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Abstract

Preindustrial apprenticeship is often considered more stable than its nineteenth- and twentieth century counterparts, apparently because of the more durable relationships between masters and apprentices. Nevertheless, recent studies have suggested that many of those who started apprenticeships did not finish them. This paper examines how often individuals who had begun the process of qualification for skilled work failed to complete it, and how many conversely achieved local mastership. We provide new evidence on the completion of over 7,000 contracts across several cities in three countries. Even though apprenticeship regulation varied, in all cases a substantial minority of youths entering apprenticeship contracts failed to complete them. In turn, only a minority of journeymen would attain the status of masters. We consider the nature, frequency and causation of these failures. At least some exits reflect the balance of opportunities that youths faced, while obtaining mastership was affected by local and kin ties. By allowing premature exits, cities and guilds sustained labour markets by lowering the risks of entering long training contracts. Training flexibility was a pragmatic response to labour market tensions.

Keywords: apprenticeship; labour markets; human capital; skill; mastership; guilds; Europe; France; The Netherlands; England.

JEL Codes: N33, N430, N93, J620

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In the late nineteenth century, France, the UK and many other Western countries faced a “crisis in apprenticeship” that many believed was caused by the “greed” of apprentices quitting their contracts to earn wages and the venality of masters who exploited rather than trained youths. Today, even in Switzerland, Germany and Australia, countries where apprenticeship remains important, researchers and politicians worry about high levels of premature terminations. Quits affect 20 to 25 percent of contracts, rising to 40 percent in some industries. Relative outsiders, such as the children of poor families or immigrants, face bleaker prospects than youths with connections, but to many commentators all youths face too great a risk that their apprenticeship will end in ‘failure’.¹

Those commenting on the challenges that beset contemporary apprenticeship sometimes draw a more or less explicit comparison between its instability and an early-modern ‘golden age’ when apprenticeship was a stronger, if not necessarily social inclusive, institution. In their textbook on the economics of apprenticeship, for example, Smits and Stromback summarize a clear picture of pre-industrial apprenticeship, with fixed duration, restrictions on unilateral termination, and strong incentives to enforce those provisions – incentives primarily provided by guilds and the legal system. These ideas have influenced political debates on how to support apprenticeship. In 2010, the UK’s Minister for Skills Michael Hayes even called for a rebirth of guilds to help restore the status of apprenticeship. Just over a century earlier, another Member of Parliament, Richard Denman, had lamented that the ‘collapse of the guilds’ destroyed an ‘efficient system of technical training’ in which the ‘conditions of employment were .. minutely regulated’.²

The image of early-modern apprenticeship that is present in these discussions is rooted in the scholarly literature. A number of economic historians have emphasized the sturdiness of early modern apprenticeships. Social historians analysing how the young were socialized through apprenticeship have similarly imagined them embedded in durable

relationships with their master, with breakdowns often implying a household crisis. Denman's comments accompanied the first serious academic book on English apprenticeship. However, few studies have provided a longitudinal view of early-modern apprenticeship that would allow us to evaluate the frequency of quits or the likelihood of successfully reaching mastership directly. In fact, several of the handful of longitudinal studies that have recently appeared have found surprisingly high levels of early terminations. Studies identifying the large shortfall between the number of new masters and the numbers of new apprentices also give us cause to suspect that apprenticeship may not always have been particularly durable, although they usually cannot tell us why youths did not become masters, or when they stepped off the path towards mastership.³

In this paper, we examine the trajectories that youths followed from the beginning of their apprenticeship to mastership in four early-modern cities, Lyon, Amsterdam, Leiden and Shrewsbury, with diverse economic contexts and institutional settings. We focus on two key stages: the completion of apprenticeship contracts and entry to mastership. We consider how many youths left apprenticeship early, and (for some) when this occurred. What kinds of youth tended to stay, and, in particular, how much did social capital influence the outcomes of training? And finally, how many, and which, youths would eventually reach full membership of their guild by becoming a master?

These questions about the operation of apprenticeship connect to two wider debates in economic and social history. First, they offer us another way to assess the openness of pre-modern labour markets and the nature of skill formation and labour mobility more specifically. By comparing locations with quite different guild systems we are able to evaluate the prominent role guilds have played so far in narratives of early modern apprenticeship and assess the ways in which social capital distorted or sustained labour markets. Second, by uncovering the scale of mobility and the factors that influenced

movement, we are able to examine the stability of households and firms within what remained a highly patriarchal economic and social system. While a rich body of work has explored the conflicts and fragmentation that could occur within premodern workshops, quantitative evidence that allows us to consider the frequency of different outcomes is extremely scarce, especially if we go beyond the likely minority of conflicts that were discussed in courts. We thus offer novel ways to explore the tension between the image of households characterized by paternal socialisation aimed at compliance and subordination, and that of apprenticeship as a business-like agreement trading work for technical knowledge – with apprentices leaving if training was underprovided.⁴

