a negative assessment of the performance of the Tyrolean silk industry, and of the merchant-manufacturers who controlled it. Rather, in this specific context the term "crisis" denotes a sudden and sharp rupture in the industry's dynamics due to the advent of "exogenous shocks" which altered the way in which business activities were to be conducted. From this point of view, the Revolutionary-Napoleonic period was

9 On the Salvadori firm's operation in the seventeenth and eighteenth centuries, see Cinzia LORANDINI, Famiglia e impresa. I Salvadori di Trento nei secoli XVII e XVIII, Bologna 2006. On the key success factors of the firm in the long run, see Cinzia LORANDINI, Looking Beyond the Buddenbrooks Syndrome: The Salvadori Firm of Trento, 1660s-1880s, in: Business History, 2015 (*forthcoming*).

marked by a series of “shocks” which induced merchants to modify traditional strategies in order not to lose profitability and to mitigate the risk of failure.

The essay is organized as follows. The next section provides an overall description of the state of the silk industry in the Tyrolean region on the eve of the Revolutionary-Napoleonic era, while the following sections are devoted to analysis of specific phases within the period considered: the years from the French Revolution until the eve of Tyrol’s annexation to Bavaria (1789–1805); the Bavarian domination (1806–1809); and the period from annexation to the Kingdom of Italy to the return to Austria (1810–1813/15).[10] The last section draws some conclusions.

## 2. THE TYROLEAN SILK INDUSTRY IN THE LATE EIGHTEENTH CENTURY

During the eighteenth century, the manufacture of raw silk and silk yarns spread through northern Italy, being driven by growing demand from the textile manufacturers located beyond the Alps. In the southern part of historical Tyrol, dozens of firms built their fortunes on the silk trade, the most durable of them being the Salvadori firm, headquartered in the Prince-Bishopric of Trento.

The silk production process consisted of three major phases: sericulture, namely the production of cocoons, which entailed the cultivation of mulberries and the raising of silkworms; reeling, namely the extraction of raw silk by unwinding the thread from cocoons immersed in basins full of hot water; and throwing, namely the process of strengthening the silk in order to prepare it for weaving whereby two threads were joined and twisted together. This latter operation took place in water-powered throwing mills, whose output consisted of two main types of yarn: tram (used for weft, this yarn was made up of two threads twisted together) and organzine (of higher value, this was used for warp, and consisted of two threads twisted separately and then twisted again jointly).[11] The various phases of production were coordinated by the silk merchant-manufacturers, who also undertook sale of the silk on the international markets.

The silk industry was of especial importance for a number of reasons. First, it was a source of income for many people, such as the households engaged in the raising of silkworms, the workers employed in the reeling

[10] In late 1813 Austria regained control over Tyrol, which was formally annexed in 1815.

[11] On the technical aspects of silk production, see Richard L. HILLS, From Cocoon to Cloth. The Technology of Silk Production, in: Simonetta CAVACIOCCHI (ed.), La seta in Europa secc. XIII–XX. Atti della “Ventiquattresima Settimana di Studi” (Prato, 4–9 maggio 1992), Firenze 1993, pp. 59–90.

and throwing of silk, and the merchants engaged in trading activities. Furthermore, the silk trade was a key source of foreign exchange, which helped meet the needs of a fragile economy. Indeed, local agriculture was unable to provide all the foodstuffs necessary to satisfy the population's needs, so that constant imports were necessary to cope with the shortage of wheat. The consequent burden on the balance of payments could only be alleviated through the export of local products such as wine, timber, snuff, and most of all silk, while further revenues stemmed from transit trade and related activities.[12] Situated on a major transit route between northern Italy and central Europe, the Tyrolean region was constantly crossed by large flows of merchandise, which was transported by the river Adige to/from Bolzano/Bozen before/after crossing the Brenner Pass, the in- and outflow of goods being extensively supported by the Bolzano fairs which took place four times a year.[13]

All silk firms regularly attended the Bolzano fairs, which enabled merchants from both sides of the Alps to negotiate, trade and regulate payments, and profited from a special jurisdictional authority, namely a Merchant Court (*Magistrato mercantile*) dating back to the 1630s, which provided swift solutions to all controversies arising among the fairs' participants.[14] The prominence of the silk merchants within the regional economy and their international standing were such that in the second half of the eighteenth century they regularly had one or more representatives elected to the Merchant Court.[15] Among the merchants elected, the Salvadori stand out by frequency.

Actually, the Salvadori case is rather peculiar since, overall, the Bishopric's role in the manufacture and trade of silk was of minor importance if compared with the nearby Tyrolean district of Rovereto.[16] As for the differing magnitude of the silk business in Trento and Rovereto, suffice it to note that in the mid-eighteenth century there were only two water-powered throwing mills in the Bishopric's capital, added to which were two further mills driven by animals.[17] Hence, it is not surprising that much of the silk produced in the Bishopric was exported in the raw, often to the district of Rovereto. By contrast, the latter had 23 water-powered throwing mills in

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12 Andrea LEONARDI, L'economia di una regione alpina, Trento 1996, pp. 44–50.

13 Andrea BONOLDI / Markus A. DENZEL (eds.), Bozen im Messenetz Europas (17.–19. Jahrhundert)/Bolzano nel sistema fieristico europeo (secc. XVII–XIX), Bolzano 2007.

14 See the essay by Andrea Bonoldi in this volume.

15 Cinzia LORANDINI, Informazioni e istituzioni. Le basi di costruzione della fiducia nel commercio della seta trentino-tirolese tra Sei- e Settecento, in: Andrea BONOLDI / Andrea LEONARDI / Katia OCCHI (eds.), Interessi e regole. Operatori e istituzioni nel commercio transalpino in età moderna (secoli XVI–XIX), Bologna 2012, pp. 137–170, here p. 159.

16 Nicolò CRISTANI DE RALLO, Breve descrizione della Pretura di Rovereto (1766), ed. by Andrea LEONARDI, Rovereto 1988. The district of Rovereto, located south of the Bishopric, made up the southern Italian-speaking part of the county of Tyrol.

