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Merchants, Proto-Firms, and the German Industrialization: the commercial determinants of nineteenth century town growth

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Merchants, Proto-Firms, and the German Industrialization: the commercial determinants of nineteenth century town growth

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Abstract

The role of merchants in shaping the German industrialization is often acknowledged, yet scarcely researched. A small number of case-studies of merchant families and individual towns have shown the significance of merchants as capital providers, industrial entrepreneurs, and political actors, yet no supra-local study into the wider significance of this social group for the German economy exists. This dissertation introduces a new source, a business directory from 1798, to construct micro-data on 6099 individual merchant and manufacturing enterprises across 56 towns in Germany. The resulting dataset is the earliest supra-regional evidence on the spatial variation of urban merchant communities in Germany to date. Furthermore, this paper provides a detailed overview of the types of eighteenth-century merchants and analyses under what exact circumstances merchants became industrial entrepreneurs. Using multivariate OLS regressions, it finds a strong association between a greater share of proto-firms in a town in 1798 and its growth rates across the nineteenth century. The findings point to a hitherto overlooked link between the qualitative structure of late eighteenth century merchant activity, the elasticity of supply of early industrial entrepreneurship, and the spatial variation of urban growth experiences in nineteenth century Germany.[1]

Introduction

The merchant may be the most intriguing yet under-researched member of the cast that constituted Germany's industrialization experience.[2] Existing research has often implicitly limited his role to that of the accumulator of the necessary capital for the factory industrialization. However, this woefully overlooks the crucial function of merchants as entrepreneurs, particularly in the early stages of the industrialization. While a significant number of scholars have acknowledged

[1] I want to thank Max-Stephan Schulze, for excellent and enthusiastic supervision, Jeremiah Dittmar, for generously sharing his Städtebuch population data with me, and Karolina Hutkova, for a helpful discussion.

[2] This paper utilizes the anachronistic term 'Germany' to refer to the geographic unit which was part of the first unified German state plus the city of Basel.

this role, few, if any, have been concerned with the precise mechanisms of continuity between merchants and industrialists, and the wider economic consequences of differences in the quantity and quality of merchant groups across space. A number of case-studies of merchant families and individual towns have shown the significance of merchants as capital providers, industrial entrepreneurs, and political actors, yet no supra-local study into the wider significance of this social group for the German economy exists.[3] This paper seeks to address this appalling neglect of the merchant in the current historiography of late eighteenth and nineteenth century Germany, both from a conceptual and an empirical perspective.

The general 'paucity of evidence on the pre-1840 period' has, inter alia, held back quantitative research into the role of merchants and early entrepreneurs in German history.[4] Contemporary trade statistics for the 18th century are virtually non-existent with some 'rare exceptions' existing in the form of 'aggregate figures for Bavaria and a database of individual import declarations in Hamburg'.[5] Even when data sources on commerce become available, as in Saxony in the 1830s, they remain highly fragmentary and are considered 'entirely unreliable'.[6] This absence

[3] Such case studies include: Stefan Gorißen, *Vom Handelshaus zum Unternehmen: Sozialgeschichte der Firma Harkort im Zeitalter der Protoindustrie (1720-1820)*, Bürgertum - Beiträge zur europäischen Gesellschaftsgeschichte (Göttingen: Vandenhoeck & Ruprecht, 2002); Hans-Werner Niemann, 'Kontinuitätssicherung durch Transformation. Die Entwicklung des Bramscher Familienunternehmens Sanders vom protoindustriellen Leinenhandel zur industriellen Weberei', *Zeitschrift für Unternehmensgeschichte / Journal of Business History* 51, no. 1 (2006): 3–25; Wilfried Reininghaus, *Die Stadt Iserlohn und ihre Kaufleute (1700-1815)*, Untersuchungen zur Wirtschafts-, Sozial- und Technikgeschichte, Bd. 13 (Dortmund: Gesellschaft für Westfälische Wirtschaftsgeschichte; Sander Druck, 1995); Axel Flügel, *Kaufleute und Manufakturen in Bielefeld. Sozialer Wandel und wirtschaftliche Entwicklung im proto-industriellen Leinengewerbe von 1680 bis 1850*, Studien zur Regionalgeschichte Bd. 6 (Bielefeld: Verlag für Regionalgeschichte, 1993).

[4] Richard Tilly, 'Cliometrics in Germany', in *Selected Cliometric Studies on German Economic History*, ed. John Komlos and Eddie Scott (Stuttgart: Franz Steiner Verlag, 1997), 23.

[5] Ulrich Pfister, 'The Quantitative Development of Germany's International Trade during the Eighteenth and Early Nineteenth Centuries', *Revue de l'OFCE* N° 140, no. 4 (20 July 2015): 177; Ulrich Pfister, 'Great Divergence, Consumer Revolution and the Reorganization of Textile Markets: Evidence from Hamburg's Import Trade, Eighteenth Century', *LSE Economic History Working Papers* No. 226 (August 2017).

[6] Ulrich Pfister and Michael Kopsidis, 'Institutions versus Demand: Determinants of Agricultural Development in Saxony, 1660–1850', *European Review of Economic History* 19, no. 3 (2015): 283; German original of quote: "disparate, völlig unzuverlässige[.] statistische[.] Angaben" Hans-Ulrich Wehler, *Deutsche Gesellschaftsgeschichte. Bd.1 Vom Feudalismus des Alten Reiches bis zur Defensiven Modernisierung der Reformära: 1700-1815* (München: C. H. Beck, 1987), 122.

of reliable sources explains why scholars have turned to local, qualitative research instead.[7] To overcome this problem, this dissertation introduces a new source, a business directory from 1798, to construct micro-data on 6099 individual merchant and manufacturing enterprises across 56 towns in Germany. The resulting dataset is the earliest supra-regional evidence on the spatial variation of urban merchant communities in Germany to date.

This paper, therefore, also contributes to a wider ongoing effort that adopts quantitative approaches (and often micro-data) to study the relationship between pre-industrial developments and persistent industrialization and growth outcomes in Germany.[8] It further speaks to the wider debate about the causes of regional and spatial variation in economic development in nineteenth century Germany.[9] While themes of institutional change, human capital, natural resources, religion, rural industry, agricultural commercialization, pre-industrial manufacturing, household fertility choices, and market integration all feature prominently in this literature, merchants and early industrial entrepreneurship have been disregarded entirely.

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[7] For examples of authors discussing lack of quantitative evidence see: Klaus Weber, 'The Atlantic Coast of German Trade: German Rural Industry and Trade in the Atlantic, 1680–1840', *Itinerario* 26, no. 2 (July 2002): 99; Gorißen, *Vom Handelshaus zum Unternehmen: Sozialgeschichte der Firma Harkort im Zeitalter der Protoindustrie (1720-1820)*, 27; Wehler, *Deutsche Gesellschaftsgeschichte Bd.1*, 122–23.

[8] Jeremiah E Dittmar and Ralf R Meisenzahl, 'Public Goods Institutions, Human Capital, and Growth: Evidence from German History', *The Review of Economic Studies* 87, no. 2 (March 2020): 959–96; Davide Cantoni, 'The Economic Effects of the Protestant Reformation: Testing the Weber Hypothesis in the German Lands', *Journal of the European Economic Association* 13, no. 4 (2015): 561–98; Davide Cantoni, Jeremiah Dittmar, and Noam Yuchtman, 'Religious Competition and Reallocation: The Political Economy of Secularization in the Protestant Reformation', *The Quarterly Journal of Economics* 133, no. 4 (November 2018): 2037–96; Sascha O. Becker and Ludger Woessmann, 'Was Weber Wrong? A Human Capital Theory of Protestant Economic History', *The Quarterly Journal of Economics* 124, no. 2 (1 May 2009): 531–96; Erik Hornung, 'Immigration and the Diffusion of Technology: The Huguenot Diaspora in Prussia', *The American Economic Review* 104, no. 1 (2014): 84–122.

[9] Daron Acemoglu et al., 'The Consequences of Radical Reform: The French Revolution', *The American Economic Review* 101, no. 7 (2011): 3286–3307; Wolfgang Keller and Carol H. Shiue, 'Market Integration as a Mechanism of Growth', CESifo Working Paper No. 6070, September 2016; Michael Kopsidis and Daniel W. Bromley, 'The French Revolution and German Industrialization: Dubious Models and Doubtful Causality', *Journal of Institutional Economics* 12, no. 1 (March 2016): 161–90; Alan Fernihough and Kevin Hjortshøj O'Rourke, 'Coal and the European Industrial Revolution', *The Economic Journal* 131, no. 635 (1 April 2021): 1135–49; Sascha O. Becker, Erik Hornung, and Ludger Woessmann, 'Education and Catch-Up in the Industrial Revolution', *American Economic Journal: Macroeconomics* 3, no. 3 (July 2011): 92–126.

This dissertation is split into two parts. The first explores the historiographic background in regard to nineteenth century Germany, the possible determinants of the location of economic activity in it, and the role attributed to merchants by the existing literature. It then conceptually explores the economic function of eighteenth-century merchants, their role as industrial entrepreneurs, and why and how merchants became entrepreneurs. The second part empirically test the significance of differences in late eighteenth century merchant activity for the growth of towns in the nineteenth century. It finds a significant association between proto-firms, the elasticity of supply of early industrial entrepreneurs, and the nineteenth century growth of a town.

1. Literature Survey and Historical Background

1.1 The German Industrialization

The German industrialization experience was characterized by two key features: its relatively late occurrence by western European standards and by 'its enormous regional variation'.[10] The traditional view of the German industrialization stresses 'a significant acceleration of industrial growth since the 1840s (or 1850s) dominated by railroad building and by the expanding heavy industries related to railroads'.[11] More recently an emerging consensus finds that Germany's transition to modern economic growth was much more of a gradual acceleration rather than a Rostovian 'take-off'.[12] However, these generalizations cannot capture the regional nuance. Regions such as the Rhineland and Saxony experienced the onset of industrialization possibly as early as 1815, while regions in the south and the north-east 'failed to industrialize until the late nineteenth century or even later'.[13] This phenomenon of late and early industrializing regions has caused historians

[10] Sheilagh Ogilvie, 'Proto-Industrialization in Germany', in *European Proto-Industrialization*, ed. Markus Cerman and Sheilagh Ogilvie (Cambridge, England; New York, NY, USA: Cambridge University Press, 1996), 121.
[11] Tilly, 'Cliometrics in Germany', 22.
[12] Richard H. Tilly and Michael Kopsidis, *From Old Regime to Industrial State: A History of German Industrialization from the Eighteenth Century to World War I*, *From Old Regime to Industrial State* (University of Chicago Press, 2020), 1–2.
[13] Ogilvie, 'Proto-Industrialization in Germany', 121; Tilly and Kopsidis, *From Old Regime to Industrial State*, 4.

to develop groupings of polities based on shared economic and institutional characteristics.[14] It has also spurred a number of theories, which seek to explain the origins of these variations in experiences. For the purposes of this paper, two deserve particular attention: the 'implanted institutions' theory and the proto-industry debate.

1.2 Potential Drivers of the Spatial Variation: implanted institutions and proto-industry

The 'implanted institutions' literature argues that at the end of the 18th century Germany 'had experienced several centuries of feudal, protectionist, and generally inefficient rule' and its institutional structure prevented its industrialization.[15] It argues that in towns powerful guilds inhibited the adoption of new technologies and rent-seeking patrician elites controlled the political life. Simultaneously, outside of cities the nobility and clergy perpetuated serfdom and hindered the emergence of a uniform legal system.[16] 'Napoleon', so the story goes, 'broke up the system in the west, destroying guilds, secularizing church lands, and introducing more modern commercial law'.[17] For other regions, most notably Prussia, it is argued that the threat emanating from revolutionary France caused 'defensive modernization' and was the key driver behind the implementation of modernizing reforms in the early nineteenth century.[18] Two recent econometric studies have attempted to quantitatively corroborate this line of reasoning. In the first, Acemoglu, Cantoni, Johnson and Robinson (hereafter ACJR) argue that the French occupation reduced the 'grip of the aristocracy, oligarchy and the clergy on

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[14] For example: Harald Frank, *Regionale Entwicklungsdisparitäten im deutschen Industrialisierungsprozess 1849-1939: eine empirisch-analytische Untersuchung*, Münsteraner Beiträge zur Cliometrie und quantitativen Wirtschaftsgeschichte, Bd. 1 (Münster: Lit, 1994).
[15] Wehler calls these 'unüberwindbar wirkende Schranken' that inhibited the emerging dynamism of the late eighteenth century. Wehler, *Deutsche Gesellschaftsgeschichte Bd.1*, 332; Quote from: Keller and Shiue, 'Market Integration as a Mechanism of Growth', 3.
[16] Keller and Shiue, 'Market Integration as a Mechanism of Growth', 2–4; Acemoglu et al., 'The Consequences of Radical Reform'.
[17] Charles P. Kindleberger, 'Germany's Overtaking of England, 1806 — 1914: Part I', *Weltwirtschaftliches Archiv* 111, no. 2 (1975): 257.
[18] Acemoglu et al., 'The Consequences of Radical Reform', 3289–97; For an extensive discussion of 'defensive modernization' see: Wehler, *Deutsche Gesellschaftsgeschichte Bd.1*, 363–485; For an account of the role of the bureaucracy in implementing reforms see: Jürgen Kocka, 'Capitalism and Bureaucracy in German Industrialization before 1914', *The Economic History Review* 34, no. 3 (1981): 454.

political and economic power' and thus facilitated the emergence of industrialization in occupied regions.[19] They present evidence that the French occupation resulted in earlier legal reform, agricultural reform, abolition of guilds and abolition of serfdom, and that these reforms as well as a longer 'French treatment' are associated with higher urbanization rates during the industrialization. The second paper by Keller and Shiue states that French rule meant that 'Germany came under the influence of ideas of freedom and equality', saw 'the introduction of a purposive and uniform administration' and was subject to reforms that 'swept away feudal institution in Germany, replacing them with better institutions that were inspired by new ideas of freedom and equality'.[20] It concludes that the implanted institutions predominantly effected growth through the channel of increased market integration.[21]

Particularly the work by ACJR has been subject to extensive critique. Firstly, the coefficient in their model only become positive for the years 1875 and 1900 and even then, none are statistically significant.[22] Unlike their claim, however, the negative coefficients in 1850 cannot be explained by the negative direct effects of the Napoleonic wars, as the post-war recovery is considered to have been complete by ca. 1820, and the direct economic consequences were largely insignificant.[23] Moreover, Bromley and Kopsidis have shown that for 31 out of 57 observations, the year of institutional reform recorded in their model was not in line with the accepted German historiography and that correcting these inaccuracies causes the territories in the 'treatment' group to no longer have earlier reforms on average.[24]