APPRENTICESHIP IN SHREWSBURY, LYON AND THE NETHERLANDS

If we look at the structure of early-modern apprenticeship, we can see a number of good reasons to expect that it was a well-enforced institution. Starting an apprenticeship was costly, especially for migrants. Training was not easily available to all. Local ties could be needed to find a master, who might demand a fee (premium) for entry. Guilds or cities often limited the number of apprentices per master, defined entry requirements based on gender, faith, or other criteria, and extracted registration fees. Many apprenticeship contracts included local guarantors, and in France some contracts specified damages for exit. Quitting might scar a youth's reputation. Terminating contracts thus looks more costly in the early modern period than it does today. On the other hand, completion entitled youths to access privileged parts of the labour markets with higher wages. Many cities and towns restricted the right to operate independently to masters, and the right to work in a skilled occupation to journeymen: an apprenticeship was often necessary to acquire either status (although

sometimes masters' sons had an exemption). In principle, those youths with the good fortune to find a master had a strong incentive to complete their apprenticeships.⁵

That said, several recent studies that have presented quantitative evidence about persistence within apprenticeship have shown high rates of early exit. Around 40 percent of apprentices in London and Bristol in the 1690s left their master before their terms finished; Dutch orphan apprentices in the eighteenth century frequently moved between masters and crafts; more than half of the apprentices at the charity *Albergo di Virtù* in late eighteenth-century Turin left early, as did a quarter to a third of charity orphans in Lyon in the same period; in eighteenth- and nineteenth-century Vienna, termination rates mostly ranged around 30%, depending on occupation and gender, and reached 57% among locksmiths. Moreover, urban courts in London facilitated the cancellation of apprenticeship contracts: a mechanisms that we might expect to have tightened contracts actually made them flexible. Those studies suggest that the viability of apprenticeship was not undermined by premature terminations. Yet not all places saw the same levels of exits: the scattered numbers on exits available for early modern Germany are generally lower (12 percent or less); in Göttingen in the mid-nineteenth century, over 95 percent of carpenter and cabinet maker's apprentices completed their apprenticeships. Moreover, several of the most detailed studies are for places or groups that are, potentially, exceptional in nature: large, economically dynamic cities (Bristol; London; Vienna); orphans and charity recipients; areas with 'weak' guilds (England; Netherlands).⁶

Here we address these limits by examining exits from apprenticeship in both small towns and large cities, some of which were economically stagnant, and some governed by strong guilds. In addition, we follow at least some of the apprentices over several moments in their contracts and lives. This allows us to consider the impact of social differences on exits.

We explore apprenticeship in nine guilds in four cities across three countries. First, Shrewsbury, a small English city (c.10,000 population in 1700) distinguished by strong guilds (even in 1835 they remained ‘a serious detriment’, judged Parliamentary commissioners) and slow growth. Second, Lyon, a large and expanding city (c. 150,000 population in 1780) thriving through its dominance of silk-weaving - in 1784, the city’s 14,000 looms were double the number present in the rest of France. Lyon’s industry was intensely regulated by the silk guild, the *Grande fabrique*. Finally, Leiden and Amsterdam in the Netherlands both stagnated economically in the eighteenth century, although Amsterdam’s size (c. 200,000 population in 1680 and 1795) and commercial strength allowed it to avoid Leiden’s decline as a textile centre, visible in its fall from c. 56,000 to c. 31,000 population between 1700 and 1795. Both cities possessed guilds. Collectively, we have information on the completion of more than 7,000 apprenticeship contracts in these locations (Table 1). Ideally, of course, we would wish to include evidence on other regions, particularly Germany, Italy and Spain, and periods. Nonetheless, our case studies substantially extend the scope of existing research.⁷

<Insert Table 1 near here>

Apprenticeship varied in some respects across these cities. In Shrewsbury, terms lasted a minimum of seven years, compared to five years for Lyonnaise silk weavers and the Leiden surgeons, three years for Amsterdam pastry bakers and just two for Leiden’s pig butchers. Limits on the numbers of apprentices differed – in Lyon, just one was allowed. But crucially, all required apprentices to finish the minimum term before they could legitimately work as a journeyman or become a master. Evidence on the persistence of apprentices within their contracts is extremely scarce. The completion of an apprenticeship is rarely observable,

unlike admission as a guild master. Due to the institutional diversity of Europe's guilds and cities, different types of record survive from different settings. Here, we employ three different types of source and methodology to observe exits from apprenticeship and follow apprentices over time. One or another of these methods are likely to be replicable elsewhere.