17 Archivio storico del Comune di Trento, ACT1-10109.

1740, which rose to 36 by 1766.[18] By then Rovereto had gained international renown for being specialized in the manufacture of high-quality silk yarns exported throughout Europe, and 23 merchant firms were operating in the business.[19]

Even though the Salvadori firm was not headquartered in Rovereto, it was by no means a minor one. In the period 1786–1788 the firm's proceeds from the sale of silk averaged 166,000 gulden,[20] which was equal to 5.5 per cent of the overall turnover of the district of Rovereto mentioned in a contemporary report.[21] If we consider that between 15 and 20 firms were operating in the district, the Salvadoris' turnover evidently approximated the average amount recorded by the Rovereto businesses. At that time, the Salvadori ran a silk-reeling mill in Trento and four throwing mills, one in Trento and three in Calliano, a village in the Bishopric on the road to Rovereto. The Salvadoris' mills had a substantial productive capacity. Indeed, since in 1766 and 1808 there were respectively 590 and 900 *valichi* in the district of Rovereto, while the Salvadori had 78 and 100 *valichi* in the same years, it can be argued that, throughout the period, the firm's productive capacity exceeded 10% of that available in Rovereto.[22]

In the late eighteenth century, ownership of the Salvadori business was in the hands of the third and fourth generations: the brothers Valentino (1752–1833) and Antonio (1754–1830), a priest, the brothers Giovanni Battista (1761–1825) and Francesco (1766–1824), and their uncles, Valentino (1736–1798), an abbot, and Carlo (1732–1802), who remained unmarried. Despite the joint ownership, the leadership of the firm was in the hands of Valentino jr., whose prestige and competence as a merchant is borne out by the fact that he was constantly elected to the Merchant Court of Bolzano from 1790 until 1808.[23]

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18 CRISTANI DE RALLO, Breve descrizione, pp. 78–79.

19 Ibid., pp. 41–42.

20 Calculations on data from the firm's journal: Archivio di Stato di Trento (henceforth: Ast), Archivio Salvadori (henceforth: As), vol. 922. The Salvadori archive is currently under rearrangement. The signatures used here are the older ones; however, a table of comparison will keep track of the correspondence with the new ones.

21 According to a report by Tyrol's governor, Wenzel Graf von Sauer, delivered in 1789, the manufacture and trade of silk in Tyrol produced a turnover of 3 million gulden. See Andrea LEONARDI, La struttura economica dell'area trentino-tirolese al tramonto dell'ancien régime, in: Marco BELLABARBA / Ellinor FOSTER / Hans HEISS / Andrea LEONARDI / Brigitte MAZOHL (eds.), Eliten in Tirol zwischen Ancien Régime und Vormärz / Le élites in *Thirolo* tra Antico Regime e Vormärz, Innsbruck / Wien / Bozen 2010, pp. 201–220, here pp. 205–206.

22 LORANDINI, Famiglia e impresa, pp. 246–247. The so-called *valichi* were the overlapped sections which made up a throwing machine.

23 Franz HUTER, Die Quellen des Meβgerichts-Privilegs der Erzherzogin Claudia für die Boznermärkte (1635), in: Bozner Jahrbuch für Geschichte, Kultur und Kunst, 1927, pp. 5–131, here pp. 93–112.

## 3. FROM REVOLUTION TO WAR: THE SALVADORI FIRM BETWEEN UPS AND DOWNS (1789–1805)

It was not until the late 1790s that the Tyrolean region was directly affected by the war campaign. However, the French revolution immediately brought about some indirect consequences on the Tyrolean silk industry. In the short run, the troubles of the French industry due to the revolutionary turmoil worked to the advantage of the German manufacturers,[24] and the Salvadori firm benefitted from it to a certain extent, inasmuch as it was able partially to offset the revolution's depressive impact on the price of silk. Owing to new investments, in 1789–1790 the production capacity of the Trento throwing mill increased threefold, although production levels were still less than half those in Calliano.[25] Moreover, the Salvadori also contracted out the manufacture of silk yarns to external producers, to whom they provided the raw silk. The firm's exports subsequently reached relatively high levels. In the period 1789–1792, annual shipments of silk averaged 74 quintals (Figure 1), 90% of which were processed in the Salvadoris' mills. The bulk of silk – between 55 and 58 per cent – was exported to Krefeld (Figure 2), where the Salvadori had their most important customer, the "Friedrich und Heinrich von der Leyen" firm.[26] The Salvadori firm consequently recorded a positive, albeit not extraordinary, performance (Figure 3).

The Revolutionary wars dealt a first severe blow to the business in the 1792/93 season, owing to the Rhine basin's involvement in the military operations. In autumn 1792 the French troops invaded the left bank of the Rhine, and in winter they occupied Krefeld, which suffered a severe liquidity crisis due to the imposition of a huge levy.[27] It is thus not surprising that in 1793 the Salvadoris' exports to Krefeld halved compared with the previous year. Although they were counterbalanced by a growth of exports to other localities, especially Zurich, the firm suffered losses in 1792/93 and performed poorly in 1793/94, while it operated particularly well in the following two seasons, when exports to Krefeld returned to their previous levels. The increased uncertainty also impacted on the organization of production. Indeed, the Salvadori ceased running their own reeling mill, and kept only the throwing machines in order to gain flexibility.

In 1796/97 and 1797/98 the firm again recorded a negative performance, which can be explained by a mixture of local and more distant

24 Hans POHL, Der deutsche Seidenhandel vom Mittelalter bis ins 20. Jahrhundert, in: CAVACIOCCHI, La seta in Europa, pp. 633–682, here p. 651.

25 LORANDINI, Famiglia e impresa, pp. 246, 330.

26 On the impressive growth of the von der Leyen firm during the eighteenth century, which was supported by the granting of exclusive privileges, see Helmuth CROON, von der Leyen, in: Neue deutsche Biographie, Vol. 14, Berlin 1985, pp. 432–433 (http://daten.digitale-sammlungen.de/bsb00016332/image_448, accessed 15 February 2014).