Furthermore, using the number of years under French occupation as an instrument for better institutions, as both papers do, is historically inaccurate, as

[19] Acemoglu et al., 'The Consequences of Radical Reform', 3287.
[20] Keller and Shiue, 'Market Integration as a Mechanism of Growth', 2–4.
[21] Keller and Shiue, 24.
[22] Ulrich Pfister, 'Gewalt, institutionelle Schocks und Entwicklung: Wirtschaftliche Folgen der Koalitions- und napoleonischen Kriege (1792-1815) in Deutschland', *Vierteljahrschrift für Sozial- und Wirtschaftsgeschichte* 107, no. 1 (2020): 33.
[23] Pfister, 19–24.
[24] Kopsidis and Bromley, 'The French Revolution and German Industrialization: Dubious Models and Doubtful Causality', 166.

formal institutions and private order institutions could be significantly different. Only roughly 5% of the German population was 'exposed to direct French occupation for more than 6 years'.[25] And 6 years or less often proved insufficient to introduce any lasting modernizing reforms, as the *Großherzogtum Berg* exemplifies. In Berg, many policies such as the introduction of assemblies with legislative capacities, the standardization of weights and measurements, or the introduction of courts of commercial law never made it past the planning stage. Others were only introduced too late to have any significant effect. The introduction of the Franc as a common currency was formally declared per decree in 1810, but evidence from merchant account books shows that this led to no change in its usage.[26] Instead, the use of old currencies persisted. Similarly, the 'Code de Commerce' was only introduced by decree in October 1810, too late to have any real-world implications.[27] Furthermore, in many territories occupied by the French institutional reforms were quickly repealed once the occupation ended, leaving little trace.[28] Many of the modernizing policies that were not immediately repealed upon the departure of French administrators, had antecedents in domestic policies in the years prior to the French occupation. The tax reforms introduced by the French, for example, had no significant impact, as similar reforms had already been introduced by Prussian administrators in 1791.[29] In many places, other reforms that remained in place, such as the abolition of serfdom, simply formalized a system that was already a de facto reality and closed the gap between private order institutions and formal institutions.[30]

There is reason to believe that the Napoleonic wars were not the starting point of institutional modernization in German territories, but rather a brief intermezzo. The breakdown of the institutions of the *ancien regime* began many years before

[25] Kopsidis and Bromley, 164.
[26] Gorißen, *Vom Handelshaus zum Unternehmen: Sozialgeschichte der Firma Harkort im Zeitalter der Protoindustrie (1720-1820)*, 109.
[27] Gorißen, 109.
[28] Kopsidis and Bromley, 'The French Revolution and German Industrialization: Dubious Models and Doubtful Causality', 176–78.
[29] Gorißen, *Vom Handelshaus zum Unternehmen: Sozialgeschichte der Firma Harkort im Zeitalter der Protoindustrie (1720-1820)*, 109.
[30] Tilly and Kopsidis, *From Old Regime to Industrial State*, 70; Kopsidis and Bromley, 'The French Revolution and German Industrialization: Dubious Models and Doubtful Causality', 166.

the wars and had already reached substantial momentum by the end of the eighteenth century. By the 1790s the guild system and corporate urban institutions were in crisis.[31] Corporate groups, especially the privileged merchant companies, were rapidly breaking down during this period.[32] In 1797 even the *Calwer Zeughandlungskompagnie*, the darling of many economic historians and an epitome of a modernization-inhibiting early modern corporate institution, disintegrated.[33] The situation of craft guilds was no better. Their grip on power started weakening increasingly from the mid eighteenth century onwards. In some cases, such as Saxony, this process was shaped by governments, which were freely granting exceptions and legalizing violations to the guild-system.[34] Elsewhere, it was a more bottom-up process. By the turn of the century de facto free markets and *Gewerbefreiheit* had emerged in the duchy of Berg as well as northern and eastern Westphalia.[35] Certainly, this process of endogenous modernization was not uniform, with substantial variations in the dynamism across space. Important to note, however, is that the regions occupied by the French were already experiencing substantially greater institutional modernization and structural transformation of the economy in the late eighteenth century.[36] While the ideas and ideals associated with the French revolution undoubtedly had marked effects on Western Europe, there appears to be no empiric evidence that corroborates the claim that the French occupation led to persistent positive economic outcomes and helps explain the spatial variation in these outcomes in across the nineteenth century.[37]

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[31] Wehler, *Deutsche Gesellschaftsgeschichte Bd.1*, 94.
[32] Tilly and Kopsidis, *From Old Regime to Industrial State*, 52–53.
[33] Christian Kleinschmidt, 'Weltwirtschaft, Staat und Unternehmen im 18. Jahrhundert: Ein Beitrag zur Protoindustrialisierungsdebatte', *Zeitschrift für Unternehmensgeschichte / Journal of Business History* 47, no. 1 (2002): 72; Walter Troeltsch, *Die Calwer Zeughandlungskompagnie und ihre Arbeiter. Studien zur Gewerbe- und Sozialgeschichte Altwürttembergs.* (Jena: Fischer, 1897); Sheilagh Ogilvie, *State Corporatism and Proto-Industry: The Württemberg Black Forest, 1580–1797*, Cambridge Studies in Population, Economy and Society in Past Time (Cambridge: Cambridge University Press, 1997).
[34] Tilly and Kopsidis, *From Old Regime to Industrial State*, 30.
[35] Clemens Wischermann, 'Frühindustrielle Unternehmensgeschichte in Institutionalistischer Perspektive', *Geschichte Und Gesellschaft* 19, no. 4 (1993): 464; Tilly and Kopsidis, *From Old Regime to Industrial State*, 40.
[36] Tilly and Kopsidis, *From Old Regime to Industrial State*, 4.
[37] The Napoleonic wars, rather than the French occupation, may have had some effect through its temporary disruption of the European economy. Most notably, the continental system caused temporary dislocations for northern German regions that depended on trade, while it also led to a

If the French occupation can neither explain the observed institutional change nor the spatial variation in nineteenth century growth outcomes, an alternative explanation is needed. Particularly salient is the role of export oriented rural industry that increasingly proliferated in the seventeenth and eighteenth century, not just in Germany but in Europe as a whole.[38] An emphasis on and interest in this phenomenon has a long history in German scholarship, with Werner Sombart equating the history of rural industries with the 'history of capitalism'.[39] The theory of 'proto-industrialization', which first emerged in the 1970s, formulates a comprehensive argument for why and how export-oriented rural industry was a direct and necessary precursor for the subsequent factory industrialization, a 'first-phase' of the industrialization process.[40] Kriedte, Medick and Schlumbohm describe an emergence of the factory industrialization in stages, where the rural producer progressively lost autonomy from the *Kaufsystem*, where he was still autonomous in production, buying and selling, to the *Verlagsystem*, in which this autonomy was increasingly compromised, to the *Factory System*, in which the transition to the industrial labourer was complete.[41] While a number of different versions of the 'proto-industrialization' theory have emerged, they share some common claims.[42] The main hypotheses of causal relationship between proto-industrialization and factory industrialization can be summarized as follows: (1) the additional income from wage labour for rural households led to a breakdown

surge for some domestic manufacturing industries. However, many of these effects were only temporary. Pfister, 'Gewalt, institutionelle Schocks und Entwicklung: Wirtschaftliche Folgen der Koalitions- und napoleonischen Kriege (1792-1815) in Deutschland'; Francois Crouzet, 'Wars, Blockade, and Economic Change in Europe, 1792-1815', *The Journal of Economic History* 24, no. 4 (December 1964): 586–88; Kevin Hjortshøj O'Rourke, 'The Worldwide Economic Impact of the French Revolutionary and Napoleonic Wars, 1793-1815', *Journal of Global History* 1, no. 1 (2006): 123–49.

[38] Ogilvie, *State Corporatism and Proto-Industry*, 1–3; Gorißen, *Vom Handelshaus zum Unternehmen: Sozialgeschichte der Firma Harkort im Zeitalter der Protoindustrie (1720-1820)*, 17.

[39] Ogilvie, 'Proto-Industrialization in Germany', 121–22; Wehler, *Deutsche Gesellschaftsgeschichte Bd.1*, 102.

[40] Franklin F. Mendels, 'Proto-Industrialization: The First Phase of the Industrialization Process', *The Journal of Economic History* 32, no. 1 (March 1972): 241–61.

[41] Peter Kriedte, Hans Medick, and Jürgen Schlumbohm, *Industrialization before Industrialization: Rural Industry in the Genesis of Capitalism*, Studies in Modern Capitalism (Cambridge: University Press, 1981); Sheilagh Ogilvie, 'Protoindustrialization', in *The New Palgrave Dictionary of Economics* (London: Palgrave Macmillan, 2016), 3.

[42] For an excellent short literature survey of the different strands, see: Ogilvie, 'Protoindustrialization'.

of the Malthusian demographic system, (2) there was substantial capital accumulation in the hands of the merchants, commercial farmers and landowners thus creating the capital for factory industrialization, (3) rural industry led to an increased commercialization of agriculture which prepared it for the supply of industrial towns, (4) it trained both merchants and workers in the 'skills needed for factory industrialization' and (5) ultimately the diminishing returns to dispersed production will incentivize the centralization of production and with it the emergence of factories.[43] Some authors have additionally claimed that it was the period of transition from 'feudalism' to 'capitalism'.[44]

Recent empiric studies have found that there were substantial regional developments in eighteenth century in both agricultural commercialization and the breakdown of the Malthusian population dynamic in regions with proliferating export oriented rural industries. Pfister and Kopsidis find that in Saxony between 1660-1850, the increasing demand for foodstuff from rural industry was the key driver behind the increasingly intensive agricultural production, whereas changes in formal institutions appears to have had no significant effect, and urbanization rates remained largely constant across this time.[45] Similarly, an empiric study of Westphalia between 1740-1800 finds that 'agricultural growth in [western Westphalia and the lower Rhineland] was driven entirely by demand from a growing number of households engaged in proto-industrial and early industrial manufacture production'.[46]

[43] D. C. Coleman, 'Proto-Industrialization: A Concept Too Many', *The Economic History Review* 36, no. 3 (1983): 436–38; Ogilvie, 'Protoindustrialization', 4; Franklin Mendels, 'Proto-Industrialization: Theory and Reality. General Report', in *Eighth International Economic History Congress: Budapest 1982: 'A' Themes*, ed. P. Deyon and F. Mendels (Budapest: Akadémiai Kiadó, 1982), 69–107.
[44] Kriedte, Medick, and Schlumbohm, *Industrialization before Industrialization: Rural Industry in the Genesis of Capitalism*; Coleman, 'Proto-Industrialization', 438.
[45] Pfister and Kopsidis, 'Institutions versus Demand: Determinants of Agricultural Development in Saxony, 1660–1850'.
[46] Michael Kopsidis et al., 'Agricultural Output Growth in a Proto- and Early Industrial Setting: Evidence from Sharecropping in Western Westphalia and the Lower Rhineland, c. 1740–1860', *Rural History* 28, no. 1 (April 2017): 21.

There were not just improvements in agricultural productivity, but also changes in the demographic regime. Pfister and Fertig find that starting in the 1720s a Malthusian disequilibrium emerged and by the 1810s a post-Malthusian demographic dynamic had emerged.[47] However, in the case of demographics the direction of causality is not comprehensively proven. Wehler argued that the expansion of rural industry was particularly closely connected with the general population growth that began in the 1740s.[48] Furthermore, the effect of proto-industry on fertility decisions may have varied significantly, as studies of proto-industrial households have failed to find evidence for the claim that proto-industrial employment led to an increased fertility.[49]

The theory of proto-industrialization has been criticized for its disregard for the role of non-rural industry and the often ambiguous evidence that does not necessarily corroborate the claims made about the causal relationships between rural industry and factory industrialization.[50] It has also been criticized for its vagueness, and indeed may be more of a 'suggestive hypothesis' than a conclusive theory.[51] Most importantly, at the present, proto-industrialization theory alone cannot explain why in 1800 the Lower Rhine, Saxony, Thuringia, Westphalia, Baden, Württemberg, and Bavaria all had more than 60 rural industrial producers per 1000 inhabitants**,** yet some started to industrialize by about 1815, while others 'stubbornly resisted industrialization until after about 1870'.[52]

One dimension that has received remarkably little attention in the proto-industrialization debate is that of merchants and early entrepreneurship. Many

[47] Ulrich Pfister and Georg Fertig, 'From Malthusian Disequilibrium to the Post-Malthusian Era: The Evolution of the Preventive and Positive Checks in Germany, 1730–1870', *Demography* 57, no. 3 (4 May 2020): 1145–70; See also: Tilly and Kopsidis, *From Old Regime to Industrial State*, 15–19.
[48] Wehler, *Deutsche Gesellschaftsgeschichte Bd.1*, 101.
[49] Markus Cerman, 'Proto-Industrialization in an Urban Environment: Vienna, 1750–1857', *Continuity and Change* 8, no. 2 (August 1993): 281–320.
[50] Ogilvie, *State Corporatism and Proto-Industry*; Rab Houston and K. D. M. Snell, 'Proto-Industrialization? Cottage Industry, Social Change, and Industrial Revolution', *The Historical Journal* 27, no. 2 (1984): 473–92; Ogilvie, 'Protoindustrialization'.
[51] Coleman, 'Proto-Industrialization', 446.
[52] Ogilvie, 'Proto-Industrialization in Germany', 133.

authors only acknowledge it in passing, while focusing on demographic, class formation, or institutional dynamics.[53] They implicitly limit the role of the merchant to that of the capital accumulator who provides the necessary capital to acquire industrial machinery.[54] Yet, merchants were the sine qua non of rural industry. They oversaw the import of raw materials and the export of finished products, they fulfilled crucial functions in transport and transaction, and often coordinated large numbers of rural producers. While capital accumulation was one of their functions, limiting the significance of merchants to it leads to serious shortcomings in the understanding of potential continuities between early modern and industrial industries. Moreover, the proto-industrialization literature paints a picture of a monolithic merchant community which readily responded to any change in market conditions or institutions. Unsurprisingly, this simplistic assumption fails to capture the tremendous diversity within eighteenth century merchant communities and how differences in merchant communities could yield divergent economic outcomes. The following sections of this dissertation address this limited understanding of eighteenth-century merchants in the current literature, particularly in regard to their transition into entrepreneurship.