Evidence on apprenticeship in Shrewsbury dates from the 1690s, when a tax on births, marriages and deaths led the city to list the members of 2,170 households in the city, including their servants and lodgers. We matched the householders in the tax register (by forename, surname and occupation) to the masters of a sample of 336 apprentices registered by five guilds (the Glovers, Mercers, Smiths, Tailors and Weavers) between 1681 and 1699. We successfully identified 66 percent of masters (124 of 188) in the core period of 1688-1695 with a high degree of confidence. We identified if apprentices lived with their masters, and take co-residence as a proxy for the persistence of apprenticeship. The key justification for this proxy is that co-residence was normal in apprenticeship, with board and lodging forming a key part of nearly all masters' responsibilities. As we discuss below, absence sometimes could be temporary, including assignments with other employers; additionally, some absent apprentices were dead. However, many, perhaps most, absences indicate the end of a contractual relationship.⁸

For Lyon, we analyse three guild registers from the late 1680s to the late 1760s that contain information on exits alongside the registration record of 5,281 apprentices. Unusually, the *Grande fabrique* obsessively recorded disruptions to contracts, presumably because they risked allowing a master to exceed their quota of apprentices, by scribbling a cramped note in the margin beside the original registration. Apprentice registration was rigorously maintained: 69 percent of contracts were registered within a week, and 92 percent within one month. Yet the result was not strong contracts, but a formal record of when apprentices and masters abandoned them.⁹

The registers inform us about three types of disruption: cancellations, interruptions, and transfers of apprentices to other masters. The guild's officers and clerks were not entirely consistent. In the 1680s, the register distinguishes between cancellations because the apprentice abandoned the trade (*'desistement'*) and those on the order of the consuls (a municipal court). The former appear more consensual, whereas the latter involved a formal procedure requiring one month of absence by the apprentice, a bailiff summoning him to return, and a final decision by the consuls. These details are missing later. From the 1740s, however, we do have records of interruptions and resumptions in contracts. Throughout, we observe the share of apprentices whose contract was formally cancelled. The language the clerks used for this was telling: the contract was scratched out (*'rayé par ordre'*). This formality was essential for the master if he was to take on a new apprentice.¹⁰

In Leiden and Amsterdam, we use guild records of whether an apprentice finished his required minimum term: notes kept by guild officials of which apprentices had received the *leerbrieft* ('letter of learning') that certified this fact. New journeymen were often required to show *leerbrieven* when taking up a position, especially in a new city. This is the most direct measure of completion that we possess, giving a positive record of completion rather than a negative record of exit or absence. However, it is rarely available. In most cases, letters were written privately by apprentices' masters (many apprenticeship contracts were also privately conducted). Only a tiny minority of guilds listed them. *Leerbrieft* registration was found for the Amsterdam pig butchers' guild, the Amsterdam pastry bakers' guild, and the Leiden surgeons' guild. Guilds charged fees for the *leerbrieft*, but these were not large sums that might significantly discourage apprentices from obtaining such an important certificate.¹¹

TERMINATING CONTRACTS: FREQUENT CANCELLATIONS, FREQUENT TRANSFERS

Our sources do not provide identical information on apprentices' exits. Nevertheless, all do allow us to estimate the share of apprentices who did not complete their terms (Table 2). These varied. In Shrewsbury, around forty percent of apprentices disappeared from their masters' household before the end of the seventh and final year of their contracts. In Lyon, eighteen percent of contracts were cancelled. Another 1.2 percent of apprentices died. Cancellation was most common in the 1680s, occurring in 24 percent of apprenticeships. For this period, the register reveals that in most cases the apprentice had quit – 18 percent were noted as 'desistement'. In all three Dutch guilds at least one in three apprentices quit early. It is interesting to note that in these guilds – set within a stagnating economy - early exits became more frequent over the course of the eighteenth century; this is the opposite of the trend in Lyon, where exits declined as the industrial centre grew.

<Insert Table 2 near here>

Permanent exits were not the only reason apprentices might leave their masters. We can flesh this out in some detail in Lyon, where the guild registers are to our knowledge unique in systematically recording *temporary* pauses in apprenticeship. They indicate that ten to fifteen percent of apprentices would interrupt their contract (Table 3). Of that group, around a third in the 1740s and a quarter in the 1760s would later restart. Another third later cancelled their contracts (of whom a small number had restarted first). We do not know what happened to the final third of apprentices who interrupted – for all the guild's official efforts, its records are incomplete. Perhaps they restarted without informing the guild. Perhaps they stayed away.