27 Timothy BLANNING, The French Revolution in Germany. Occupation and Resistance in the Rhineland 1792–1802, Oxford 1983, pp. 64, 150–151.

events. From 1796 onwards the Tyrolean region was recurrently subject to foreign occupation. However, equally if not more disturbing were some crucial events in the Rhineland which first halved and then almost cancelled the Salvadoris' exports to Krefeld.

This is not to deny the drawbacks of the passage of armies, which occurred three times in a matter of five years: a first occupation by the French troops took place from September to November 1796, a second one from January to April 1797, and a third in the first quarter of 1801. Afterwards, the county of Tyrol returned under the Habsburg's sovereignty, whereas the Bishopric of Trento benefitted from a short period of autonomy before being annexed, in 1803, to the Austrian province of Tyrol.[28] Evidence drawn from the Salvadori accounting books shows that only the former two foreign occupations coincided with a negative economic performance, whereas the latter was only reflected in a reduction of shipments. Military operations totally blocked the traffic of goods across Tyrol for entire months. The firm's shipping ledgers do not contain any records from August to October 1796, whereas only one shipment was made in each of the following three months. In February and March 1797, shipments were again suspended.[29] Whilst, overall, exports were not substantially reduced in 1796, they fell sharply in 1797, and plummeted in the following year.

Since at that time there was no longer any local warfare, a proper explanation of the firm's performance evidently requires consideration of more distant events. Indeed, in 1798, the left bank of the Rhine was integrated into the French economic system, which blocked all commercial flows between the areas on two sides of the river. Whilst after the French occupation trading conditions had remained difficult, but not prohibitive – thus allowing the partial resumption of production – the transfer of the customs frontier to the Rhine caused a lasting decline.[30] The von der Leyen firm itself, the largest business in Rhineland at that time, suffered severely, in that it operated at a loss after 1797.[31] This explains the collapse of the Salvadoris' shipments to Krefeld. Furthermore, in the same period exports to Zurich and Elberfeld were also dramatically reduced, if not levelled out.[32] More precisely, shipments to Zurich almost ceased from 1796 until

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28 Since March 1801 until November 1802 the Bishopric was governed by the chapter of the cathedral. On the vicissitudes of the Prince-Bishopric in that period, see Mauro NEQUIRITO, Il tramonto del Principato vescovile di Trento: vicende politiche e conflitti istituzionali, Trento 1996.

29 See the book of shipments in Ast, As, vol. 699.

30 BLANNING, The French Revolution in Germany, p. 151.

31 Michael ROWE, From Reich to State. The Rhineland in the Revolutionary Age, 1780–1830, Cambridge 2003, p. 56. Though the firm slowly recovered after 1806, the loss of its monopoly in Krefeld forced the von der Leyen to face competition from new textile manufacturers within the city (ibid., pp. 205–206).

32 Elberfeld was a major silk destination in north-western Germany, in the Wupper Valley. On the rise of silk manufacturing in Elberfeld and Barmen (now Wuppertal), see Joachim KERMANN, Between Centralization and Decentralization. The Silk Industry

1799, which was probably initially due to the frequent impediments brought about by the local warfare. Later, the 1798 invasion of Switzerland by the French troops further hindered the resumption of exports to that market.[33]

Despite a partial recovery at the beginning of the nineteenth century, the Salvadoris' exports to Krefeld remained far below their earlier levels. However, the overall downward trend of shipments had already gone into reverse in 1799 thanks to the recovery of exports to Vienna and, most of all, to the firm's entry into the London market. In that year, 46% of shipments had London as their final destination, while a further 15% were destined for Hamburg, and thus were probably shipped to England.[34] This is a clear instance of how the warfare created artificial obstacles to trade, thus inducing merchants to abandon traditional markets and to explore new commercial routes. This time, the Salvadori were able to change their business strategy successfully, which was reflected in a substantial improvement in the firm's economic performance.

After a peak in 1799–1800, when shipments averaged 83 quintals per year, in the period 1801–1804 the amounts shipped diminished on average to 63 quintals per year. Silk was quite evenly distributed among the different outlet markets, the most important ones being Vienna and London, followed by Zurich and Krefeld. As for economic performance, the firm did well, even though profits significantly declined in 1802/03. In that year, about 4,400 gulden of losses were recorded in the firm's balance sheet as a consequence of the bankruptcy of a London merchant, Peter Le Souef, though this provides a very partial explanation for the worsening performance.[35] The decline in the profits earned from the sale of silk yarns was partially offset in 1803 by greater recourse to arbitrage on raw silk. From that year onwards, indeed, besides shipping silk to London on their own account, the Salvadori engaged in arbitrage through a partnership with the firm "Ustery & Co." of Zurich aimed at selling raw silk in joint account on the Swiss market.[36] As a consequence, the share of exported silk yarns in the overall shipments declined, and over one quarter of the raw silk purchased by the Salvadori was directly sold, instead of being processed in the throwing mills. The portion of raw silk subjected to arbitrage increased to

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in the Rhineland in the 18th Century and in the Early 19th, in: CAVACIOCCHI, La seta in Europa, pp. 325–334, here pp. 330–331.

33 See the essay by Marie-Claude Schöpfer in this volume.

34 Following the French occupation of Habsburg Belgium and Holland, and the subsequent unavailability of the port of Ostend for shipments to London, this latter was replaced by Hamburg. See Angelo MOIOLI, Aspetti della produzione e del commercio della seta nello Stato di Milano durante la seconda metà del Settecento, in: Aldo DE MADDALENA / Ettore ROTELLI / Gennaro BARBARISI (eds.), Economia, istituzioni, cultura in Lombardia nell'età di Maria Teresa, Vol. I, Economia e società, Bologna 1982, pp. 151–173, here p. 167.

35 The "Peter le Souf" firm of London went bankrupt in 1797–1798, but the bankruptcy procedure ended in 1803. See the 1802/03 balance sheet in: Ast, As, vol. 1172.