1.3 The Economic Function of Merchants

The most fundamental economic function of merchants lies in their role of reducing transaction costs, facilitating exchange, and in being the 'principal intermediaries of continuous trading relations'.[55] In the centuries prior to the industrial revolution, merchants grew in number and importance as European markets increasingly integrated and colonial trade enabled unprecedented distances of exchange.[56] While Germany was relatively removed from the long-

[53] A critique of the proto-industry literature that has also been articulated by Stefan Gorißen. Gorißen, *Vom Handelshaus zum Unternehmen: Sozialgeschichte der Firma Harkort im Zeitalter der Protoindustrie (1720-1820)*, 28; For one of many examples see: Peter Kriedte, *Spätfeudalismus und Handelskapital: Grundlinien der europäischen Wirtschaftsgeschichte vom 16. bist zum Ausgang des 18. Jahrhunderts* (Göttingen: Vandenhoeck & Ruprecht, 1980), 160.
[54] E.g., Gay L. Gullickson, 'Agriculture and Cottage Industry: Redefining the Causes of Proto-Industrialization', *The Journal of Economic History* 43, no. 4 (1983): 849–50.
[55] Tilly and Kopsidis, *From Old Regime to Industrial State*, 66.
[56] Giovanni Federico, Max-Stephan Schulze, and Oliver Volckart, 'European Goods Market Integration in the Very Long Run: From the Black Death to the First World War', *The Journal of Economic History* 81, no. 1 (March 2021): 276–308; David Chilosi, Max-Stephan Schulze, and

distance trade via the Atlantic ocean, it nonetheless participated in the general upswing of trade. Between the 1730s and 1790s, the import of colonial goods (especially coffee and sugar) grew at almost 2% annually – roughly the same rate as the growth of cross-Atlantic trade.[57] During the same period, Germany's growth in international trade was double its population growth rates.[58] As trade increased and distant markets integrated, export oriented rural industry increasingly proliferated. In the proto-industrial region of Silesia, of all officially controlled linen exports between 1748 and 1788 76.6% were exported to the nations of the Atlantic economy and the Caribbean, while only 8.4% were exported to the German imperial territories.[59] Meanwhile some towns, such as Iserlohn, became hubs of export oriented industries in the production of metal ware and tools.[60] The demand for German textiles was so high abroad that one author noted that 'when a Spanish trader comes into a store in a British island, the first article he asks for is German linens'.[61] German merchants often combined the export of proto-industrial produce with the import of colonial consumer goods. For example, the Melsunger 'Hantierungsschlag' from 1746 and a similar source from Waldkappel in 1744 mention many such merchants that traded in linens *en gros* and colonial

Oliver Volckart, 'Benefits of Empire? Capital Market Integration North and South of the Alps, 1350–1800', *The Journal of Economic History* 78, no. 3 (September 2018): 637–72.

[57] Pfister, 'The Quantitative Development of Germany's International Trade during the Eighteenth and Early Nineteenth Centuries', 214; Michael North, 'Von der Atlantischen Handelsexpansion bis zu den Agrarreformen (1450-1815)', in *Deutsche Wirtschaftsgeschichte: ein Jahrtausend im Überblick*, ed. Michael North, 2nd ed. (München: Beck, 2005), 156.

[58] Pfister, 'The Quantitative Development of Germany's International Trade during the Eighteenth and Early Nineteenth Centuries', 213.

[59] Weber, 'The Atlantic Coast of German Trade', 102.

[60] Kleinschmidt, 'Weltwirtschaft, Staat und Unternehmen im 18. Jahrhundert', 75.

[61] Elisabeth Karin Newman, 'Anglo-Hamburg Trade in the Late Seventeenth and Early Eighteenth Centuries' (Ph.D., London, London School of Economics and Political Science, 1979), 200; cited in Weber, 'The Atlantic Coast of German Trade', 101.

goods *en detail*.[62] This import of colonial goods crucially balanced out the export of proto-industrial goods.[63]

It is important to note, however, that the growth in trade varied extensively regionally. While evidence from Cologne suggests a significant expansion in the volume of trade in the eighteenth century, import and export numbers in Bavaria appear to have stagnated.[64] At the present, the evidence is too scarce to paint a conclusive picture of how the eighteenth-century expansion in trade varied across German regions. However, for the purposes of this paper, it is important to note that it appears that those regions which became early industrializers also saw substantial market integration gains in the eighteenth century.[65]

Between ca.1750 and ca.1850 merchants gained a new economic function: becoming early industrial entrepreneurs. In 1783/4, the merchant Johann Gottfried Brügelmann in Ratingen became the first person to set up a mechanized large-scale cotton-spinning works, a site that utilized spinning jennies and totalled 1600 spindles, on the European mainland.[66] During this time, future leading industrial dynasties in the west such as the Krupp, Stinnes, Mannesmann, Haniel, Liebrecht, and more, all started their transition from merchant to industrial

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[62] Conrad Riemann in Waldkappel, for example, was observed to trade 'mit Bremer Ware, welcher er von den mündischen Kaufleuten nehme, und bezahlte solche statt baren Geldes mit Leinentuch'. Peter Kriedte, 'Vom Großhändler zum Detaillisten. Der Handel mit "Kolonialwaren" im 17. und 18. Jahrhundert', *Jahrbuch für Wirtschaftsgeschichte / Economic History Yearbook* 35, no. 1 (June 1994): 33–34; On the combination of en detail with en gros trade, see also: Gorißen, *Vom Handelshaus zum Unternehmen: Sozialgeschichte der Firma Harkort im Zeitalter der Protoindustrie (1720-1820)*, 378.

[63] Niemann, 'Kontinuitätssicherung durch Transformation. Die Entwicklung des Bramscher Familienunternehmens Sanders vom protoindustriellen Leinenhandel zur industriellen Weberei', 9.

[64] Pfister, 'The Quantitative Development of Germany's International Trade during the Eighteenth and Early Nineteenth Centuries', 184–87.

[65] Evidence is particularly strong for Westphalia and western Germany. See: Hakon Albers, Ulrich Pfister, and Martin Uebele, 'The Great Moderation of Grain Price Volatility: Market Integration vs. Climate Change, Germany, 1650–1790', EHES Working Papers in Economic History No. 135, August 2018.

[66] Wehler, *Deutsche Gesellschaftsgeschichte Bd.1*, 494; Gorißen, *Vom Handelshaus zum Unternehmen: Sozialgeschichte der Firma Harkort im Zeitalter der Protoindustrie (1720-1820)*, 85; Charles P. Kindleberger, 'Commercial Expansion and the Industrial Revolution', *Journal of European Economic History* 4, no. 3 (Winter 1975): 643.

entrepreneur.[67] Detailed research into the social origins of entrepreneurs in Berlin and other Prussian cities during the early phases of the industrialization has confirmed the dominance of merchants in founding early industrial enterprises.[68] Certainly not all industrial entrepreneurs were from merchant families and a significant number had a background in crafts; however, craftsmen-entrepreneurship was often substantially inhibited by a lack of capital, market knowledge, and business contacts in export markets.[69] Merchants, on the other hand, often had all of these. Merchant-enterprises were, therefore, usually two to three times the size of craftsmen-enterprises during this period, with craftsmen-enterprises being concentrated in less capital-intensive sectors and being of small-scale.[70] Other social groups, such as government officials or members of the *Bildungsbürgertum* (educated burgher class) played a negligible role. Only ca. 5% of the 400 to 450 large-scale manufacturing enterprises studied by Rolf Straubel were run or founded by the state.[71] Studying the role of merchants in Germany's industrialization therefore necessitates studying early industrial entrepreneurship.

1.4 A Taxonomy of Late Eighteenth Century Merchants

Merchants were far from a homogenous group. The life of an Atlantic *Grosskaufmann* of Hamburg had little in common with that of a *Krämer* of upper Lusatia. Understanding the differences between merchants is crucial to understanding who exactly transitioned into industrial entrepreneurship and why

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[67] Tilly and Kopsidis, *From Old Regime to Industrial State*, 51; Kindleberger, 'Commercial Expansion and the Industrial Revolution', 643.
[68] Hartmut Kaelble, *Berliner Unternehmer während der frühen Industrialisierung*, Veröffentlichungen der Historischen Kommission zu Berlin 40 (Berlin: Walter de Gruyter & Co., 1972), 39; Jürgen Kocka, *Unternehmer in der deutschen Industrialisierung*, Kleine Vandenhoeck-Reihe 1412 (Göttingen: Vandenhoeck & Ruprecht, 1975); Jürgen Kocka and Reinhard Vogelsang, eds., *Bielefelder Unternehmer des 18. bis 20. Jahrhunderts*, Rheinisch-Westfälische Wirtschaftsbiographien 14 (Münster: Aschendorff, 1991); Rolf Straubel, *Kaufleute und Manufakturunternehmer. Eine empirische Untersuchung über die sozialen Träger von Handel und Großgewerbe in den mittleren preußischen Provinzen (1763 bis 1815)*, Vierteljahrschrift für Sozial- und Wirtschaftsgeschichte: Beihefte 122 (Stuttgart: Franz Steiner Verlag, 1995).
[69] Jürgen Kocka, 'Entrepreneurs and Managers in German Industrialization', in *The Cambridge Economic History of Europe: Volume 7: The Industrial Economies: Capital, Labour and Enterprise*, ed. M. M. Postan and Peter Mathias (Cambridge: Cambridge University Press, 1978), 499.
[70] Straubel, *Kaufleute und Manufakturunternehmer*, 101, 114, 122, 134, 138, 143, 153.
[71] Straubel, 97.

this occurred. Contemporaries classified merchants predominantly by the size of their operations: whether someone traded *en gros* or *en detail*, and whether they were a *Kaufmann* (merchant) or a *Hausierer* (peddler). The size of a merchant's operations, however, provides little insight about the different *types* of merchants. For understanding early entrepreneurship, the degree of capital investment and closeness to the production process are two crucial dimensions. Stefan Gorißen offers a taxonomy of eighteenth-century merchants which uses precisely these indicators. He distinguished between four main categories: 'Nur-Kaufleute' (pure merchants), 'Verleger-Kaufleute' (putting-out merchants), 'Fabriquen-Kaufleute' (fabrique-merchants) and 'Manufaktur-Unternehmer' (manufactory-entrepreneurs).[72]

The *'Nur-Kaufleute'* are merchants who deal exclusively with the distribution and marketing of goods, having no direct involvement with the production process nor any capital investment. All their capital is exclusively in the form of credits and stock of goods. The possibly wealthiest subgroup of this category is that of the *Fernhandelskaufleute* (long-distance traders). *Fernhandelskaufleute* were generally concentrated in important trade ports and markets of supra-regional significance, such as Hamburg, Frankfurt, or Leipzig.[73] Since in pre-modern long-distance trade trust and relationships were essential in reducing barriers to exchange, these merchants seldom specialized in a specific range of goods, but rather in the trade with a certain region.[74] The 'Bergenfahrgesellschaften' of Lübeck, Hamburg, and Bremen, which specialized in trading with Norwegian ports, were an example of this phenomenon.[75] *Fernhandelskaufleute* that amassed significant capital often became merchant-bankers rather than merchant-entrepreneurs, a development exemplified by the Berenberg family in Hamburg

[72] Gorißen, *Vom Handelshaus zum Unternehmen: Sozialgeschichte der Firma Harkort im Zeitalter der Protoindustrie (1720-1820)*, 370–80.
[73] Gorißen, 370–71.
[74] On the importance of relationships in facilitating pre-industrial trade see: Avner Greif, *Institutions and the Path to the Modern Economy: Lessons from Medieval Trade*, Political Economy of Institutions and Decisions (Cambridge: Cambridge University Press, 2006).
[75] Gorißen, *Vom Handelshaus zum Unternehmen: Sozialgeschichte der Firma Harkort im Zeitalter der Protoindustrie (1720-1820)*, 381.

or the Bethman family in Frankfurt.[76] The comparatively small importance of German marketplaces for the emerging global economy, may thus help explain why early banking and capital markets in Germany were less developed than those in England. The most important marketplace, Hamburg, took on a leading role in Germany's early banking history.[77] A second subgroup is that of the *Höker, Krämer,* and *Hausierer* (peddlers and hawkers), whose primary function was the final step of the product distribution process: the sale to the consumer. They were particularly important in integrating remote hinterlands into the distribution of consumer goods and in the diffusion of novel consumer goods into these areas. As they lacked capital and business contacts, they almost never became industrial entrepreneurs. A third important subgroup is that of *Kommissionshändler* (commissionaires) and *Speditionshändler* (transport commissionaires). Both of these are forms of mercantile activity that reduce the transaction costs associated with long-distance trade.[78] Without commissionaires, those wishing to sell at distant markets were facing tremendous costs associated with acquiring the necessary knowledge of the export markets and the business relationships necessary to find a purchaser for the products. *Kommissionshändler* resolved this by selling and purchasing products at the major marketplaces on behalf of merchants and producers in the hinterland against a fee.[79] They fulfilled a pivotal role in facilitating the export of proto-industrial products ranging from Silesian

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[76] Percy Ernst Schramm, 'Hamburger Kaufleute in der 2. Hälfte des 18. Jahrhunderts', *Tradition: Zeitschrift für Firmengeschichte und Unternehmerbiographie* 2, no. 4 (1957): 332; North, 'Von der Atlantischen Handelsexpansion bis zu den Agrarreformen (1450-1815)', 167.
[77] W. O. Henderson, 'The Genesis of the Industrial Revolution in France and Germany in the 18th Century', *Kyklos* 9, no. 2 (1956): 199.
[78] Stefan Gorißen, 'Differenzierung und Spezialisierung im Fernhandel des 17. und 18. Jahrhunderts. Zur Bedeutung des Kommissions- und Speditionshandels', in *Wirtschaft – Kultur – Geschichte. Positionen und Perspektiven*, ed. S Hilger and A Landwehr (Stuttgart: Steiner, 2011), 60.
[79] One contemporary publication defines *Kommissionshandel* as 'die Eincaßierung und auszahlung baarer Gelder, auf Banco- und Wechselnegotien, auf den Ein- und Verkauf gewisser Waaren oder deren Empfang und Spedirung, auf die Befrachtung der Schiffe, auf Assecuranzen, und überhaupt auf alle von der Handlung herkommende Verrichtungen, die einem Kaufmann an einen anderen Orte, al dem Orte seines Aufenthaltes, zu besorgen obliegen'. Carl Günther Ludovici, *Grundriß eines vollständigen Kaufmanns-Systems nebst den Anfangsgründen der Handlungswissenschaft und angehängter kurzen Geschichte der Handlung zu Wasser und zu Lande*, Zweyte vermehrte und verbesserte Auflage (Leipzig: Bernhard Christoph Breitkopf und Sohn, 1768), 221; Cited in Gorißen, 'Differenzierung und Spezialisierung im Fernhandel des 17. und 18. Jahrhunderts. Zur Bedeutung des Kommissions- und Speditionshandels', 46.