<Insert Table 3 near here>

The third way in which apprentices left their master was by transferring their contract to another master. In Lyon in the 1680s, 27 percent of new apprentices had a transfer recorded beside their initial registration. By the 1740s and 1760s, the system had shifted, and transfers were now entered separately, supplying 12 to 15 percent of entries in the register. This coincided with a tightening of regulation: in the 1680s, it seems that the transfer had often been leading to the initial contract being registered retrospectively, making it difficult to estimate the actual share of transfers. The 1740s and 1760s suggest that fifteen percent would be a minimum estimate for transfers, however. Transfers were also common in the Netherlands and England. Eleven percent of Dutch apprentices transferred to a new master. Interestingly, moving did not affect the chance of completion: about 39 percent of those who transferred exited early, compared to 42 percent of the rest. Shrewsbury's rates of transfer were similar: nine percent. Comparable rates occurred among apprentices from Leiden and Utrecht in the eighteenth century, London and Bristol in the 1690s, and Vienna in the nineteenth century.¹²

Although the number of cancellations and transfers differs between each of these cities and guilds, early exits from apprenticeship were commonplace in all cases. If we take the perspective of the original master whom the apprentice joined at the start of their contract, then they would see one third to one half of their apprentices leaving prematurely: our cases give us a range between Lyon, where at least 34 percent of masters would lose their apprentice either by cancellation, death or transfer (18%+1%+15%), and the Netherlands, where 53 to 64 percent would depart (42%+11% to 53%+11%). Shrewsbury falls in between with 46 percent leaving. Looking from the apprentices' side, the share who completed (some

with a different master) ranged between 46 and 80 percent: Shrewsbury and the Netherlands were at the low end and Lyon at the high.

We could speculate about the differences in apprenticeship exits between the cities. They may be an artefact of our methods: we will be overestimating persistence in Lyon to the extent that the guild's oversight was incomplete, and underestimating persistence in England and the Netherlands for those absent Shrewsbury apprentices who were still in contract or when the recording of *leerbrieft* was patchy. Alternatively, Lyon's strong guild and thriving silk industry may have motivated youths to stay, as seen among apprentices in growing trades today. Conversely, weak Dutch guilds and poor prospects offered less of an incentive. The main point is clear though. Even though the institutional and economic setting of apprenticeship markedly differed, in all three cases, apprentices and masters had much more flexibility to adjust agreements than a reading of regulations or contracts would suggest. The case of Lyon is particularly interesting in this respect, because the share of exits was clearly visible to the guild, but only led it to make transfers *easier* during the eighteenth century.

What caused so many apprentices to exit, whether to change city or trade, abandon training, or find a new master? The sources that we use here contain little to answer this question. Other records, such as court petitions, memoirs, and the memoranda kept by orphanage overseers, do document reasons for exit – often crafted to convince a specific audience. In Lyon, for example, the fact that the consuls could fine masters or apprentices if they concluded that the exit was not for a legitimate cause heavily influenced testimony, just as in London's Lord Mayors court the accusations in disputes over recovering premiums were trimmed to mimic the standard clauses of apprenticeship contracts.¹³

Despite these problems of interpretation, it is clear that many terminations were consequences of the “delicate intertemporal exchange” involved in (necessarily incomplete) apprenticeship contracts. Apprentices agreed to work over an extended period in exchange

for board and training with little certainty about the quality of instruction or treatment at the outset. Some apprentices discovered too late that their master was violent, miserly, or insufficiently skilful. Some were unable to learn their trade, found it too harsh, or rejected the service and submission expected of them. Some discovered or inherited better opportunities elsewhere. Apprentices even ran away to sea.¹⁴

Masters wrestled with similar problems: they expelled apprentices who stole, lied, disrupted workshops, assaulted mistresses, or wasted days or weeks in taverns. Some masters lacked sufficient work, fell bankrupt, or travelled. To give just one example, Suzanne Charezieu's son successfully petitioned Lyon's consuls to allow her son to transfer because his master's workshop had been destroyed. Arguably, mismatches were more likely when the apprentice came from a different place or social group from their master. The social differentiation of exits thus allows us to indirectly discuss such reasons behind contract terminations – at least those that were decided by apprentices. But the strong similarities between the causes listed in early modern sources and those found in studies of present-day apprenticeship breakdowns underline the unavoidability of these problems – underpinned by information asymmetry, bounded foresight, the impact of unanticipated events - in training contracts of long duration.¹⁵

EXITS BY INSIDERS AND OUTSIDERS

Intuitively, we would expect that the willingness to exit would vary between apprentices because of their respective resources, as it does today. Apprenticeship supplied some of the necessities for economic survival. Yet young adults also took advantage of family wealth and local connections. This presumably affected the costs (and benefits) of departure. For instance, exiting might have been hard for youths with strong family ties in the city. Why

leave if it means you will not qualify to take over the family business? Flexibility in the enforcement of contracts did not imply the absence of social and institutional pressures for completion. Together with the likelihood mentioned above that apprentices who knew the trade, city and master were less likely to make bad matches, this suggests a simple hypothesis: rates of departure should be lower among youths with relatively close connections to their master, locality and occupation (needless to say, it is easy to envisage other possible, complementary explanations based on age, wealth, economic shocks).¹⁶