36 Data concerning the arbitrage on raw silk conducted with Ustery & Co. are recorded in Ast, As, vol. 1015.

one half in 1805 (Figure 5). In that year, however, both areas of business – the sale of raw and thrown silk – operated at a loss. This time, as reported in the balance sheet drawn up in 1805, the firm's losses were due to the monetary disorders afflicting the Austrian economy; and the same was to occur in the following year. Indeed, the Austrian government had issued large amounts of paper money, the so called *Wiener Bancozettel*, to finance the war. This contributed to pumping an inflationary spiral, and led to the rapid devaluation of the *Bancozettel,* which eventually lost 40% of its value.[37]

Overall, in the period examined the Salvadori firm does not seem to have suffered so severely from the Revolutionary-Napoleonic wars and the ensuing policies of economic warfare. Certainly, the business performance oscillated; nonetheless, the losses suffered in some years were more than offset by high profits in others. Similarly, the silk trade in Rovereto thus far did not seem to have undergone a retrenchment, if one can trust the information according to which on the eve of the Bavarian domination there were still 20 silk merchants and 47 throwing mills operating in the town.[38] The Salvadoris' accounts, however, show that after 1796 the contracting-out of the manufacture of silk yarns was suspended, and that capacity utilization in the firm's throwing mills was substantially reduced. While the production of silk yarns averaged around 70 quintals in the earlier period, it then fell, and remained almost constantly below 50 quintals. It was not until 1812 that the output of the Salvadoris' throwing mills again approximated the levels of the early 1790s.[39] By contrast, the focus on raw silk purchased from external producers grew stronger.

## 4. UNDER THE BAVARIAN KINGDOM: THE APEX OF THE CRISIS (1806–1809)

The firm's business fortunes underwent a dramatic reversal in the following years, when Tyrol was subject to the Bavarian domination. In September 1805, Napoleon's declaration of war on Austria started the military campaign against the third coalition, which ended in December with the Austrian defeat and the signing of the Treaty of Pressburg. This latter sanctioned the transfer of Tyrol to France's ally, Bavaria, which was to govern the region until the Tyrolean uprising of 1809.

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37 The inflationary spiral cannot be entirely attributed to the money supply. Inflation had gained strength in Tyrol since 1796, due to the pressure of military demand in a region that was highly dependent on the neighbouring areas for the import of foodstuffs. See LEONARDI, La struttura economica, p. 208.

38 Wolfgang MEIXNER, Handwerk und Gewerbe bis 1811, in: Chronik der Tiroler Wirtschaft mit Sonderteil Südtirol, Wien [1991], pp. 156–176, here p. 162.

39 Calculations on data from the ledgers of the throwing mills in Trento and Calliano: Ast, As, vols. 118, 1069, 1172.

The Bavarian period is well known for the introduction of reforms regarded by economic historians as important steps toward the modernization of the local economy, because they dismantled a number of residues of the old regime. For instance, the removal of private tolls and duties, and the abolition of privileges enjoyed by local forwarding companies, helped reduce the costs incurred in the transfer of goods. However, the Bavarian authorities also undertook some extremely unpopular measures, such as increased taxation and the introduction of military conscription, which provoked the Tyrolean revolt. Moreover, the deflationary monetary policy and the alignment to French trade policy in the aftermath of the Continental blockade could hardly prove favourable for the activities of merchants, who repeatedly complained to the authorities about the many obstacles to trade.

One of the first interventions of the Bavarian authorities concerned monetary matters, and was aimed to stop the disorders caused by the excessive circulation of Austrian paper money. The deflationary measures introduced by the Bavarian government caused huge difficulties for the silk industry. The withdrawal of the Austrian paper money was a matter of deep concern among merchants who – though they acknowledged the need to restore stable monetary conditions – feared the foreseeable impact on the local economy of a sharp reduction of liquidity.[40] In fact, the return to a metallic currency caused a sharp fall in prices, and the rise of defaults among debtors,[41] though evidence from the Salvadoris' accounting books shows that the impact of monetary disorders had already been reflected in the firm's economic performance at least one year before. The most serious losses, however, were recorded in 1806 when, again, the devaluation of the *Bancozettel* was deemed responsible for them.

The troubles of the silk industry were exacerbated by the trade policy. Tyrol's integration into the Bavarian tariff system entailed separation from the Austrian territories, and thus from the Veneto region – a major producer of silk – which had been incorporated into the Habsburg Monarchy at the end of the war of the first coalition, under the terms of the 1797 Treaty of Campo Formio.[42] The Tyrolean silk merchants, instead of benefitting from the new trade barrier with Veneto, complained about the loss of competitiveness against their "Italian" rivals on the German markets. The reason, as pointed out in a report in 1808, was that the merchants of Rovereto needed to import lower-quality raw silk from Veneto in order to manufacture trams, which were exported along with the organzines manufactured from the

40 Andrea BONOLDI, Tra Stato e mercato. Commercio e istituzioni nel Tirolo meridionale in età napoleonica, in: BELLABARBA ET AL., Eliten in Tirol, pp. 221–237, here p. 226.

41 LEONARDI, La struttura economica, pp. 208–209. See also the concerns expressed by the Salvadori to their trusted correspondents: Ast, As, vol. 20, pp. 733–735, Letters to Biolley of Augsburg, 16 and 25 March 1806.

42 The Habsburg Monarchy acquired the territories of the former Republic of Venice which were located east of the Adige River. Austria, in its turn, formally acknowledged the Cisalpine Republic – renamed Italian Republic in 1802, and Kingdom of Italy in 1805 – which embraced the area to the west and south of the river.

higher-quality local silk. Thus, since the Kingdom of Italy – which now included Veneto – applied high duties on the export of raw silk, the Tyrolean merchants became less competitive than the "Italian" ones on the foreign markets. At the same time, the duty charged on the Italian silk yarns that passed through the Tyrolean territory was not considered a sufficiently protective measure, since the Italian products could access the German markets via alternative routes.[43] As a consequence, the export outlook for the local silk was deemed critical.