linen to Berlin silk industries.[80] *Speditionshandel* was a special form of commission which was exclusively concerned with the transport of goods. The Sanders family from Bramsche, for example, exported Westphalian linens by hiring *Speditionshändler* in Nordhorn to oversee transport and *Kommissionshändler* in Amsterdam to sell the goods on their behalf.[81] However, *Speditionshandel* is barely researched.[82] It has been observed that it expanded in connection with a general expansion of trade in the second half of the eighteenth century.[83] In Lüneburg, 52 individuals were making a living as *Spediteure* in 1797 – an unprecedentedly high number.[84] However, merchants that engaged in *Speditionshandel* and *Kommissionshandel* often carried it out on the side in addition to their own trade. Both forms of trade proliferated across the later seventeenth and eighteenth century.[85]

The 'Verleger-Kaufleute' (putting-out merchants) were the crucial link between the rural labour surplus and distant markets. Under the *Kaufsystem* (workshops system) rural households would purchase raw materials and necessary tools themselves and their output was purchased by merchants who would then export it to distant markets. However, in some places the merchants in the *Kaufsystem* started providing credit, tools, and materials to rural producers, thus gradually shifting closer to the production process. The resulting system is referred to as the *Verlagsystem* (putting-out system). Crucially, putting-out merchants were

[80] Kleinschmidt, 'Weltwirtschaft, Staat und Unternehmen im 18. Jahrhundert', 75; Gorißen, *Vom Handelshaus zum Unternehmen: Sozialgeschichte der Firma Harkort im Zeitalter der Protoindustrie (1720-1820)*, 382; Straubel, *Kaufleute und Manufakturunternehmer*, 99.
[81] Niemann, 'Kontinuitätssicherung durch Transformation. Die Entwicklung des Bramscher Familienunternehmens Sanders vom protoindustriellen Leinenhandel zur industriellen Weberei', 9.
[82] North, 'Von der Atlantischen Handelsexpansion bis zu den Agrarreformen (1450-1815)', 169.
[83] *Speditionshandel* Gustav von Gülich, *Ueber den gegenwärtigen Zustand des Ackerbaus, des Handels und der Gewerbe im Königreiche Hannover* (Hahn, 1827), 2.
[84] Teresa Becker, '"Das Commerz muß nicht alle Ordnung umstossen wollen". Das Verhältnis von Politik und Handel in Lüneburg und Hann. Münden im 18. Jahrhundert.' (Hannover, Gottfried Wilhelm Leibniz Universität Hannover, 2013), 262.
[85] Gorißen, 'Differenzierung und Spezialisierung im Fernhandel des 17. und 18. Jahrhunderts. Zur Bedeutung des Kommissions- und Speditionshandels', 46. The Sanders family in Bramsche, for example, increasingly shifted from using *Provisionshandel* (Ankaufhandel) to *Kommissionshandel* during the eighteenth century. Niemann, 'Kontinuitätssicherung durch Transformation. Die Entwicklung des Bramscher Familienunternehmens Sanders vom protoindustriellen Leinenhandel zur industriellen Weberei', 13.

significantly closer to the production process than the 'Nur-Kaufleute'. They would either export their produce directly to wholesale merchants at supra-regional marketplaces via *Kommissionshändler* or sell to intermediary traders who exported the products themselves. 'Verleger-Kaufleute' were in themselves a diverse group, working with rural and urban producers as well as sometimes in collaboration and at other times in competition with existing corporate groups.[86] 'Verleger-Kaufleute' at times oversaw operations of substantial scale, which possibly provided helpful organizational experience for the formation of industrial enterprises. Schüler's calico enterprise in Augsburg, for example, oversaw over 3000 producers in both rural and urban settings.[87] The transition of 'Verleger-Kaufleute' into industry has been subject to a number of detailed case studies, such as the role of the 'Reidemeister' in the duchy of Berg.[88]

The third group, the 'Fabriquen-Kaufleute', form a special category of merchants which was predominantly associated with rural mining and metalworking industries.[89] Compared to the putting-out merchants which were concentrated in textile industries, the 'Fabriquen-Kaufleute' required greater capital investments and a greater spatial concentration of workers due to the nature of the metalware production process. These Fabriquen often relied on natural resources for energy and raw materials and thus were often located in rural regions, with merchants rarely living in towns.[90]

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[86] Tilly and Kopsidis, *From Old Regime to Industrial State*, 24, 43; Gullickson, 'Agriculture and Cottage Industry', 847; Cerman, 'Proto-Industrialization in an Urban Environment'.
[87] Bernhard Kirchgässner, *Einführung in die Wirtschaftsgeschichte. Grundriss der deutschen Wirtschafts- und Sozialgeschichte bis zum Ende des alten Reiches* (Düsseldorf: Werner, 1979), 205.
[88] Michael Scherm, 'Kleine und mittelständische Betriebe in unternehmerischen Netzwerken: Die Reidemeister auf der Vollme im vor- und frühindustriellen Metallgewerbe der Grafschaft Mark' (Inaugural-Dissertation zur Erlangung der Doktorwürde, Regensburg, Universität Regensburg, 2007); Kocka, 'Entrepreneurs and Managers in German Industrialization', 508.
[89] They are not to be confused with the French 'merchands-fabricants', who were in fact putting-out merchants ('Verleger-Kaufleute'). In 1760, the tax rolls of Anduze recorded a group of 'merchands-fabricants' who employed a 'group of 26 facturiers who, in turn, supervised the production of 13 master-weavers and 65 very poor weavers'.
Gwynne Lewis, 'Proto-Industrialization in France', *The Economic History Review* 47, no. 1 (1994): 154–55.
[90] Gorißen, *Vom Handelshaus zum Unternehmen: Sozialgeschichte der Firma Harkort im Zeitalter der Protoindustrie (1720-1820)*, 376.

The final category, the 'Manufaktur-Unternehmer', had the highest capital investments into the production process and the greatest degree of control over it. However, they were also the smallest group. At the start of the nineteenth century, there were only around 1000 *Manufakturen* employing ca.100,000 workers in the entire Holy Roman Empire.[91] Quantitative studies into the socio-economic backgrounds of these manufactory entrepreneurs has shown that the majority of them originally stemmed from merchant families.[92] While eighteenth century manufactories may seem like the natural antecedents of the industrial factory, given the shared features of the comparatively great capital investments and concentration of wage labour, this was not necessarily the case. Jürgen Kocka found that 'only a minority of the manufactories existing in 1800 succeeded in changing over to mechanized production. The majority disappeared'.[93] However, despite the lack of continuity between early modern manufactories and industrial factories, the social group of the 'Manufaktur-Unternehmer' frequently transitioned into industrial entrepreneurship. By the second half of the eighteenth century the 'Manufaktur-Unternehmer' became the first merchants to combine the functions of the capitalist, entrepreneur, and manager in one person and they were able to transfer this experience into the nineteenth century.[94]

Gorißen's taxonomy helpfully disentangles the broad range of economic actors bunched together into the term 'merchants' for the eighteenth century. It also sheds a light on the fact that the relative size of these groups varied extensively across space, depending on a place's function. Ultimately, the greater the pre-industrial capital involvement of a merchant in the production process, the lower his barriers to transitioning into industrial entrepreneurship. However, this framework only provides a static picture and being close to production does not in itself necessitate a move towards greater control of it. The next section therefore explores the forces shaping the speed and direction of movement of merchants across this framework and into entrepreneurship.

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[91] North, 'Von der Atlantischen Handelsexpansion bis zu den Agrarreformen (1450-1815)', 153.
[92] Straubel, *Kaufleute und Manufakturunternehmer*.
[93] Kocka, 'Entrepreneurs and Managers in German Industrialization', 509.
[94] Kocka, 501.

1.5 From Merchant to Entrepreneur: the genesis of the proto-firm

The movement of the merchant to become an industrial entrepreneur can only be fully understood in connection with the simultaneous transition of the pre-modern enterprise to the modern (industrial) firm. Unlike the big medieval merchant houses, merchant enterprises in early modern Germany were almost always directly tied to the person.[95] Between 1750 and 1900 some of these enterprises were subject to an increasing depersonalization and a complex process of evolution which brought about the firm in its modern sense.[96] The words *Unternehmen* (firm) and *Unternehmer* (entrepreneur) emerged first in the early 1800s and only found widespread usage from the 1860s onwards, suggesting that in the meantime the firm emerged and proliferated in Germany.[97] The period between ca.1750 to ca.1850, therefore, becomes the period of the 'proto-firm'. Proto-firms were defined by their hybrid character, sharing characteristics with both the modern firm and the pre-modern enterprise at the same time and thus not falling into either category.[98] They often combined modern features, such as a clear division of labour, a centralized control of the production process, and strategic decision making based on market-oriented thinking, with features of premodern enterprise, namely, a deep integration into the corporate system, a dependence on privileges and state concessions, and a lack of rational capital calculations. [99] Similarly, the term 'proto-factory' has been proposed to describe centralized sites of production which fell between pre-modern workshops and industrial factories.[100] Unlike some definitions of 'proto-industrialization', the term 'proto-

[95] Peter Kriedte, 'Trade', in *Germany 1630-1800*, ed. Robert W. Scribner and Sheilagh Ogilvie, Germany: A New Social and Economic History 2 (London: Arnold, 1996), 110; Schramm, 'Hamburger Kaufleute in der 2. Hälfte des 18. Jahrhunderts', 307.
[96] Ralf Banken, 'Die Entstehung des modernen Unternehmens: Einführende Bemerkungen', *Jahrbuch für Wirtschaftsgeschichte / Economic History Yearbook* 53, no. 2 (December 2012): 9–10.
[97] Wischermann, 'Frühindustrielle Unternehmensgeschichte in Institutionalistischer Perspektive', 458; Stefan Gorißen, 'Vorindustrielle Unternehmer? Ökonomische Akteure und Betriebsformen im 18. und frühen 19. Jahrhundert', *Jahrbuch für Wirtschaftsgeschichte / Economic History Yearbook* 53, no. 2 (1 December 2012): 41; Scherm, 'Kleine und mittelständische Betriebe in unternehmerischen Netzwerken', 65.
[98] Banken, 'Die Entstehung des modernen Unternehmens', 15.
[99] Banken, 15–18; For an example see: Alessandro Monti, 'Moderne Unternehmen in der vorindustriellen Zeit: Das Beispiel der Porzellanmanufaktur Meißen', *Jahrbuch für Wirtschaftsgeschichte / Economic History Yearbook* 53, no. 2 (December 2012): 63–91.
[100] Cerman, 'Proto-Industrialization in an Urban Environment', 286.

firm' does not imply a necessary first phase of the modern firm, but simply describes the various hybrid enterprises that developed and existed between 1750 and 1850.[101] These hybrid proto-firms included enterprises led by 'Verleger-Kaufleute', 'Fabriquen-Kaufleute', and 'Manufaktur-Unternehmer', however, almost never by 'Nur-Kaufleute'.

Generally, merchant enterprises became proto-firms and ultimately modern firms when it was profitable to do so. Firms emerged when the organizational cost of the vertically integration of multiple production steps were lower than the transaction costs of horizontally structured market production by independent producers.[102] Whether a vertically integrated enterprise was more efficient depended on market structure and institutional context it operated in. Particularly guild and corporate institutions fulfilled important transaction cost reducing functions in early modern Germany. Merchant enterprises only transitioned to become firms where these early modern institutions no longer effectively reduced transaction costs in light of changing market forces associated with the gradually increasing integration of supra-regional markets. The relative share of proto-firms in a town's economy is thus inversely related to the private-order strength of corporate institutions.

For this process, the importance of the increasing market integration and European wide regional specialization that started accelerating from the mid-eighteenth century onwards can hardly be overstated. As long-distance export trade expanded, product quality and labour control became increasingly important and decisively spurred merchants to transition intro entrepreneurship. Particularly for more complex, higher quality goods, there existed a substantial incentive for independent producers – both rural and urban – to exploit information asymmetries and provide subquality goods. In early modern Germany, the monitoring of quality in rural industry was often carried out by

[101] For an example of proto-industrialization as 'first phase' of industrialization see: Mendels, 'Proto-Industrialization'.
[102] R. H. Coase, 'The Nature of the Firm', *Economica* 4, no. 16 (1937): 386–405; Wischermann, 'Frühindustrielle Unternehmensgeschichte in Institutionalistischer Perspektive', 453–65.

guilds or guild like institutions.[103] In the Bielefeld area, for example, the state sanctioned *Legge* effectively provided quality control services and thus reduced transaction costs for merchants. As a result of this the *Kaufsystem* persisted, as there did not exist sufficient incentives for merchants to expand their control over the production process.[104] However, once the *Legge* system was abolished, vertically integrated proto-firms rapidly emerged and integrated quality control.[105] Quality control in a proto-firm framework could also enable areas to shift to producing more complex goods. Efforts by the state to organize the production and export of damask in Silesia in the 1740s and 1760s failed largely due to the resistance of merchant guilds whose inefficient quality control institutions made it an unprofitable undertaking. However, when in 1765 the merchant guild monopoly collapsed in the Lusatian towns of Zittau and Löbau, damask production quickly emerged in a putting-out and proto-firm framework.[106] As product quality was often determined by the final steps, rather than the first steps of the production process, merchants often combined the operation of a centralized manufacturing site – a proto-factory – which carried out the capital-intensive finishing steps while rural producers engaged in more labour-intensive first steps of production.[107] Controlling labour directly did not just make quality control easier but also substantially reduced the risk of embezzlement – an inherent problem when relying on a large number of spatially dispersed independent producers.[108] Merchants with greater control over the production process could also adapt their products more precisely and quickly to changing demands in distant export markets.[109] Evidence from Berlin in the 1770s shows

[103] Marcel Boldorf, 'Socio-Economic Institutions and Transaction Costs: Merchant Guilds and Rural Trade in Eighteenth-Century Lower Silesia', *European Review of Economic History* 13, no. 2 (2009): 174.
[104] Wischermann, 'Frühindustrielle Unternehmensgeschichte in Institutionalistischer Perspektive', 464–71.
[105] Gorißen, 'Vorindustrielle Unternehmer? Ökonomische Akteure und Betriebsformen im 18. und frühen 19. Jahrhundert', 58–59; For a similar observation in Silesia see: Boldorf, 'Socio-Economic Institutions and Transaction Costs', 194.
[106] Boldorf, 'Socio-Economic Institutions and Transaction Costs', 189–90, 194; cf. Ogilvie, 'Proto-Industrialization in Germany', 134.
[107] Gorißen, 'Vorindustrielle Unternehmer? Ökonomische Akteure und Betriebsformen im 18. und frühen 19. Jahrhundert', 61.
[108] Cerman, 'Proto-Industrialization in an Urban Environment', 284–85.
[109] Cerman, 286.

that vertically integrated proto-firms had an organizational advantage which enabled faster adaptation to specific demands in export markets and thus made a place's export industries more competitive on an international scale.[110] Old forms of coordinating export-oriented industries were often no longer effective at responding to changing demands in distant markets.[111]

Studying proto-firms and early merchant-entrepreneurs is thus important for the spatial variation of economic activity in nineteenth century Germany, because places with a greater number of proto-firms and of merchants close to the production process had a higher *elasticity of supply of early industrial entrepreneurship*. Jürgen Kocka argued that 'historically and socially conditioned weaknesses of entrepreneurial and managerial resources may delay and hinder – if not prevent – the beginning of an industrialization process'.[112] Such a bottleneck of entrepreneurial capacities emerged where proto-firms were underdeveloped, largely due to the persistent effectiveness of corporate institutions in reducing transaction costs. Without an elastic supply of industrial entrepreneurs, the potential gains from adopting new machinery, adapting products to the needs of export markets, and introducing the production of more complex goods could not materialize.