If we look at which apprentices left, this logic played out in Shrewsbury and The Netherlands. In Shrewsbury strong local ties are associated with persistence. Boys bound to their father stayed far more often than those bound to strangers (83 vs. 53 percent, $p=0.008$). Apprentices whose fathers were freemen of the Shrewsbury guild they entered (a group that overlaps substantially with those bound to their fathers) were much more likely to be present than those who were not (76 vs. 54 percent, $p=0.063$). Those whose fathers were burgesses of the city were also more likely to be present than the rest, although the difference is not significant at standard levels (67 vs. 53 percent, $p=0.219$). Note that the strength of the tie weakens with each step away from the guild. It is family ties to the institution that dominate, not geography. In fact, boys from outside Shrewsbury were more likely to remain with their master than local boys who did not have a freeman father (73 vs. 50 percent, $p=0.064$).¹⁷

The effect of local origin and family ties can also be examined for two of the Dutch samples. Among Amsterdam butchers' apprentices, local youths were much more likely to earn their *leerbrief* than foreigners (61 vs. 45 percent, $p=0.006$). However, family ties (indicated by a shared surname) were even more important: many more foreign apprentices finished if they were bound to a similarly-named master (75 vs. 36 percent, $p=0.000$); among native Dutch apprentices, having family ties also strongly favoured completion (93 vs. 47 percent, $p=0.000$). Among Leiden surgeons' apprentices, completion rates rise as we move

from immigrants, to local non-citizens' sons, and finally to master's sons (44 vs. 60 vs. 82 percent, $p = 0.000$). In both guilds, family ties were the strongest predictor of completion, with local connections adding a further reinforcement.¹⁸

For Lyon, place of origin is the only characteristic that can be used to identify differences between apprentices, and then only in the eighteenth century; master's sons were exempted from the obligation to serve an apprenticeship (in practice, they often served an informal apprenticeship, as *affermés*). When we compare the fortunes of apprentices from the city of Lyon with those from further afield, we find no meaningful difference. Migrants were marginally more likely to cancel their contracts than locals, but the difference was small (15.3 vs. 11.8 percent, $p=0.063$) in the 1760s, and trivial (19.0 vs. 17.2 percent, $p =0.103$) in the 1740s.¹⁹

Aside from Lyon then, being a relative insider does appear to have reduced apprentices' willingness to leave their contracts. This may reflect their better information or the stronger incentives (damage to reputation; loss of access to family assets) they faced. Probably, both these factors, and more, worked in parallel. Signs of the same rationale can be found in some contemporary accounts by artisans, and is apparent in patterns of return migration by apprentices. It could also explain why exits in Lyon were less differentiated by geographical origins, since the concentration of silk weaving in Lyon meant that quitting apprentices would find few opportunities elsewhere.²⁰

THE TIMING OF EXITS

We can better appreciate the nature of apprentices' movements if we look at when they left their masters. Today, most contract terminations (both transfers and quits) happen during the first year, because poor working conditions, difficulties between apprentice and master, or a

lack of interest in the occupation are generally recognized quickly. Terminations are more common for youths with worse prospects (immigrants, poor) who are selected into worse placements and whose information may be poorer. However, in the nineteenth century many commentators believed that exits mainly happened late in the term - the point when the master gains most from his now-trained apprentice's presence - because apprentices were leaving to work as journeymen for other masters. In short, the timing of departure implies different types of causation and different patterns of agency: while early departures might be initiated by either master or apprentice, it is apprentices who are more likely to be choosing to exit late in the term. Of course, alongside these 'intentional' exits, apprenticeships also ended through the impact of mortality, morbidity and firms' economic failure.²¹

For Lyon and Shrewsbury, but not for the Netherlands, we are able to compute the timing of apprentices' exits. For Shrewsbury this is measured by the share of apprentices still present in their master's household by year of contract; for Lyon this is measured by counting the months between the cancellation date and the date of the apprenticeship contract. The latter is obviously more precise, since absence does not necessarily imply contract termination, as we discussed earlier. Figure 1 groups the presence (Shrewsbury) and cancellation or transfers of contracts during apprentices' terms (Lyon), to indicate when apprentices may have exited from their contracts. In both cases, the cohorts are synthetic, rather than reports of sequential observations for individuals.

<Insert Figure 1 near here>

In Lyon, most of the cancellations happened during the three first years of the contract in the 1740s, and the two first years in the 1760s, but exits continued throughout the term. There is no clear clustering of departures either at the start or end of the contract. This implies

a mix of motivations among apprentices and masters: from resolving a poor initial match to quitting after having learned enough.