But what is the evidence from the Salvadori case? Actually, although the firm's ledgers show that shipments to Vienna dropped to less than half in 1806, the total amount of exports not only increased, but remained over 75 quintals in the following two years. It must be noted, however, that the Salvadori firm mostly focused on the trade of organzines, which was paralleled by the arbitrage on locally produced raw silk. Hence, the firm was far less affected by the new tariff system than the Rovereto merchants. On the other hand, the partnership with Ustery & Co. of Zurich helped sustain the level of shipments, especially after the loss of the London market due to the Continental Blockade. As a consequence, Zurich became the most important marketplace for the Salvadori firm, absorbing almost 40% of shipments in the period 1805–1808. At the same time, the recovery of exports to Krefeld and Elberfeld enabled the firm to counterbalance the fall of shipments to Austria. In this regard, it must be acknowledged that the Salvadori did not remain idle. Indeed, the strengthening of commercial relationships with Krefeld and Elberfeld, which accounted for 40% of the firm's shipments in 1807 and 1808, followed a journey by Valentino's son, Isidoro (1783–1848), then 23 years old, who traveled through the German territories via Frankfurt and Elberfeld, eventually reaching Paris.[44]

This happened in the spring of 1806, a few months before issue of the Berlin Decree (21 November 1806) which sanctioned the introduction of the Continental Blockade with the outright ban on introducing British goods into the French satellites. The consequent interruption of trade with Britain was reflected in the Salvadoris' loss of the London market. Moreover, enforcement of the new measures required that all merchandise be accompanied by a certificate of origin, which made the shipping procedures more complex. Also to be noted is that the interruption of correspondence with England hampered the collection of payments by the merchants who had shipped goods there – among them the Salvadori and many other Tyrolean

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43 See the report "Notizie intorno allo stato attuale del commercio e prodotto di sete in Rovereto, 1808", published in: CRISTANI DE RALLO, Breve descrizione, pp. 81–83. As a solution, the local merchant élite suggested the drawing up of a commercial treaty between Bavaria and the Kingdom of Italy; after lengthy negotiations, the treaty was signed in January 1808, but ultimately it was not enforced. See BONOLDI, Tra Stato e mercato, pp. 227–228.

44 See the firm's journal in: Ast, As, vol. 919, 5 April 1806; 29 April 1806; 26 June 1806.

silk merchants – thus exacerbating the liquidity problem engendered by the Bavarian monetary policy.

The Salvadori case also provides evidence on the increase in the fiscal pressure which exacerbated the merchants' hostility towards the Bavarian regime. Especially hated was the introduction of the *testatico* (*Kopfsteuer)*, which accompanied other burdens, such as forced loans and contributions, imposed by the government to cover war expenditure and to provide for the maintenance of the occupation troops. Since the outbreak of the Napoleonic wars, the merchants had often been subjected to impositions of this type;[45] nevertheless, they substantially increased under the Bavarian domination. In 1807, the Salvadori themselves complained to the authorities about the review of the *testatico*, which would have subjected their family to a heavy burden.[46] The Salvadori maintained that the firm's turnover had been overestimated, and listed four major problems from which the silk trade suffered: frequent bankruptcies; the lack of demand and the related price fall; the long-term exposure to customers, and currency losses. In particular, the Salvadori pointed out that the monetary vicissitudes had caused huge losses by the firm in the last two years. They argued that only through compassion for the many people who would otherwise have lost their means of subsistence had they decided to continue the business.[47] In fact, the throwing mills were still working, but in recent years the production levels had remained steadily below 50 quintals. With regard to the dynamics of the whole sector, some official reports stated that by 1811 the labour employed in the reeling of silk had declined by more than one fifth compared with 1806, whereas the workforce in the throwing mills had shrunk by 40 per cent in the same period. However, still to be determined is the extent to which the decline was due to the Bavarian domination rather than to the period when Tyrol was annexed to the Kingdom of Italy.[48]

In 1809, faced with a forced loan imposed by the Committee for subsistence (*Comitato delle sussistenze*), the Salvadori disbursed about 10,000 gulden, which not only included their own share, but also a substantial amount paid on behalf of other families who temporarily lacked the necessary liquidity. The Salvadori consequently asked to be exempted from further impositions in order not to endanger prosecution of the business, which

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45 In 1797, the urban government in Trento established the collection of 12,000 gulden on all trade and manufacturing activities located in the district, which provoked protests by the operators about the supposedly unequal distribution of the burden: Ast, As, sc. 96, b. 32, Supplica dei deputati dal Congresso mercantile di Trento all'eccelso i.r. Consiglio amministrativo […], 31 August 1797.

46 According to the new ranking, the Salvadori were taxed as if they earned an income of 30,000 to 40,000 gulden. However, they complained that the authorities had not considered the fact that the firm was owned by four people belonging to two distinct families: Ast, As, sc. 54, b. 14.

47 Ibid.

48 The reports were delivered by the *Dipartimento dell'Alto Adige* – which included the Tyrolean territories annexed to the Kingdom of Italy – to the Ministry of the Interior in Milan: LEONARDI, La struttura economica, p. 220.

had difficulties in collecting payments locally, and especially abroad, due to the interruption of communications.[49] Nevertheless, the Bavarian domination was coming to an end. In the same year, the advent of forced conscription heightened the discontent among the Tyrolean people, and ultimately led to a popular insurrection. The Tyrolean uprising, which was supported by the Austrian armies, caused great turbulence in the region, which explains the drop in the Salvadoris' shipments of silk, 60% of which was sent to the Ustery of Zurich. For a few months, Tyrol was subjected to a provisional government and, in the end, the insurrection was suppressed by the French armies. The Treaty of Schönbrunn, signed in October 1809 between France and Austria, envisaged a new destiny for the Tyrolean territory, thus again changing the institutional framework in which the silk industry operated.