2. The Source

In 1798, August Schumann, proprietor of a *Materialwarenhandlung* in Ronneburg, former author, and father of the acclaimed composer Robert Schumann, published an exhaustive business directory covering 291 towns across Germany.[113] As a merchant himself he had grown frustrated by the lack of such a unified directory and set out to change this.[114] To assemble the most complete data

[110] Straubel, *Kaufleute und Manufakturunternehmer*, 134.
[111] Kleinschmidt, 'Weltwirtschaft, Staat und Unternehmen im 18. Jahrhundert', 74.
[112] Kocka, 'Entrepreneurs and Managers in German Industrialization', 495.
[113] Rudolf Schmidt, 'Schumann (Zwickau)', in *Deutsche Buchhändler. Deutsche Buchdrucker.*, vol. 5 (Berlin/Eberswalde, 1908), 876–78.
[114] August Schumann, *Versuch eines allgemeinen Handlungs- und Fabrikenaddreßbuches von Deutschland und einigen damit verwandten Provinzen* (Ronneburg und Leipzig: Schummansche Buchhandlung und Joh. Ambr. Barth, 1798), Vorbericht.

possible, Schumann compiled existing business directories and *Messregister* (trade fair registries). He complemented this information by hiring commissionaires for every town included in the directory, which he tasked with collecting letters from enterprises and posting them to Schumann. He further wrote to individual enterprises listed in the *Messregister* asking for further information about their undertakings. All postage was paid for by Schumann, making the entire process free of charge for the enterprises. The resulting directory includes information about the company ("ihre Handelsfirma"), the main nature of business it conducts ("Hauptgegenstände ihrer Beschäftigung"), the fairs it attended ("die Messen, welche von ihr bezogen würden") and its location ("ihre Wohnungen") as well as some general information on the town it was situated in.[115] Schumann himself laments the incompleteness of his directory, calling it a '*Versuch'* (attempt) at a general merchant and manufacturing enterprise directory of German lands. Given the strong variation of the degree of completeness of his directory, Schumann marked all towns where the information he was able to gather was inadequate ("mangelhaft") with an asterisk.[116] Out of the 291 towns in the directory, 58 do not contain an asterisk and thus can be considered have 'complete' information.[117] Figure 1 shows a sample page from a 'complete' town.

As with much early evidence, Schumann's directory must be used with caution. Obtaining reliable information was still a very costly, complex, and long process in the 1790s, and in the collection process a number of distortions may have found their way into his directory. The collection strategy meant that enterprises themselves submitted the information about their own activities, which may have led to enterprises exaggerating their own significance and scale of operations (e.g., by wrongfully claiming to trade *en gros*). Similarly, different commissionaires

[115] The full quote reads: "Ich forderte daher in einem besonderen Schreiben das ganze große Corps deutscher Kaufleute und Fabrikanten auf mit zu diesen Behufe ihre Handelsfirma, die Hauptgegenstände ihrer Beschäftigung, die Messen, welche von ihr bezogen würden, nebst ihren Wohnungen daselbst gefälligst anzuzeigen." Schumann, Vorbericht.
[116] Schumann, Vorbericht.
[117] It is important to note a similar directory which was released in the same year as Schumann's and is also available. However, unlike Schumann's, it is solely concerned with manufacturing enterprises. It also categorizes by good categories, rather than by city. See: Johann Christian Gädicke, *Fabriken- und Manufcaturen-Addreß-Lexicon von Teutschland und einigen angränzenden Ländern* (Weimar: Industrie-Comptoir, 1798).

oversaw the information collection in every town, and they may have had different threshold levels of when an enterprise was significant enough to be included in the directory and when information was deemed inadequate or 'complete'. Furthermore, as the collection process took multiple months to complete and reports from cities arrived at different times – often months apart – there may have been distortions introduced by potential seasonal cycles in bankruptcies and founding of new enterprises.[118] While noteworthy, these distortions are all relatively minor and unlikely to substantially shift the general picture of the relative activity between towns.

The information contained in the directory provides some limitations into the possible insights that can be derived from it. Firstly, it only records merchants whose enterprises were located in towns, which excludes a substantial share of the merchant body. In his 'Markantilitischen Handbuch' from 1809, Johann Ohm recorded a total of 1929 merchants in the duchy of Berg and the county of Mark, of whom 1002 lived in towns and 927 in small rural settlements.[119] Therefore, any insights derived from Schumann's directory cannot be easily generalized for all merchants and enterprises, as rural enterprises may have been subject to different forces than urban ones. A second key limitation is that Schumann's directory provides no precise information of the size of an enterprise and its operations. Thus, there is no way of differentiating between a simple workshop and a large-scale manufacturing enterprise.[120] Figure 2 compares a list of the largest manufacturing businesses in Magdeburg according to Rolf Straubel with their corresponding entries in Schumann's directory. While Straubel's evidence shows that there were substantial differences in size and revenue between these businesses, these differences are not identifiable from the entries in Schumann's directory. In another example, the Bethman family, an important Banking house in Frankfurt, is simply listed as a firm engaged in *'Wechsel., Kommiss. Und*

[118] Schumann, *Versuch eines allgemeinen Handlungs- und Fabrikenaddreßbuches von Deutschland und einigen damit verwandten Provinzen*, Vorbericht.
[119] Gorißen, *Vom Handelshaus zum Unternehmen: Sozialgeschichte der Firma Harkort im Zeitalter der Protoindustrie (1720-1820)*, 376.
[120] For examples of large-scale enterprises during this period see: Wehler, *Deutsche Gesellschaftsgeschichte Bd.1*, 81.

Spediz.' (money exchange, trade on commission and haulage).[121] Schumann's directory, thus, cannot provide any insights into the relative employment shares or revenue shares of different sectors. Importantly, however, these limitations do not significantly detract from the insights that can be gained from Schumann's directory on the comparative *market structure* of towns.

Despite these limitations, Schumann's directory is a powerful source. Its date of publication (1798) makes it the, to my knowledge, earliest available merchant and business directory of its kind. It sheds light on the spatial variation of business and merchant activity prior to the industrialization in Germany, an area still largely a terra incognita. At the present, eighteenth century sources on trade that have been employed in the literature have been limited to import and export declarations from Hamburg, aggregate figures from Bavaria, and evidence from the Cologne crane tax.[122]

While the 58 'complete' towns in Schumann's directory are few in number, they offer a wide variety. Their population sizes vary between Herrnhut (743 inhabitants) to Hamburg (over 100,000 inhabitants) and are dispersed across almost all regions of Germany. As Schumann was located in Ronneburg (in Thuringia), there exists some clustering of 'complete' towns nearby, yet many important and unimportant cities in other regions are included as well. Moreover, the 'complete' towns include the whole range of town types, ranging from free imperial cities (Frankfurt, Mühlhausen, Dünckelbühl etc.), to *Residenzstädte* (Braunschweig, Hannover etc.) to small rural towns (Holzmünden, Calw etc.). Figure 3 shows which of the 25 largest towns in Germany in 1800 are marked as 'complete' in Schumann's directory. While a number of significant towns are missing, these are mostly limited to Berlin, Potsdam and four cities in Bavaria.

[121] For a brief discussion of the transition of the Bethman family from trade into banking see: North, 'Von der Atlantischen Handelsexpansion bis zu den Agrarreformen (1450-1815)', 167.
[122] Pfister, 'The Quantitative Development of Germany's International Trade during the Eighteenth and Early Nineteenth Centuries', 177; Newman, 'Anglo-Hamburg Trade in the Late Seventeenth and Early Eighteenth Centuries'.

The density of observations in Schumann's directory appears to be roughly in line with the few existing observations. One estimate asserts that in 1800, there were ca. 2-2.5 *Kaufleute mit breitem Sortiment* and 1.5-2.5 *Händler spezialisiert auf einzelne Waren oder Warengruppen* per 1000 capita in Germany.[123] Evidence from Bavaria in the 1770s suggests there to have been ca. 2 *Händler und Krämer* (merchants and peddlers) per 1000 capita. [124] These numbers appear to be roughly in line with the 8.84 observations per 1000 capita across the 'complete' towns in Schumann's directory. The Schumann number is naturally higher, as it is limited to towns, where there was likely a greater density of merchants, and as it includes manufacturing enterprises as well. Another observation asserted that there were around 300 merchant houses in Frankfurt am Main in 1776, while Schumann's directory lists 425 observations of merchant and manufacturing enterprises in 1798.[125]

2.1 From Source to Dataset

Given its unique position as international trading hub and its population size, which was a multiple of other 'complete' towns in Schumann's directory, Hamburg was subject to very different pressures than other cities. In the words of Charles Kindleberger, it 'built a tradition of being an English, rather than a German city' as it bore much more similarities to the Atlantic port-cities of England than to the towns of the German hinterland.[126] Therefore, both Hamburg and the Danish-ruled quasi-suburb of Altona are excluded. The remaining 56 'complete' towns form the basis of the present dissertation.

To construct a digitized dataset from Schumann's directory, for every enterprise all information on it name, the business it conducts, and the fairs it attended was manually transcribed, resulting in 6099 unique observations. For each enterprise,

[123] Friedrich-Wilhelm Henning, *Das vorindustrielle Deutschland 800 bis 1800*, UTB 398 (Paderborn: Schöningh, 1974), 272.
[124] Kriedte, 'Vom Großhändler zum Detaillisten. Der Handel mit "Kolonialwaren" im 17. und 18. Jahrhundert', 32–33.
[125] Kindleberger, 'Commercial Expansion and the Industrial Revolution', 642.
[126] Pfister, 'Great Divergence, Consumer Revolution and the Reorganization of Textile Markets: Evidence from Hamburg's Import Trade, Eighteenth Century', 3–10; Kindleberger, 'Germany's Overtaking of England, 1806 — 1914', 258.

its features were coded across 258 binary categories to enable cross-comparison between enterprises. For example, the entry "*Blume, Chr. Ludw., Gewürz, Mater. W., Spediz. und Kommiss.*" from Braunschweig falls into four categories: (1) trading in spices, (2) trading in *materialwaren*, (3) engaging in *Speditionshandel* and (4) engaging in *Kommissionshandel*. Similarly, the entry "*Degener, J. Fr. Wolle und Fabr. In Zichorienkaffee"* also from Braunschweig falls into the categories: (1) trading in *Wolle*, (2) engaging in manufacturing ("Fabr."), and (3) conducting business with *Zichorienkaffee*. These 258 categories capture the vast majority of information contained in the entries, spanning from information on the goods it trades in, to the nature of business it conducts, to its form of organization, to the trade fairs it attended. Scoring all 6099 enterprises across these categories yields 16491 unique datapoints, in addition to the information on which town an entry is located in. Utilizing these categories, I construct summary statistics for all 56 towns in my dataset, and, where appropriate, create additional macro categories. For example, the categories 'wine', 'beer', and 'liquor' were summarized as 'alcoholic beverages'. Appendix 2 provides a sample of seven of the 258 town-level summary statistics.

2.2 Methodology and Research Design

The main objective of this part is to understand how the qualitative and quantitative features of a town's pre-industrial merchant corps impact its industrialization experience and whether such differences may help explain the spatial variation in growth experiences during the German industrialization. Of particular interest is the role of differences in the merchant community in causing different elasticities of supply of industrial entrepreneurship and in influencing early industrial enterprise formation. Using the new dataset from Schumann's directory, this paper runs three multivariate OLS regressions that seek to explain the variation in growth experiences across the towns in the dataset.

As the dependent variables, I employ population growth rates from 1798 to 1850, 1875 and 1900. Urban population growth serves as (an admittedly imperfect) proxy for economic growth as is common in studies of the pre-industrial

economy.[127] The primary source for population data is the *Deutsches Städtebuch,* a multi-volume compendium of historic characteristics of cities and towns in Germany.[128] For Basel, which is not part of the Städtebuch, population data comes from the *Statistisches Jahrbuch des Kanton Basel-Stadt*, the official statistical records of the local administration on historic population growth.[129] In select cases in which the Städtebuch data around 1800 was lacking, it was complemented utilizing a population table compiled by Ulrich Pfister.[130] The observations for individual towns were then standardized by inferring the population for the years 1798, 1815, 1830, 1850, 1875 and 1900 based on the closest two datapoints. Where the nearest population observation was more than 20 years from one of these dates, no population was inferred. For Löbau, for example, the earliest available datapoint ware from 1834 and 1864, thus no reliable information on its population in 1798 could be inferred. For Gotha and Herrnhut neither the Städtebuch nor the supplementary population data sources offer reliable population figures for the later part of the 19th century, thus information for them is only available until 1850. Furthermore, for the villages of Gnadau, Rötgen, Gränzdorf, Reichenau (near Zittau), and Schwerta no sources on historical population data were available, as these were too small to be included in the Städtebuch. Thus, the number of towns was reduced to 49 (for 1850 and before) and 47 (thereafter). Appendix 1 provides the population dataset. Given the increasing differences in population growth rates over time, the later regressions generally have larger coefficients and more statistically significant findings. The regression using

[127] Keller and Shiue, 'Market Integration as a Mechanism of Growth'; Cantoni, Dittmar, and Yuchtman, 'Religious Competition and Reallocation'; Cantoni, 'The Economic Effects of the Protestant Reformation'; Dittmar and Meisenzahl, 'Public Goods Institutions, Human Capital, and Growth'; Jeremiah E. Dittmar, 'Information Technology and Economic Change: The Impact of the Printing Press', *The Quarterly Journal of Economics* 126, no. 3 (2011): 1133–72; Noel D. Johnson and Mark Koyama, 'Jewish Communities and City Growth in Preindustrial Europe', *Journal of Development Economics* 127 (2017): 339–54; David Stasavage, 'Was Weber Right? The Role of Urban Autonomy in Europe's Rise', *The American Political Science Review* 108, no. 2 (2014): 337–54.