For Shrewsbury, the shape of the line in Figure 1 is similar to that observed in studies of London and Bristol: there is evidence of considerable rates of absence among apprentices; and the share who are present declines over time. Interpretation is complicated by the initial rise in the share of apprentices present: the peak (71 percent) comes in the third year of contracts; this probably reflects apprentices delaying the actual start of their contracts to shorten the long seven-year term. The share present then declines: only 37 percent are present in their sixth year. The surprising recovery in the final year to 54 percent is a pattern seen elsewhere in England, and is likely to reflect those apprentices with an eye to careers in Shrewsbury returning in order to publicly finish their training. The drop from peak to trough is large – almost 50 percent. If we take the last year as equivalent to the exit rate excluding temporary absentees, then the drop would be around a quarter. The true figure is likely to fall between these estimates, however, as the snapshot-like nature of the tax data does not allow us to observe the true ‘peak’ of presence. The speed of decline is somewhat slower than in London and Bristol, implying somewhat greater persistence. The clear impact of institutional forces that imposed lengthy fixed terms and rewarded ‘completion’ makes it difficult to infer causation from timing with any exactitude in Shrewsbury, but the substantial trough in the second half of the term surely suggests that a substantial share of exits were being made by youths who had achieved some skill.²²

Across both locations, our results point to the existence of a mix of reasons behind apprentices’ decisions to leave (or their masters’ choice to fire). Exits were not – so far as we can tell – heavily clustered at the start or end of training.

FROM APPRENTICE TO MASTER

Historians have long recognised that the pathway from binding as an apprentice to taking the oath of a master was only one of many possible outcomes for youths entering urban labour markets. Perhaps the clearest signal of this is the substantial gap that usually existed between the numbers of new apprentices and the numbers of new masters in each guild (Figure 2). The similarities across Europe are striking. Low ratios of apprentices to masters are commonplace. Even in the craft of surgeons, with relatively high apprenticeship fees, no more than fifteen percent of Dutch apprentices eventually became masters. Of all the cities for which figures are available, it was only in the Paris masons' guild that more than half of apprentices became masters. In all other cases, most apprentices were never likely to become a master – at least locally.²³

<Insert Figure 2 near here>

In fact, guild structures defined three possible local outcomes for apprentices. The first was exiting during the apprenticeship. The second route was qualifying as journeymen, but not achieving mastership in the local guild and either remaining as a waged worker or migrating elsewhere. The third option was to become a master in the local guild. We have seen that considerable numbers of youths experienced the first outcome. What was the distribution across the other two outcomes? For the three Dutch guilds, lists of masters can be linked to apprentices to examine how dominant each of the first three routes might have been. Figure 3 shows the share of apprentices receiving *lehrbrief*, discussed above, alongside the share becoming master, for each group of Dutch apprentices. It is clear that a lot of apprentices who qualified as journeymen would remain so throughout their career. Across the

three guilds between 22 and 43 percent of apprentices qualified as journeymen but never became masters in their local guild.²⁴

<Insert Figure 3 near here>

Local connections sharply improved the chances that a youth would become a master in the Netherlands. In the butchers' and pastry bakers' guilds, roughly half of those apprentices who possessed ties to local masters and who became journeymen would later become masters themselves, compared to only a quarter of those apprentices without local ties who became journeymen. The contrast was even starker among Leiden surgeons' apprentices: 27 percent of apprentices with ties who became journeymen later became masters, but only 9 percent of journeymen without ties made that final step ($p=0.001$). (The lower rate of mastership among journeymen surgeons with ties appears to be because a relatively large share of sons of masters obtained their *leerbrief* in the first place.) Given that possessing ties already affected the chance of completing an apprenticeship, the cumulative effect that connections had on the chance of corporate success for these youths was dramatic. Just four to ten percent of non-local youths who started apprenticeships in these three guilds later became masters, compared to 20 to 30 percent of youths with kin ties.

In Lyon, mastership could be obtained in several ways, making it harder to trace the route from apprentice to master. The main grounds were apprenticeship (36%), being a master's son (38%), and marriage to a master's daughter or widow (36%); some qualified under several headings. Another three percent (mostly foreigners) entered after working as a journeyman without having been apprenticed in Lyon. Few apprentices whose contracts were cancelled later emerged as master (just 5 of the 138 apprentices traced among masters). The

time it took for youths to become masters varied widely, rendering direct linkage with our sample of apprentices impossible at present.