## 5. FROM THE KINGDOM OF ITALY TO THE RETURN TO AUSTRIA: STRATEGIES FOR EXPANSION (1810–1815)

There followed a division of Tyrol into two parts which was to last until 1813: the area north of Bolzano remained part of the Kingdom of Bavaria, whereas the southern portion of the region – including Bolzano, Trento and Rovereto – was annexed to the Napoleonic Kingdom of Italy, with the consequent transfer of sovereignty from Munich to Milan.[50] The territories assigned to the Kingdom of Italy were to be organized into a Department called *Dipartimento dell'Alto Adige*, and a provisional administrative commission was established to this end. The new Department was eventually divided into five districts corresponding to a prefecture in Trento and four sub-prefectures. The prefect was the highest authority, and he was supported by a council with thirty members, who were chosen provided they had a certain ability to pay (*capacità contributiva*).[51] The blood nobility – to which the old regime assigned the privilege of government – was thus replaced by a sort of "financial aristocracy", although there was no abrupt shift, since the two often coincided.[52] The right to vote was exercised by three constituencies, made up respectively of landowners, learned people (*dotti*), and merchants, and it is interesting to note that the list of merchants entitled to vote was composed of 22 members, with Valentino Salvadori

49 Ast, As, sc. 54, b. 17.

50 With the Peace of Schönbrunn (14 October 1809), which ended the war of the fifth coalition, Tyrol was transferred to France; then the Treaty of Paris (28 February 1810) between France and Bavaria sanctioned the division of the territory between the two allies.

51 Mauro NEQUIRITO, Le istituzioni roveretane dall'invasione napoleonica alla Restaurazione, in: Mario ALLEGRI (ed), Rovereto, il Tirolo, l'Italia. Dall'invasione napoleonica alla belle époque, Vol. I, Rovereto 2001, pp. 63–98, here pp. 84-85.

52 Ibid., pp. 86-87.

ranking second with total assets (*facoltà*) amounting to 400,000 gulden. The wealthiest merchant was Florian Putzer from Bolzano with 600,000 gulden, whereas the other merchants' assets did not exceed 200,000 gulden.[53]

Following annexation to the Kingdom of Italy, the southern part of Tyrol was commercially integrated with the other Italian departments belonging to the French satellite, whereas trade with the northern territories, and especially with the Habsburg Empire, was subjected to the institutional constraints imposed by the French tariff system.[54] With regard to the silk trade, the Salvadori shipping books provide evidence on the great uncertainty which persisted throughout 1810, when several bales of silk were shipped to the forwarding agents with the warning to wait for further instructions before sending them to the final customers. However, to a certain extent, things seemed to get better. The Bolzano fair of March 1810 was defined "good" by the chancellor of the Merchant Court compared with the previous three years; nevertheless, the chancellor argued that this success was partially due to the debacle of the fairs in 1809, and that the fair's outcome was still far less satisfactory than in the pre-Bavarian period.[55]

According to the estimates reported in an official description of the *Dipartimento dell'Alto Adige* in 1810, silk exports amounted to about 156,000 Vienna pounds, namely 874 quintals, which – considering the average shipments of the Salvadori firm in the previous five years – means that the Salvadori exported about 8% of the overall amount.[56] Assuming that the statistical data are reliable, this suggests that the position of the Salvadori firm had somewhat improved.[57] Moreover, the firm's shipments were to grow substantially in the following years (Figure 1).

For explanation of this, account must be taken of a major change in the business strategies which had occurred in 1809, when, evidently disappointed by the unsatisfactory performance of the previous years, the Salvadori decided for the first time to involve a non-kin partner in the family business. Hence, they established a partnership with Giuseppe Rungg – the former di-

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53 Pietro PEDROTTI, L'attività pubblica del Barone Sigismondo Moll durante il primo regno d'Italia, in: Studi trentini di scienze storiche 17/2, 1936, pp. 65–99, here pp. 86, 99. On Putzer, see the essay by Bonoldi in this volume.

54 It is thus not surprising that the Salvadoris' shipments to Vienna – which had already been substantially reduced in the previous years – remained at a very low level.

55 Thomas ALBRICH / Stefano BARBACETTO / Andrea BONOLDI / Wolfgang MEIXNER / Gerhard SIEGL (eds.), Stimmungs- und Administrationsberichte aus Tirol 1806–1823 / Stati d'animo e situazione amministrativa in Tirolo: relazioni 1806–1823, Innsbruck 2012, p. 175.

56 The report mentioned as market outlets Switzerland, the states of the Rhenish Confederation, Leipzig, Hamburg, Russia, and Vienna: ibid., p. 157.

57 Other sources evidence that the Salvadori controlled 6% of the silk trade in 1808. This can be inferred by comparing the amount of silk produced in southern Tyrol, which totaled 237,250 Vienna pounds in 1808, and the silk shipped by the Salvadori in the same year, which amounted to almost 15,000 Vienna pounds. Data from "Notizie intorno allo stato attuale del commercio", p. 81, and calculations on shipping data from Ast, As, vol. 670.

rector of Ustery & Co. from Zurich – which started in 1810, and was to last until 1826. All four members of the fourth generation participated in the company, but from the distribution of profits it is clear that Rungg undertook the bulk of the managerial activities. Indeed, the new partner provided a minor capital share, but he was entitled nevertheless to one third of the profits.[58]

The association with Rungg certainly helped the Salvadori ride out those troubled times, though it could not withstand the negative conjuncture of 1810/11. This is by no means surprising if one considers that several countries were struck by a severe crisis at that time, among them Prussia and Switzerland.[59] Though many factors contributed to the crisis, the traditional explanations point to the strengthening of the Continental Blockade in 1810, which is held responsible for the ensuing financial and commercial collapse. Indeed, the economic downturn coincided with Napoleon's Fontainebleu decree (18 October 1810) instituting the so-called "customs terror".[60] Thus, after the Salvadori firm had recorded a more than satisfactory performance in terms of exports and profitability, conditions took a turn for the worse between 1810 and 1811. In 1811, the return on sales of silk yarns turned negative (Figure 3), while shipments fell by one fourth compared with the previous year.

By contrast, the following season marked the start of a new recovery both in sales and profits which can be traced back to growing exports to Krefeld and Elberfeld-Barmen, and the resumption of shipments to London, followed in 1813 by a temporary revival of the Austrian market. In particular, from 1812 onwards Elberfeld-Barmen became the most important destination for the Salvadoris' silk, thus replacing Zurich as a major marketplace. As for the exports to England, these were probably undertaken under Napoleon's licence system, which had been introduced in the summer of 1810, only to be extended to silk in December 1811.[61]

Hence, the Salvadori case shows a better picture than that depicted in a report drawn up in August 1812 by Pietro Perolari Malmignati, the deputy prefect of the district of Rovereto. This latter compiled a statistical description of the territory under his supervision, on the basis of which one can gain insights into the state of manufacture and trade;[62] a kind of inquiry that

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58 The remaining profits were to be distributed among the members of the Salvadori family according to their capital. It is interesting to note that profits were calculated after deducting a 5-per cent interest on the partners' funds. See the partnership agreement in Ast, As, sc. 67, b. 24.