[128] Erich Keyser et al., eds., *Deutsches Städtebuch: Handbuch städtischer Geschichte*, vol. 1–5 (Stuttgart u.a.: Kohlhammer, 1939).

[129] *Statistisches Jahrbuch des Kantons Basel-Stadt: Zeit und Raum in Zahlen* (Basel: Präsidialdepartment des Kantons Basel-Stadt: Statistiches Amt, 2020).

[130] Ulrich Pfister, 'Urban Population in Germany, 1500 - 1850', CQE Working Papers (Center for Quantitative Economics (CQE), University of Muenster, April 2020), 32–51.

population growth until 1830 as dependent variable has been excluded due to the small variation in the outcome variable making the results largely meaningless.

The *Deutsches Städtebuch* has multiple advantages over the city population data by Bairoch et al. which is the most-used source of urban population data in research on pre-industrial European towns.[131] Firstly, while Bairoch et al.'s data is limited to towns greater than 5000 inhabitants, the Städtebuch covers a much larger range of town sizes, and thus allows studying the 30 towns smaller than 5000 inhabitants that are contained in present dataset. Furthermore, it is likely that it is a more accurate source, as it is based on a multi-decade effort of numerous local historians which actively consulted town archives. Bairoch et al.'s data, on the other hand, is much less finely grained, having constructed information for towns across all of Europe between 800 and 1850 for every 50 or 100 years. For nineteenth century Germany, the *Deutsches Städtebuch* is likely the most comprehensive, uniform, accurate source on town sizes available.

Three groups of independent variables are included. The first, represents the existing theories discussed in the literature survey. To measure the potential impact of the French occupation, I introduce a *French Treatment* variable, which indicates the number of years that a town was occupied by the French. This instrument was used by both ACJR and Keller and Shiue.[132] The *French Treatment* values correspond to the values assigned that ACJR assigned to the polities in which the towns are located. To indicate the degree of *proto-industrialization in textiles*, I include a measure of a town's share of enterprises trading in or manufacturing textiles, as indicated by Schumann's directory. Textile industries were at the heart of proto-industry and the theory surrounding it.[133] The degree to which a town is dependent on export of textiles is thus indicative of the degree of proto-industrialization within said town. If proto-

[131] Paul Bairoch, Jean Batou, and Pierre Chèvre, *La population des villes européennes: banque de données et analyse sommaire des résultats; 800 - 1850*, Publications d'histoire économique et sociale internationale (Genève: Droz, 1988).
[132] Acemoglu et al., 'The Consequences of Radical Reform'; Keller and Shiue, 'Market Integration as a Mechanism of Growth'.
[133] Coleman, 'Proto-Industrialization', 436–38.

industrialization in textiles or French occupation were key drivers of regional variation in economic development across the nineteenth century we would expect these variables to yield clearly positive associations with population growth.

The second group investigates the role of early industrial entrepreneurship and the determinants of different levels in its elasticity of supply. If the supply of early industrial entrepreneurs solely depended on the *quantity* of business activity prior to the onset of industrialization, we would expect a significant association between the *Enterprises per Capita* and subsequent growth pattern in the nineteenth century. We would also expect such an association, if nineteenth century economic activity was simply a path dependent result of the pre-industrial level of economic activity. Another potential driver of early firm formation is the pre-industrial level of *Manufacturing per Capita*. If the bottleneck of early industrial firm formation was the degree of technical skill and the number of craftsmen, then a clear association between per capita manufacturing enterprises and the subsequent urban growth would be found. A third variable in this group represents the number of *Proto-Firms* as indicated by the share of partnerships of the total enterprises within a town. A close correlation between being a partnership and being a proto-firm can be observed from the local evidence gathered by Rolf Straubel, thus making it a strong instrument for the level of proto-firms.[134] Finally, a set of variables is included to indicate the levels of *'Nur-Kaufleute'*. This includes per capita measurements of *Kommissionshändler* and *Speditionshändler*. Note that many merchants engaging in one of the two categories did so while simultaneously trading on their own account. While rare cases in which merchants exclusively operated on commission did exist, the measurements included do not differentiate between whether a merchant carried out trade on commission exclusively or on the side. This set of variables also includes a measurement for *Generalists* (unspecialized merchants). The increasing intensification of trade in the eighteenth century saw a specialization of merchants from the *Gebietskaufmann*, who specialized in a region, to the *Branchenkaufmann*, who

[134] Straubel, *Kaufleute und Manufakturunternehmer*.

specialized in a certain range of goods.[135] This process was a precursor to the transition of merchants into entrepreneurship, as it provided them with greater understanding of specific products and the demands in export markets for them. A larger share of non-specialized enterprises in the town's economy as a whole may be indicative of a town having experienced this transition to a lesser degree.

The third group of variables introduces controls for other factors that have been shown to influence urban growth. The per capita density of *Bookshops* indicates variations in mid-level human capital and book consumption. For pre-industrial Europe book consumption has been found to be associated with growth in real wages and, similarly, a link has been found between the early adoption of printing with subsequent city growth.[136] Furthermore, for upper-tail human capital – as opposed to simple literacy rates – a link between eighteenth century spatial variations and town growth during the industrialization has been found for France and, for Germany, studies have established a persistent effect of pre-industrial advantages in schooling and human capital levels on subsequent growth rates.[137] As the density of bookshops can be considered a function of the consumption of books and, therefore, of mid-level human capital and the integration of a town into the wider markets for knowledge, the *Bookshops* variable allows to control for most effects of different levels of human capital between towns.

A second dimension that this model controls for is that of the regional context within which a town is located. Economic historians of Germany have identified a set of regions whose polities share certain characteristics in their agrarian commercialization, general institutions, and demographic-economic regime. To

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[135] Banken, 'Die Entstehung des modernen Unternehmens', 19; Gorißen, *Vom Handelshaus zum Unternehmen: Sozialgeschichte der Firma Harkort im Zeitalter der Protoindustrie (1720-1820)*, 365.

[136] Joerg Baten and Jan Luiten van Zanden, 'Book Production and the Onset of Modern Economic Growth', *Journal of Economic Growth* 13, no. 3 (2008): 217–35; Dittmar, 'Information Technology and Economic Change: The Impact of the Printing Press'.

[137] Mara P. Squicciarini and Nico Voigtländer, 'Human Capital and Industrialization: Evidence from the Age of Enlightenment', *The Quarterly Journal of Economics* 130, no. 4 (November 2015): 1825–83; Becker and Woessmann, 'Was Weber Wrong? A Human Capital Theory of Protestant Economic History'; Dittmar and Meisenzahl, 'Public Goods Institutions, Human Capital, and Growth'.

control for the regional context that a town is located in, I introduce four dummy variables that, based on the regional framework used by Bromley and Kopsidis, indicate which region a town belongs to.[138] Figure 4 shows a precise breakdown of the regions, their characteristics, and which locations are included in them. Further, Figure 5 indicates which towns were assigned to which region.

Two more dimensions are controlled for in this model. To control for factors of natural geography and market access, I include dummy variables for whether a town is located on a navigable river or is an ocean port.[139] Authors have also emphasized the political function of towns. Free cities have been argued by some historians to have been a more conducive environment for economic development, as their participative institutions may have made them more receptive for republican ideas and thus the emergence of a capitalist system.[140] Others, have argued that they were oligarchies dominated by rent-seeking patrician elites, which may have been republican but not democratic.[141] Which of these was the case may have varied across time, as local participative institutions and greater autonomy at town level have been found to have had a positive effect on growth for a limited amount of time.[142] Regardless of direction of effect, I introduce a dummy variable to control for any potential role of free city status. Finally, for the 1800-1850 period it has been documented that capitals of independent polities and Prussian provinces grew substantially faster than other towns.[143] For this reason, I also introduce a dummy to control whether a town was a capital after the Napoleonic wars or not.

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[138] Kopsidis and Bromley, 'The French Revolution and German Industrialization: Dubious Models and Doubtful Causality', 181.
[139] On nineteenth century market integration processes, see: Wolfgang Keller and Carol H. Shiue, 'Endogenous Formation of Free Trade Agreements: Evidence from the Zollverein's Impact on Market Integration', *The Journal of Economic History* 74, no. 4 (2014): 1168–1204.
[140] Hartmut Zückert, 'Die wirtschaftliche und politische Funktion der süddeutschen Reichsstädte im 18. Jahrhundert', in *Gewerbe und Handel vor der Industrialisierung. Regionale und überregionale Verflechtungen im 17. und 18. Jahrhundert*, ed. Joachim Jahn and Wolfgang Hartung, Regio Historica (Sigmaringendorf: Glock und Lutz, 1991), 68–69.
[141] Kindleberger, 'Commercial Expansion and the Industrial Revolution', 617.
[142] Fabian Wahl, 'Political Participation and Economic Development. Evidence from the Rise of Participative Political Institutions in the Late Medieval German Lands', *European Review of Economic History* 23, no. 2 (1 May 2019): 193–213; Stasavage, 'Was Weber Right?'
[143] Pfister, 'Gewalt, institutionelle Schocks und Entwicklung: Wirtschaftliche Folgen der Koalitions- und napoleonischen Kriege (1792-1815) in Deutschland', 38–39.

Despite introducing these control variables, the regression model may still be subject to some omitted variable bias. Firstly, the role of religious minorities and of Protestantism in inducing city growth in pre-industrial and nineteenth century Germany and Europe has been noted by a number of econometric studies.[144] The majority of this literature finds that religious minorities influenced city growth through the channel of human capital. While my model does not include a measurement of the significance of Protestant or Jewish communities, I include a measurement which looks at the relative density of *Bookshops* per capita and thus the demand for books. Therefore, a substantial part of the role of minority communities can be assumed to be captured in this variable.

A second potential problem may be the lack of measure for coal deposits and extraction. Coal is often invoked as a crucial determinant for the spatial variation of economic activity, and it has been found that proximity to coalfields was associated with city growth after 1750.[145] In nineteenth century Germany, the most important coal and lignite deposits were spatially concentrated in the West and around greater Saxony. By 1900, only three areas had become major coal-producers: Mark, Rhineland, and Silesia.[146] This spatial concentration means that the effect of coal is roughly captured by the four regional controls. Towns in the Early-Industrializer group were closest to these territories, while towns in East Elbia were also closer the Silesian coal production. The remaining two regions in the north and south were comparatively far from these coal deposits. Therefore, some of the effect of coal proximity is captured by the regional control dummies.

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[144] Johnson and Koyama, 'Jewish Communities and City Growth in Preindustrial Europe'; Hornung, 'Immigration and the Diffusion of Technology'; Cantoni, 'The Economic Effects of the Protestant Reformation'; Becker and Woessmann, 'Was Weber Wrong? A Human Capital Theory of Protestant Economic History'.

[145] Fernihough and O'Rourke, 'Coal and the European Industrial Revolution'; For the pre-industrial period, this relationship may have actually been the reverse. Florian Ploeckl finds a negative effect of coal access for Saxon settlements between 1550-1834. Florian Ploeckl, 'Endowments and Market Access; the Size of Towns in Historical Perspective: Saxony, 1550–1834', *Regional Science and Urban Economics* 42, no. 4 (July 2012): 607–18.

[146] Kopsidis and Bromley, 'The French Revolution and German Industrialization: Dubious Models and Doubtful Causality', 179–80.

Finally, this model does not incorporate railways and more detailed variables of market integration. Already around 1800 there existed 'a clear South-North gradient and also a no less noticeable West-East gradient' in the German road network.[147] Starting in the 1830s, the construction of railways added an additional dimension of complexity. In traditional accounts of the German industrialization experience railroad building and the heavy industries associated with it feature prominently as their growth in the nineteenth century was associated with substantial backward linkages and market integration.[148] A study of Prussian urban growth after 1840 has observed the positive effect of access to the railway network on urban development.[149] Some of the early variations in railway access between towns may be captured by the *Capital* (1820) dummy, as administrative centres were often of central importance in early railway networks. Indeed, early long-distance railways in Germany predominately were centred around capitals, examples include the Leipzig-Dresden line (1837), the Magdeburg-Leipzig (1840), or the Cologne-Herbesthal-Antwerp line (1843). However, this effect is likely to have become less important as the railway system expanded across the nineteenth century. Hence, this can only account for a part of the role of railways, and some of their potentially confounding influence remains unaccounted for.

2.3 Findings and Implications

Figure 6 shows the regression results using the population growth rates until 1850, 1875 and 1900 as dependent variables. Across all three regressions neither the *French treatment* not the level of *textiles* is associated with urban growth in any significant way. Even if one disregards statistical significance due to the relatively small sample size, the coefficients are neither large nor uniformly in one

[147] Kriedte, 'Trade', 102.
[148] Tilly, 'Cliometrics in Germany', 22; Nikolaus Wolf, 'Regional Economic Growth in Germany, 1895-2010', in *The Economic Development of Europe's Regions: A Quantitative History Since 1900*, ed. Nikolaus Wolf and Joan Ramón Rosés, Routledge Explorations in Economic History (London; New York: Taylor & Francis Group, 2018), 152–53; Rainer Fremdling, 'Railroads and German Economic Growth: A Leading Sector Analysis with a Comparison to the United States and Great Britain', *The Journal of Economic History* 37, no. 3 (1977): 583–604.
[149] Erik Hornung, 'Railroads and Growth in Prussia', *Journal of the European Economic Association* 13, no. 4 (1 August 2015): 699–736; For a similar study of Wurttemberg see: Sebastian Till Braun and Richard Franke, 'Railways, Growth, and Industrialisation in a Developing German Economy, 1829-1910', *MPRA Paper* No. 93644 (3 May 2019).

direction across the three regressions.[150] While absence of evidence must not be mistaken for evidence of absence, these results strongly call into the question both the 'implanted institutions' and traditional 'proto-industrialization' theories.