Nonetheless, we can estimate the share of apprentices in Lyon who became masters. Between 1769 and 1773 inclusive, 281 of 777 new masters qualified by apprenticeship and another 116 former apprentices qualified via another route, an average of 79 per year. Between 1763 and 1765, the latest years in which these former apprentices had started training, 1,126 new apprenticeships were registered, an average of 375 per year. If these rates are broadly representative, then around 21 percent ($79/375$) of youths who started as apprentices later became masters. Given that at least 18 percent of apprentices cancelled their contracts, this implies that up to 61 percent of those who started apprenticeships in silk weaving spent their lives as journeymen – either in Lyon or elsewhere – and that a minimum of 26 percent ($21/82$) of those who qualified as journeymen became masters.

Did connections matter for mastership in Lyon as they did in the Netherlands? For Lyon we cannot directly calculate the odds of mastership for the sons of masters, but they must have been much higher than for migrant apprentices. If the odds were the same this would imply that at least 26 percent of master's sons became masters. Yet given that sons supplied 38 percent of new masters, this would imply enormously high fertility among masters (if for simplicity, we assume the flow of masters is stable, then on average every master would need to produce 1.5 adult male children ($38 \times (100/26)$); in fact, as the number of masters was growing, the challenge was even greater). While our estimates are rougher than for the Netherlands, the results are similar: mastership was achieved by a minority of journeymen, and was much more likely to be attained by those with strong local connections.

For Shrewsbury, the long term outcomes of apprentices are also difficult to estimate, thanks to patchy guild records and the unusual English practice of expecting journeymen to become guild freemen. Overall, 34 percent of apprentices later became freemen in the three

guilds for which we can link apprentices to mastership entries, with rates varying between 24 percent in the Weavers' and 45 percent in the Tailors' guild. Put alongside our earlier estimate that around 54 percent of apprentices finished their contracts, this implies that about 18 percent either remained as journeymen in the city without becoming freemen (this was not uncommon even when individuals did later become freemen) or migrated elsewhere - not far from the shares seen in Dutch guilds, but much lower than in Lyon.²⁵

There are signs that the bias towards insiders that affected persistence within apprenticeship in Shrewsbury played out in mastership too. Youths who trained with their father were more likely to become masters in the Mercers and Weavers' guilds than others (63 vs 42 percent in the Mercers ($p=0.057$); 67 vs. 29 percent in the Weavers). Youths from Shrewsbury were also more likely to become masters (39 vs. 31 percent). These results are tentative though: only the first of these results meets standard levels of statistical significance, and among tailors' apprentices fewer kin became masters. If we focus just on those apprentices who were in the final four years of their contracts at the point in 1695 when we can observe presence or absence (by taking the last four years we avoid those who have not yet arrived), it was those apprentices who remained with their master that had a real chance of becoming freemen. True, mastership remained a minority outcome, but the odds were far better for those we find living with their master than they were for youths who were missing (44 vs. 7 percent, $p=0.095$).

Shrewsbury offers us one other useful, if crude, indicator of success: the share of apprentices who later became burgesses (citizens) in the city. The burgesses were a small, wealthy group, whose rights were primarily political rather than economic; they formed an urban elite. Apprenticeship was *not* a criterion for becoming a burgess (as it was for guild membership). Only a small minority - sixteen percent - of apprentices became burgesses. Among this group, those apprentices found with their masters were more than twice as likely

to become burgesses than those who were absent (21 vs. 9 percent, $p=0.091$). Absence seriously reduced the chance of succeeding on this (local) measure. Note, that the fluidity of apprenticeship contracts that we observe here is not a simple division between successful (present) and failed (absent) apprentices. Absence could also come about as apprentices found a better match, pursued an alternative career in Shrewsbury, worked elsewhere, or delayed starting work with their master.²⁶

Mastership was the exception not the rule for youths who began an apprenticeship *and* for those who finished one successfully. But it was a status that was more likely to be achieved by those with strong ties to the guild, particularly the sons of existing masters. Insiders experienced a smoother passage both as apprentices and journeymen – much as they do today.

There are two obvious ways to explain this outcome: guilds might hinder the entry of journeymen who were not insiders; or sons might be at an advantage because they possessed prior knowledge and better local resources. Some guilds did fix the rules to advantage their own. Among those we discuss here, Lyon did not expect masters' sons to serve an apprenticeship; in Shrewsbury, some masters' sons also seem to have entered without a formal apprenticeship; in the Netherlands, sons paid lower registration fees.

After youths had started their apprenticeship, however, there is no sign that outsiders were treated differently or systematically discouraged. In most Dutch guilds, outsiders paid the same mastership fee as members' sons, as they did in Shrewsbury. No report survives of any apprentice who applied for freedom being rejected in Shrewsbury or the Dutch guilds. Such official silences can, obviously, conceal all kinds of exclusionary activities. Yet arguably, these guilds had little to gain from conspiring against qualified outsiders, and much to lose if any surreptitious moves to exclude those who were qualified for membership led to their privileges being challenged at law. The fact that insiders enjoyed better prospects at

each stage of their lives, from drawing up their apprenticeship contract to mastership, thus seems likely to reflect their home-field advantage, not biased refereeing by the guild.