59 HECKSCHER, The Continental System, III.V.2.

60 ROWE, From Reich to State, pp. 205–206. As Heckscher puts it, the connexion with the Continental System is manifest because "the Trianon and Fontainebleau policy practically had the effect, at least for the moment, of making things more difficult by the stricter control than of making them easier by the fiscal customs and licensing system": HECKSCHER, The Continental System, III.V.9.

61 PILLEPICH, Milan capitale napoléonienne, pp. 598–599.

62 Biblioteca comunale di Trento, ms. 301, Rapporto statistico del Distretto di Roveredo esteso dall'assistente al Consiglio di Stato vice prefetto di Roveredo Pietro Perolari

was all the more welcome to the Italian government, which knew little about the features of the newly-acquired Department. The report stressed the huge dependence of the district of Rovereto on foreign trade, which was traditionally undertaken to a large extent with non-Italian regions, especially Germany and England, where the bulk of local produce was exported. Hence, Perolari Malmignati maintained that the interruption of foreign relations and the diversion of trade flows to the Kingdom of Italy could not but prove detrimental to Tyrol, whose products could hardly compete with those produced in other departments. In particular, the manufacture of silk was at a critical juncture because, while the English market had been lost, the domestic market was oversupplied. The silk output of other Italian cities largely exceeded the internal demand, and the production of Rovereto could hardly compete with it; though of superior quality compared to the Veneto silk, it was much more expensive because of higher labour costs. Of 41 silk mills situated in the district of Rovereto, the vice prefect reported that four of them had closed, and many others were not working full-time.[63] Hence, while in the Bavarian period the Tyrolean merchants had asked that the import of raw silk from Veneto be favoured, now they complained about competition by the Veneto silk. Similar concerns had been raised by an earlier report with regard to competition by Lombard silk, namely from Milan and Brescia. It was argued, in this case, that the enforcement of the same export duty put the Tyrolean silk at a disadvantage, since the Lombard silk was more competitive owing to its higher quality.[64]

But what about the effect of the French demand which, as scholars argue, would have boosted the manufacture of silk in the northern Italian regions? In this regard, the new political setting probably affected the various producing areas differently, and it is likely that Tyrol was comparatively at a disadvantage. Both for geographical reasons and because of the types of silk yarn manufactured, the north-western producing areas, especially Piedmont, had stronger links with the French market, while the eastern regions traditionally addressed the bulk of their production to the Swiss, German and Austrian markets.[65] Although in August-September 1810 exports of silk from the Kingdom of Italy to France, and hence to Lyon, were exempted from any duties,[66] this was not enough to make the French market attractive to the Tyrolean merchants, as evidenced by the Salvadori case.

Malmignati l'anno 1812. The report, which was intended for the Minister of the Interior Luigi Vaccari, was prepared after two years of documentation.

63 According to a different source, 12 throwing mills stopped working in Rovereto between 1810 and 1812. See Robertino GHIRINGHELLI, La lavorazione della seta nel Roveretano nell'età della Restaurazione. Vicende ed aspetti, in: Atti della Accademia Roveretana degli Agiati 234, 1984, f. A, pp. 189–239, here p. 197.

64 ALBRICH ET AL., Stimmungs- und Administrationsberichte, p. 157.

65 While the textile businesses in Krefeld and Zurich focused mainly on the manufacture of lightweight silk fabrics and ribbons, Lyon was mostly specialized in heavy and expensive fabrics. See POHL, Der deutsche Seidenhandel, p. 648.

66 PILLEPICH, Milan capitale napoléonienne, pp. 595–597.

Indeed, although the Salvadori firm sent some bales of silk to Lyon in the autumn of 1810, there were no further shipments, and the firm continued to rely on its traditional outlet markets. Yet well before the return to Austria in the late 1813, following the recovery of the German markets, the firm's performance with regard to both shipments and profitability became extremely positive (Figures 1 and 3), and the Salvadori strongly reduced the arbitrage on raw silk while focusing again on the manufacture and sale of silk yarns (Figure 5). To this end, not only did they increase the centralized manufacture of silk yarns in their own mills, but they also resorted more than ever to the contracting-out of throwing, with silk yarns processed by external producers amounting to one fifth of the overall amount in 1813, and to more than one third in 1814.[67]

## 6. CONCLUSION

The Revolutionary-Napoleonic wars are well-known for having severely disrupted trade by introducing new artificial obstacles and increasing the uncertainty and risks of business activities. Merchants had to change their strategies and commercial routes, while facing further problems caused by monetary disorders and growing fiscal pressure. Some businesses survived through those troubled times, others did not and fell into bankruptcy. The Salvadori case is evidently a success story inasmuch they were able not only to pass through the Revolutionary-Napoleonic period but they even performed, in several years, particularly well. Amidst high market uncertainties, they endeavoured to gain greater flexibility in the organization of production by resorting to a mixture of centralized manufacturing in their own throwing mills, the purchase of raw silk from a number of local producers (*Kaufsystem*), and the contracting-out of the processing of silk yarns to external producers (*Verlagssystem* or putting-out system). The extent to which the firm engaged in the arbitrage of raw silk also changed through time, and it was related to the distribution of market outlets. In this regard, the ability to off-set the loss of important markets by relying more on other destinations, or by exploring new ones, owed much to the Salvadoris' integration into an extensive network of correspondents who provided reliable information about potential customers. The association with a non-kin partner endowed with expertise in the silk business and deep knowledge of the Swiss and German markets, proved particularly useful and boosted the firm's activities, while the involvement in the business of different branches

67 Calculations on data from the ledger of the throwing mill in Trento: Ast, As, vol. 1172. In 1812 the Salvadori established commercial relationships with a firm at Bassano (Veneto), to which they supplied large quantities of raw silk to be processed into silk yarns.

of the family ensured the availability of risk capital which exempted the firm from creditors' pressures.