The key finding of this analysis is that *proto-firms* matter. The measurement of proto-firms in 1798 is the single most significant and consistent predictor of urban growth in this sample of towns, which suggests that early industrial firms were more likely to develop in places with a proto-firm legacy. The effect is particularly strong for the earlier phases of population growth (1850, 1875), suggesting that the elasticity of supply of industrial entrepreneurship was particularly important during the early stages of industrialization. Additionally, the persistence of significant and large coefficients across all three regressions may be indicative of a path dependence industrialization experience in which towns who were the location of early industrial firms saw the emergence of industrial clusters or the formation of firms by former employees of early industrial firms. Other potential drivers of early firm formation in the form of general *Enterprises per Capita* and the density of *Manufacturing Enterprises* appear to have had no significant association with subsequent growth. If industrial growth were predominantly dependent on the scale of pre-industrial economic activity, we would expect such an association to be present. This suggests that it is not the quantity of a town's pre-industrial enterprises, but rather the qualitative nature of its pre-industrial urban economy that determined growth experiences subsequently.

The role of the 'Nur-Kaufleute' appears to have been an ambiguous one. For the share of *Generalists,* no significant relationship can be established. The results for the role of *Kommissionshandel*, which was predominantly located in large marketplaces, may be indicative of the wider lack of merchant-entrepreneurship in these towns. It may corroborate the low incentive of 'Nur-Kaufleute' to take the risks associated with moving into industrial entrepreneurship as their trade

[150] For a critique of the use of statistical significance in much existing literature see: Stephen Thomas Ziliak and Deirdre N. McCloskey, *The Cult of Statistical Significance: How the Standard Error Costs Us Jobs, Justice, and Lives*, Economics, Cognition, and Society (Ann Arbor: University of Michigan Press, 2008).

business remained profitable and abundant despite the ongoing industrialization.[151] The reverse effect that can be observed for *Speditionshandel*, however, paints a much more complex picture. As *Speditionshandel* was often carried out on the side and located in towns along major trade routes, this finding might be indicative of different levels of market access. While in both cases the coefficients remain relatively small vis-à-vis other factors, these findings do indicate that much more research into *Kommissionshandel* and *Speditionshandel* is needed.

It is worth noting that the results of the control variables generally confirm the assumptions of the model. In line with traditional accounts of the German industrialization which emphasize the increasing importance of technical education and human capital in the German industrialization during last quarter of the nineteenth century, the positive impact of a higher density of *Bookshops* becomes increasingly important towards the end of the century.[152]

Conclusion

This dissertation has made two contributions. First, it has conceptually challenged the oversimplistic portrayal of merchants as a monolithic social group from which capitalists naturally sprang when they accumulated sufficient capital. Instead, it has offered a more nuanced understanding of the types of merchants in Germany around 1800, their different economic functions and who exactly had the greatest potential to transition into entrepreneurship. Furthermore, it has provided a framework to understanding why and when merchants became entrepreneurs. Specifically, it has argued that in eighteenth century Germany an increasing market integration caused some merchants to shift from trading as generalists to trading in a specialized range of goods and gravitate towards the proliferating rural export industries. Spurred by the gains to be made from servicing the specific

[151] Gorißen, *Vom Handelshaus zum Unternehmen: Sozialgeschichte der Firma Harkort im Zeitalter der Protoindustrie (1720-1820)*, 381–82.
[152] Peter Lundgreen, 'Industrialization and the Educational Formation of Manpower in Germany', *Journal of Social History* 9, no. 1 (October 1975): 78.

demands of export markets, merchants close to the production process had a high incentive to control the quality of the products they exported. Where corporate institutions failed to effectively reduce transaction costs and ensure quality control, merchants established proto-firms which vertically integrated multiple production steps and permitted them to quickly adapt to the specific demands in supra-regional export markets. By the end of the eighteenth century, the degree to which proto-firms had emerged, and thus the degree to which merchants had begun transitioning into entrepreneurship, varied substantially across space.

Second, this dissertation has introduced a new database of merchants and proto-firms, which has allowed the earliest supra-regional quantitative study of German merchants to date. Based on comprehensive evidence on the business structure in 56 towns in 1798, this dissertation has tested a set of potential drivers of the economic development of these towns during the industrialization. It found that a greater share of proto-firms in 1798 was strongly associated with greater subsequent growth, particularly for the early phases of the industrialization. It did not find any evidence of effects predicted by some contended theories, most notably the 'implanted institutions' theory by ACJR. These findings indicate that towns with a greater share of proto-firms had advantages in private-order institutions and enterprise organization, which enabled them to become early adopters of industrial production leading to persistent positive outcomes across the nineteenth century.

Data Sources

1. Main Source (Schumann's directory)

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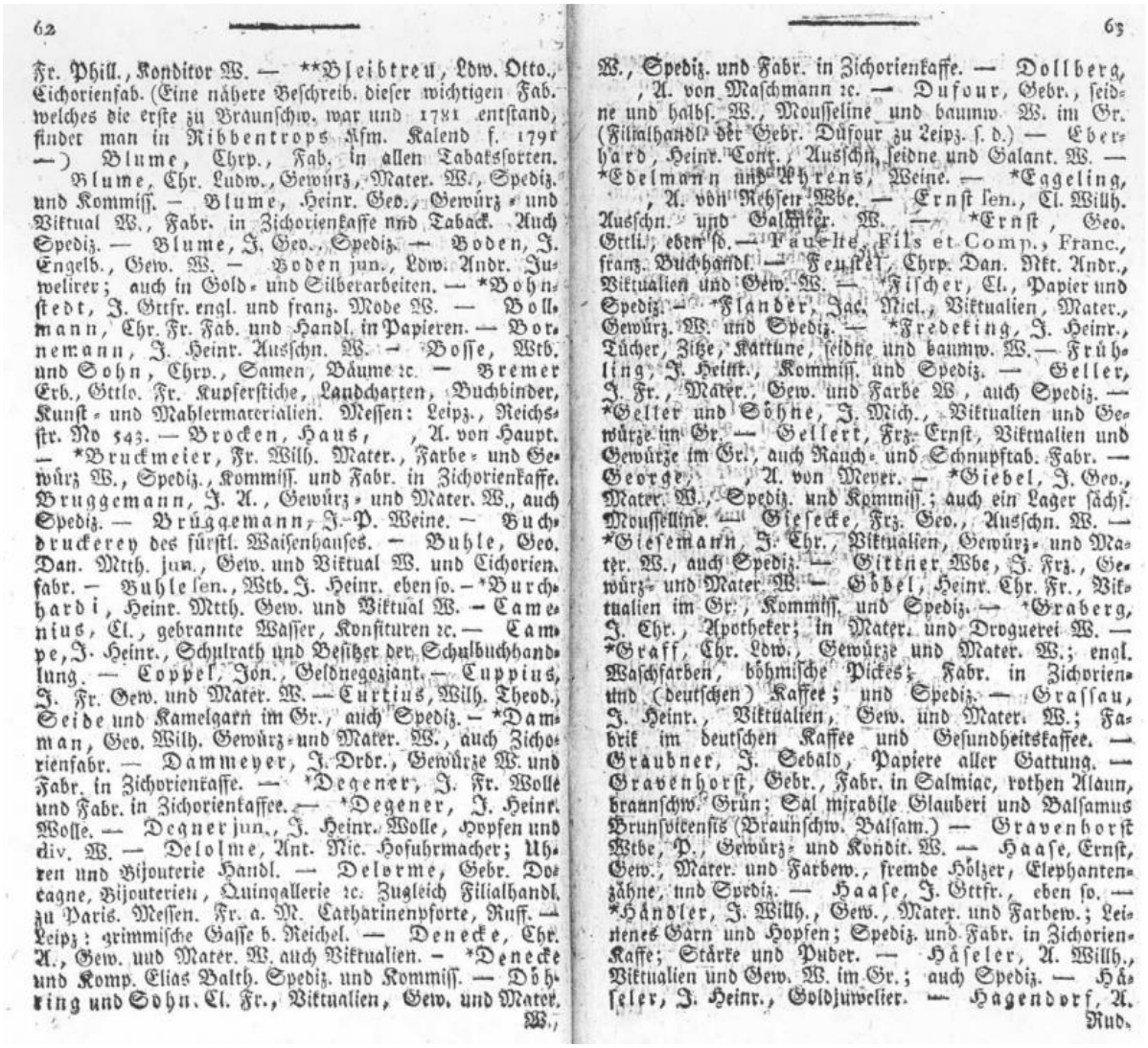
Figures

Figure 1: August Schumann's Directory (Example from Braunschweig, letters B to H)



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Fr. Phill., Konditor W. — **Bleibtreu, Ldw. Otto., Cichorienfab. (Eine nähere Beschreib. dieser wichtigen Fab. welches die erste zu Braunschw. war und 1781 entstand, findet man in Ribbentrops Rfm. Kalend f. 1791 —) Blume, Chrp., Fab. in allen Tabaksorten. Blume, Chr. Ludw., Gewürz, Mater. W., Spediz. und Kommiss. — Blume, Heinr. Geo., Gewürz- und Viktual W., Fabr. in Zichorienkaffe und Taback. Auch Spediz. — Blume, J. Geo., Spediz. — Boden, J. Engelb., Gew. W. — Boden jun., Ldw. Andr. Juwelirer; auch in Gold- und Silberarbeiten. — *Bohnstedt, J. Gttfr. engl. und franz. Mode W. — Bollmann, Chr. Fr. Fab. und Handl. in Papieren. — Bornemann, J. Heinr. Ausschn. W. — Bosse, Wtb. und Sohn, Chrp., Samen, Bäume ꝛc. — Bremer Erb., Gttlo. Fr. Kupferstiche, Landcharten, Buchbinder, Kunst- und Mahlermaterialien. Messen: Leipz., Reichsstr. No 543. — Brocken, Haus, , A. von Haupt. — *Bruckmeier, Fr. Willh. Mater., Farbe- und Gewürz W., Spediz., Kommiss. und Fabr. in Zichorienkaffe. Bruggemann, J. A., Gewürz- und Mater. W., auch Spediz. — Brüggemann, J. P. Weine. — Buchdruckerey des fürstl. Waisenhauses. — Buhle, Geo. Dan. Mtth. jun., Gew. und Viktual W. und Cichorienfabr. — Buhle sen., Wtb. J. Heinr. ebenso. — *Burchhardi, Heinr. Mtth. Gew. und Viktual W. — Camenius, Cl., gebrannte Wasser, Konfituren ꝛc. — Campe, J. Heinr., Schulrath und Besitzer der Schulbuchhandlung. — Coppel, Jon., Geldnegoziant. — Cuppius, J. Fr. Gew. und Mater. W. — Curtius, Willh. Theod., Seide und Kamelgarn im Gr., auch Spediz. — *Damman, Geo. Willh. Gewürz- und Mater. W., auch Zichorienfabr. — Dammeyer, J. Drdr., Gewürze W. und Fabr. in Zichorienkaffe. — *Degener, J. Fr. Wolle und Fabr. in Zichorienkaffee. — *Degener, J. Heinr. Wolle. — Degner jun., J. Heinr. Wolle, Hopfen und div. W. — Delolme, Ant. Nic. Hofuhrmacher; Uhren und Bijouterie Handl. — Delorme, Gebr. Docagne, Bijouterien, Quincallerie ꝛc. Zugleich Filialhandl. zu Paris. Messen. Fr. a. M. Catharinenpforte, Ruff. — Leipz: grimmische Gasse b. Reichel. — Denecke, Chr. A., Gew. und Mater. W. auch Viktualien. — *Denecke und Komp. Elias Balth. Spediz. und Kommiss. — Döhring und Sohn, Cl. Fr., Viktualien, Gew. und Mater. W.,

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W., Spediz. und Fabr. in Zichorienkaffe. — Dollberg, , A. von Maschmann ꝛc. — Dufour, Gebr., seidne und halbs. W., Mousseline und baumw. W. im Gr. (Filialhandl. der Gebr. Dufour zu Leipz. s. d.) — Eberhard, Heinr. Conr., Ausschn, seidne und Galant. W. — *Edelmann und Ahrens, Weine. — *Eageling, , A. von Mehsen Wbe. — Ernst sen., Cl. Willh. Ausschn. und Galanter. W. — *Ernst, Geo. Gttli., eben so. — Faucite, Fils et Comp., Franc., franz. Buchhandl. — Feustel, Chrp. Dan. Mkt. Andr., Viktualien und Gew. W. — *Fischer, Cl., Papier und Spediz. — *Flander, Jac. Nicl., Viktualien, Mater., Gewürz. W. und Spediz. — *Fredeking, J. Heinr., Tücher, Zitze, Kattune, seidne und baumw. W. — Frühling, J. Heinr., Kommiss. und Spediz. — Geller, J. Fr., Mater., Gew. und Farbe W, auch Spediz. — *Gelter und Söhne, J. Mich., Viktualien und Gewürze im Gr. — Gellert, Frz. Ernst, Viktualien und Gewürze im Gr., auch Rauch- und Schnupftab. Fabr. — George, , A. von Meyer. — *Giebel, J. Geo., Mater. W., Spediz. und Kommiss.; auch ein Lager sächs. Mousselline. — Giesecke, Frz. Geo., Ausschn. W. — *Giesemann, J. Chr., Viktualien, Gewürz- und Mater. W., auch Spediz. — Gittner Wbe, J. Frz., Gewürz- und Mater. W. — Göbel, Heinr. Chr. Fr., Viktualien im Gr., Kommiss. und Spediz. — *Graberg, J. Chr., Apotheker; in Mater. und Droguerei W. — *Graff, Chr. Ldw., Gewürze und Mater. W.; engl. Waschfarben, böhmische Pickes; Fabr. in Zichorien- und (deutschen) Kaffee; und Spediz. — Grassau, J. Heinr., Viktualien, Gew. und Mater. W.; Fabrik im deutschen Kaffee und Gesundheitskaffee. — Graubner, J. Sebald, Papiere aller Gattung. — Gravenhorst, Gebr., Fabr. in Salmiac, rothen Alaun, braunschw. Grün; Sal mirabile Glauberi und Balsamus Brunsvicensis (Braunschw. Balsam.) — Gravenhorst Wtbe, P., Gewürz- und Kondit. W. — Haase, Ernst, Gew., Mater. und Farbew., fremde Hölzer, Elephantenzähne, und Spediz. — Haase, J. Gttfr., eben so. — *Händler, J. Willh., Gew., Mater. und Farbew.; Leinenes Garn und Hopfen; Spediz. und Fabr. in Zichorien-Kaffe; Stärke und Puder. — Häseler, A. Willh., Viktualien und Gew. W. im Gr.; auch Spediz. — Häseler, J. Heinr., Goldjuwelier. — Hagendorf, A. Rud.

Figure 2: Largest manufacturing enterprises in Magdeburg around 1800

Straubel (1800)				August Schumann (1797/8)		
Firm Name	**Sector**	**Workers/ Spindles**	**Output in T.**	**Firm Name**	**Description**	**Fairs attended**
G. Wieler & Sohn	Seidenband	140	106,000	Wieler & Sohn	Fabr. In seidnen halblein. und sammetbändern	Frankfurt/Oder, Leipzig
Sultzer & Co.	Seidenband	80	77,700	Sulzer & Komp	Fabr. In seidnen und frieselerbändern	Frankfurt/Oder
Maquet & L'Hermet	Seidenstrümpfe	126	42,000	Maquet & L'Hermet	Fabr. In seidnen und floretseidnen strümpfen	Frankfurt/Oder
J.J. Schwartz & Co.	Wollband	122	82,500	Schwartz & Söhne	Fabrikanten in leinenen Bändern	Frankfurt/Oder
Coqui & Co.	Zucker	10	73,500	Coqui & Comp.	Fabrikanten	
Cuny & Bonte	Seife	13	52,200	Cuny & Bonte	Mater. Und farbewaaren (en gr.); Fabr. In grüner Seife	
Jordan	Lederhandschuhe	54	4,290	Jordan	Wollne waaren	Frankfurt/Oder, Leipzig
Nathusius	Tabak	300	378,000	Nathasius & komp.	Mater. und farbewaaren (en gr.)	
E.J. Schwartz	Tabak	48	59,311	Schwartz & komp.	Mater. und farbewaaren (en gr.); Tabacksfabr.	
W. Placke	Zichorien	130	16,200	Plaacke	Zichorienfab.	
Gebr. Bodenstein	Zichorien	120	11,700	Bodenstein	Zichorienfabr.	

Source: Straubel, *Kaufleute und Manufakturunternehmer*, 158. (Table XVII) and own data.

Figure 3: 25 largest cities in Germany in 1800

City	Population (Bairoch)	'complete' town (Schumann)
Berlin	172,000	No
Hamburg	130,000	Yes
Dresden	60,000	Yes
Frankfurt Am Main	48,000	Yes
Köln	41,000	Yes
München	40,000	No
Bremen	36,000	Yes
Magdeburg	36,000	Yes
Augsburg	30,000	No
Braunschweig	30,000	Yes
Leipzig	30,000	Yes
Nürnberg	30,000	Yes
Mainz	28,000	No
Potsdam	27,000	No
Lübeck	25,000	Yes
Aachen	24,000	Yes
Altona	23,000	Yes
Mannheim	23,000	No
Regensburg	23,000	No
Düsseldorf	20,000	Yes
Halle	20,000	Yes
Stuttgart	20,000	Yes
Würzburg	20,000	No
Elberfeld	19,000	No
Kassel	18,000	No

Population data from: Bairoch et al., *La population des villes européennes*.

Figure 4: Economic Groupings (Regions) based on shared pre-1850 characteristics

Region	Pre-1850 Characteristics	Polities	Towns
Early Industrializers	Centre of old and new industrialization; industrialization was concentrated in a very few areas: high population growth & low share of agriculture; liberal pre-reform agrarian institutions	Rhineland, Mark, Saxony	21
East Elbia	High potential for agricultural growth; radical reforms abolished very restrictive manorial system: high population growth & high share of agriculture; reforms changed the demographic-economic regime; early market-driven agricultural boom largely driven by exports to the UK.	Saxony (Province), Pomerania, Silesia, Brandenburg, East Prussia, Mecklenburg-Schwerin	15
Northwest Region	High potential for agricultural growth; manorial system was still liberal: low population growth & high share of agriculture; reforms did NOT change the demographic-economic regime; major agricultural boom after 1840 to feed the growing heavy industry in western Germany.	Westphalia, Brunswick, Hanover, Schleswig-Holstein	7
South-Southwest Region	Low population growth and high share of agriculture: region slipped into a long-lasting stagnation that did not end until around 1860.	Palatinate, Wuerttemberg, Baden, Bavaria, Hessen-Darmstadt, Hessen-Kassel	10

Source: Bromley and Kopsidis, 'The French Revolution and German Industrialization', 181.

Figure 5: 'Complete' towns in Schumann's directory with corresponding economic grouping

Group	Towns included
Unclassified cities	Lübeck, Bremen, Basel
Early Industrializers	Gotha, Bautzen, Dresden, Meissen, Zittau, Loebau, Annaberg, Gera, Altenburg, Koeln, Leipzig, Weimar, Meuselwitz, Crimmitzschau, Roetgen, Iserlohn, Eisenberg, Friedrichsroda, Herrnhut, Hohenstein, Ronneburg
East Elbia	Barth, Lauban, Sorau, Magdeburg, Greiffenberg, Gnadau, Stettin, Mühlhausen, Waldenburg in Schlesien, Zeitz, Dessau, Graenzdorf, Marcklissa, Reichenau, Schwerta
Northwest Region	Braunschweig, Hameln, Hann. Muenden, Duisburg, Bonn, Hannover, Holzmünden
South-Southwest Region	Stuttgard, Ludwigsburg, Canstadt, Frankfurt am Main, Nürnberg, Dünckelsbühl, Bamberg, Calw, Hof, Hirschfeld (Hersfeld)

Note: town names as listed in August Schumann's directory, spelling may differ from modern spelling.

Figure 6: Regression Results

	(1) 1850	(2) 1875	(3) 1900
French Treatment	0.0236	-0.00788	0.0134
	(0.68)	(-0.11)	(0.09)
Textiles	-0.106	0.961	-1.300
	(-0.16)	(0.70)	(-0.46)
Enterprises per Capita	0.0128	0.0667	0.188
	(0.35)	(0.90)	(1.23)
Urban Manufacturing	0.00217	0.150	0.760
	(0.02)	(0.66)	(1.64)
Proto-Firms	2.052**	5.635***	9.155**
	(2.15)	(2.83)	(2.24)
Generalists	0.0155	1.278	-0.0513
	(0.03)	(1.06)	(-0.02)
Kommissionshändler	-0.250	-0.935**	-2.238**
	(-1.17)	(-2.12)	(-2.48)
Speditionshändler	0.181	0.592	1.612**
	(1.02)	(1.61)	(2.14)
Bookshops	0.651	2.307*	9.716***
	(1.07)	(1.84)	(3.77)
Early Industrializer	0.774	1.727	7.083*
	(0.96)	(1.02)	(2.04)
East Elbia	0.874	1.911	7.989**
	(1.06)	(1.10)	(2.25)
North-West	1.050	2.740	8.145**
	(1.31)	(1.66)	(2.40)
South-Southwest	0.529	1.607	7.048*
	(0.65)	(0.94)	(2.01)
Ocean port	0.696	1.925	5.392*
	(1.06)	(1.43)	(1.95)
Navigable River	0.467	0.773	1.895
	(1.55)	(1.24)	(1.49)
Free Imperial City (1820)	-0.595	-0.524	-1.207
	(-0.82)	(-0.35)	(-0.40)
Capital (1820)	-0.0416	0.619	1.940
	(-0.13)	(0.96)	(1.46)
(intercept)	-0.592	-3.083	-8.901*
	(-0.56)	(-1.39)	(-1.96)
N	49	47	47
R^2	0.362	0.464	0.621

t statistics in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Appendix 1: Population Data

Town	1798	1815	1830	1850	1875	1900
Dresden	61,732	49,879	68,886	100,989	192,374	396,146
Leipzig	47,168	33,292	40,946	63,689	127,387	456,126
Köln	40,378	49,767	64,893	96,042	136,117	372,429
Frankfurt am Main	36,766	41,629	48,978	61,126	111,392	288,989
Bremen	36,464	36,908	43,726	56,352	95,845	161,184
Braunschweig	27,780	30,624	33,369	37,391	58,350	123,081
Nürnberg	24,057	26,854	39,276	52,302	90,461	261,081
Lübeck	22,579	24,143	25,779	25,975	43,161	82,098
Magdeburg	22,507	29,179	44,046	52,055	113,644	229,667
Stuttgard (Stuttgart)	21,615	21,954	33,619	46,757	103,747	176,699
Stettin	17,959	21,444	28,990	44,104	79,077	210,702
Bamberg	16,918	17,808	17,854	18,630	27,449	41,823
Hannover	16,363	16,955	20,802	30,742	104,237	235,649
Basel	15,996	16,674	20,083	27,170	52,336	109,161
Gotha	11,618	11,117	12,724	14,925	No Data	No Data
Mühlhausen	9,254	9,553	11,222	12,706	21,786	33,433
Altenburg	8,722	9,740	12,440	15,927	22,755	37,110
Dessau	8,378	8,192	10,612	13,838	20,040	50,849
Zittau	7,134	5,437	9,100	10,100	20,200	30,900
Gera	6,258	8,154	9,826	12,665	20,810	45,634
Bautzen	6,166	7,697	8,130	11,124	14,709	26,024
Weimar	5,867	8,120	10,108	12,709	17,752	28,489
Bonn	5,849	10,153	12,985	18,350	28,467	50,736
Hof	5,194	5,238	6,781	885	18,226	32,781
Lauban	5,119	4,443	5,630	6,017	10,087	12,685
Ludwigsburg	5,089	5,629	8,627	10,912	12,019	19,436
Dünckelsbühl (Dinkelsbühl)	4,987	4,941	5,026	5,034	5,245	4,573

Zeitz	4,818	6,345	9,556	11,813	17,360	27,391
Hann. Münden	4,576	6,445	7,688	10,913	17,164	23,857
Iserlohn	4,449	4,986	7,416	11,967	16,988	27,156
Meissen	4,293	6,050	7,600	9,200	13,950	20,100
Annaberg	4,205	4,362	4,500	8,972	12,280	15,957
Duisburg am Rhein	3,881	5,566	7,005	18,857	35,296	92,530
Hohenstein	3,714	3,391	3,856	4,801	6,008	13,397
Eisenberg	3,596	3,630	4,557	4,975	5,509	8,824
Barth	3,113	3,823	3,690	5,021	6,335	7,072
Calw	3,087	3,468	5,418	4,449	5,173	4,943
Hameln	3,065	4,489	5,745	6,199	9,061	18,000
Holzmünden	2,894	3,095	3,272	4,014	6,887	9,857
Sorau	2,864	No Data	4,443	7,617	11,734	16,237
Hirschfeld (Hersfeld)	2,843	4,924	6,307	6,379	6,717	7,908
Canstadt (Bad Cannstatt)	2,712	2,932	4,454	5,407	8,881	10,265
Ronneburg	2,671	3,948	4,446	5,818	5,847	6,187
Greiffenberg (Schlesien)	2,325	1,934	2,116	2,606	2,858	3,522
Crimmitzschau	1,899	2,746	3,460	7,688	16,900	24,078
Friedrichsroda	1,510	1,537	1,724	2,262	2,830	4,396
Waldenburg in Schlesien	1,220	1,714	2,150	2,598	3,008	2,820
Meuselwitz	1,164	1,202	1,432	1,821	3,015	6,754
Marglissa (Marklissa)	976	1,255	1,502	1,830	2,241	2,332
Herrnhut	743	803	856	928	No Data	No Data
Löbau	No Data	1,313	2,450	3,966	6,308	9,710
Gnadau	No Data	No Data	No Data	No Data	No Data	No Data
Rötgen (near Aachen)	No Data	No Data	No Data	No Data	No Data	No Data
Gränzdorf (near Zittau)	No Data	No Data	No Data	No Data	No Data	No Data
Reichenau (near Zittau)	No Data	No Data	No Data	No Data	No Data	No Data
Schwerta (near Marklissa)	No Data	No Data	No Data	No Data	No Data	No Data

Source: own calculations based on population data sources.

Appendix 2: Sample of town-level summary statistics

Town	Generalists	Material.	Luxury	Foodstuff	Textiles	Tobacco	Dyes
Gotha	39	26	13	5	27	0	25
Barth	13	13	1	11	5	7	13
Bautzen	37	29	0	1	17	1	29
Stuttgard	57	48	6	10	21	3	5
Ludwigsburg	12	10	4	0	6	2	4
Canstadt	5	4	1	0	5	1	2
Dresden	135	106	15	10	43	7	107
Meissen	13	10	1	0	5	1	10
Lübeck	311	16	11	77	25	25	13
Lauban	12	10	2	0	38	0	11
Zittau	8	8	4	0	42	0	8
Frankfurt am Main	115	86	31	64	110	39	34
Braunschweig	117	52	34	60	64	12	52
Löbau	21	10	0	0	15	0	10
Sorau	17	9	1	0	17	2	9
Nürnberg	185	99	26	38	38	2	28
Magdeburg	179	146	5	18	36	2	148
Annaberg	4	2	2	0	17	1	2
Greiffenberg	14	0	0	1	15	0	0
Gera	21	18	2	1	10	2	18
Gnadau	1	1	0	0	2	0	1
Dünckelsbühl	9	6	4	7	22	0	2
Bamberg	32	15	5	0	13	0	3
Stettin	178	22	2	24	9	0	22
Hameln	9	1	0	1	3	9	1

Altenburg	29	18	3	7	15	3	19
Mühlhausen	1	0	0	2	6	0	0
Köln	208	133	32	109	133	52	16
Hann. Münden	40	35	0	6	4	2	35
Leipzig	143	82	47	37	100	31	88
Basel	70	60	26	10	104	3	59
Bremen	175	34	26	205	161	84	31
Weimar	19	10	6	1	9	3	10
Waldenburg (Schlesien)	3	3	0	2	15	0	0
Meuselwitz	0	0	0	0	2	0	0
Crimmitzschau	3	2	0	0	3	0	3
Zeitz	11	10	2	1	3	2	11
Dessau	12	6	3	0	11	2	6
Duisburg am Rhein	13	12	1	7	3	10	1
Rötgen	0	0	0	1	1	0	0
Iserlohn	20	0	1	0	14	0	0
Bonn	2	0	3	0	0	0	0
Calw	10	3	0	5	3	0	0
Eisenberg	6	4	2	0	6	4	4
Friedrichsroda	0	0	0	0	0	0	0
Gränzdorf	1	1	0	0	2	0	1
Hof	21	10	1	1	24	0	4
Herrnhut	0	0	1	0	2	1	0
Hirschfeld (Hersfeld)	0	0	0	1	9	0	0
Marklissa	7	1	0	1	10	0	1
Reichenau	0	0	0	0	19	0	0
Schwerta	3	3	0	0	4	0	3
Hannover	118	50	20	37	33	13	50
Hohenstein	2	2	1	1	9	1	4

Holzmünden	11	8	0	3	9	0	8
Ronneburg	10	7	1	1	6	1	7

Source: own calculations based on Schumann, *Versuch eines allgemeinen Handlungs- und Fabrikenaddreßbuches von Deutschland und einigen damit verwandten Provinzen*.