To be sure, the firm's performance varied during the Revolutionary-Napoleonic period. In the first fifteen years, the firm did not seem to suffer so severely, with the losses recorded in some years being more than offset by high profits in others. The most disappointing performance was recorded under the Bavarian domination, and it was mainly due to liquidity constraints determined by a mixture of factors, including the Bavarian deflationary policy. Nonetheless, it must be acknowledged that the monetary chaos caused by the excessive circulation of the Austrian paper money had already impacted on the firm's balance sheets at least one year before. By contrast, due to the Salvadoris' successful strategies, the transfer to the Kingdom of Italy heralded a recovery, though it was halted by the 1810/11 crisis.

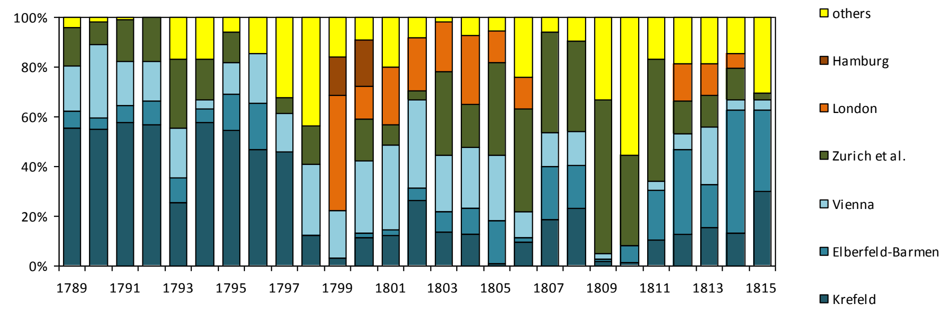
The Salvadori case demonstrates how merchants were able to adapt to changes in government and to shifting trade policies. Far from being merely a result of the immediate legal framework, the merchants' performance depended on a combination of local and more distant events, and on the extent to which businesses were able to draw on their internal resources and external skills to overcome the constraints and exploit the new opportunities opened up by economic and institutional changes.

## *Appendix*

*Figure 1: Shipments of silk, 1789–1815 (quintals, net weight)*

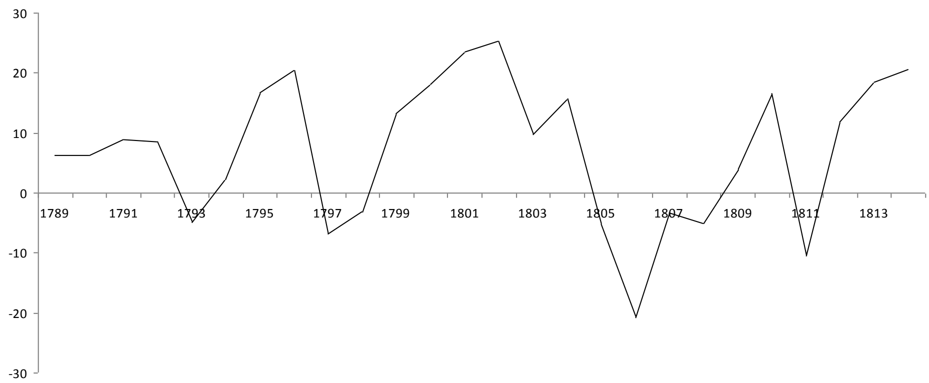

Note: Calculations on shipping data from Ast, As, vols. 699, 670, 1212. The graph only reports shipments of raw silk and silk yarns, excluding the waste from reeling and throwing.

*Figure 2: Shipments of silk: destinations, 1789–1815 (%)*



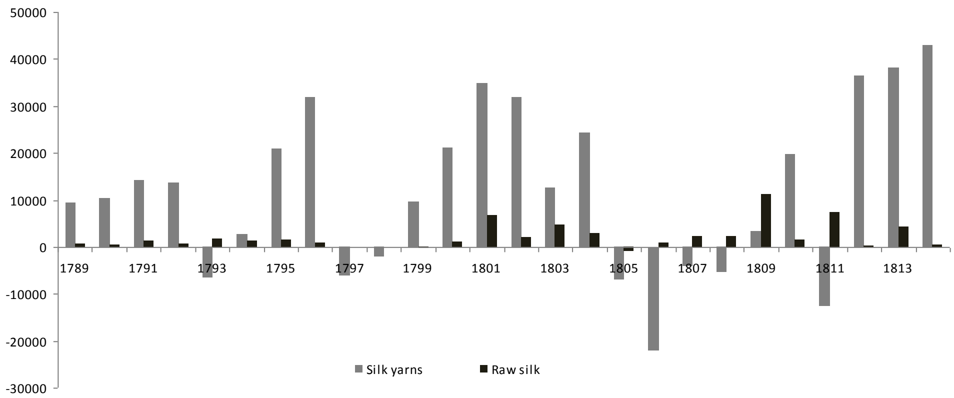

Note: Calculations on shipping data from Ast, As, vols. 699, 670, 1212. Zurich et al. also includes Basel, Balgrist and Aarau, but shipments were limited to Zurich until 1810.

*Figure 3: Return on sales of silk yarns, 1789–1814 (%)*




Note: Calculations on data from the ledgers of the throwing mills in: Ast, As, vols. 118, 1069, 1172. Years shown are those when the balance was struck; for instance, the rate reported for 1789 refers to the 1788/89 silk season, which started in May-June 1788.

*Figure 4: Profits and losses from the sale of silk yarns, and from arbitrage on raw silk, 1789–1813 (gulden)*




Note: Calculations on data from the ledgers of the throwing mills and the silk ledgers in: Ast, As, vols. 118, 1069, 1172, 1015, 1214. Profits and losses from arbitrage on raw silk refer to the calendar year, whereas the data on the sale of silk yarns refer to the last silk season.

*Figure 5: Arbitrage on raw silk, 1789–1815 (% on total purchases of raw silk)*


Note: Calculations on data from the silk ledgers in: Ast, As, vols. 1015, 1214.