CONCLUSION

Pre-modern cities set out a normative institutional framework for work that appears on the surface to define a highly segmented labour market. Subsequent commentators have often taken these norms as reflecting quotidian realities. Yet, as this and other recent studies have shown, the practice of apprenticeship was flexible not rigid in much of Europe. Youths and journeymen came and went, from place to place, master to master, and probably occupation to occupation. Exit rates among apprentices were substantial. Outsiders left more often than insiders. For those apprentices who did qualify as journeymen, the chance of becoming a master was low, and was conditioned by the same factors – local connections – that affected apprentices’ persistence. The distribution of ‘success’ in apprenticeship and mastership seems, from what we can see in these cases, to reflect the differences in the opportunities they encountered and the resources they possessed, as well as the risks they faced. Leaving an apprenticeship was not costless. But the penalties – reputational damage, uncertainty, the risk of lawsuits – were apparently more likely to be outweighed by the benefits for youths who were lacked close ties to the city and craft they were leaving. If this seems too optimistic an interpretation, it seems plausible that masters felt a greater freedom to eject the children of outsiders. There can be little doubt that both apprentices and masters drove the attrition of contracts that we observe in these cities.²⁷

Instability was an integral part of early modern apprenticeship and skilled labour markets. In the context of the high departure rates we observe here, it seems reasonable to assume that many new apprentices must have been well aware that they were unlikely to

attain the status of journeymen, let alone master. Masters too must have recognized that many apprentices would not finish their contracts, and their own interests drove them to eject a proportion of their trainees themselves. None of the guilds involved attempted to enforce the completion of apprenticeship contracts, whether with an eye to bolstering training or backing up exploitative masters. Instead, they coexisted comfortably with this situation. The most bureaucratic, such as Lyon and London, even set up systems to process exits. While mastership has few exact modern parallels, the chances of finishing an apprenticeship, and the inequalities in opportunity between those with local connections and outsiders, strongly echo many studies of apprenticeship in the early twenty-first century.²⁸

If the parallels between modern and early modern apprenticeship are stronger than is often recognised, to understand why apprenticeship might benefit from this flexibility it is useful to draw another modern parallel: today's universities, where drop-out rates are often substantial, yet institutions fail to deter exits. The comparison highlights the two sides of flexibility: on the one hand, dropping out can signal poor-quality provision; on the other hand, dropping out allows students to escape from bad matches to courses and careers. As for apprenticeship, all exits are not failures. Nor are they distributed randomly across social groups. Restricting drop-outs could lead to poorer outcomes for some individuals. In particular, increasing penalties for exit could deter potential entrants or lock individuals into bad choices. Turning back to pre-modern cities, a similar logic may hold, especially where guilds and cities had to attract migrant labour from outside their communities if they were to sustain their workforces.²⁹

Indeed, the strength of apprenticeship as an institution that survived throughout the centuries may be explained not by the rigidity of the guild system, but rather by its flexibility in allowing actors to use it in diverse ways. We cannot measure these costs and benefits directly in the past, but two aspects of this system – the long survival of these local regimes,

and the connection drawn in recent work between flexible training systems and economic growth in the past – suggest that the wider moral to be drawn would be that, for apprenticeship, ‘failure’ had its own value.³⁰

Table 1. Overview of apprenticeship samples.

City	Guild	Period	Apprentices
Shrewsbury	Glovers	1688-1695	28
	Mercer	1688-1695	31
	Smiths	1688-1695	41
	Tailors	1688-1695	59
	Weavers	1688-1695	17
Lyon	Grande fabrique	1680s	1,041
		1740s	2,505
		1760s	1,735
Leiden	Surgeons	1683-1729	394
Amsterdam	Pastry bakers	1748-1776	643
	Pig butchers	1787-1811	517
Total			7,011

Sources: Shrewsbury: Shropshire Archives MS6001/126; 6001/4263; 6001/5837; 6001/3360; 6001/4583. Lyon: Municipal Archives, HH 597; HH601; HH602; Netherlands: Stadsarchief Amsterdam, Archief Gilden, inv. 591; inv. 1470; Regionaal Archief Leiden, Archief Gilden, inv. 351.

Table 2. Apprenticeship cancellation.

Location	Guild	Period	Exits (%)	N
Shrewsbury	Combined	c.1690	46.2 ¹	126
Lyon	Silk Weavers	c.1680	24.3	955
		c.1740	17.5	2,123
		c.1760	13.9	1,526
		Total	17.7	4,604
Leiden	Surgeons	1683-1729	40	394
Amsterdam	Pastry bakers	1748-1776	50	643
	Pig butchers	1787-1811	34-68	517
		Total	42-53	1,554

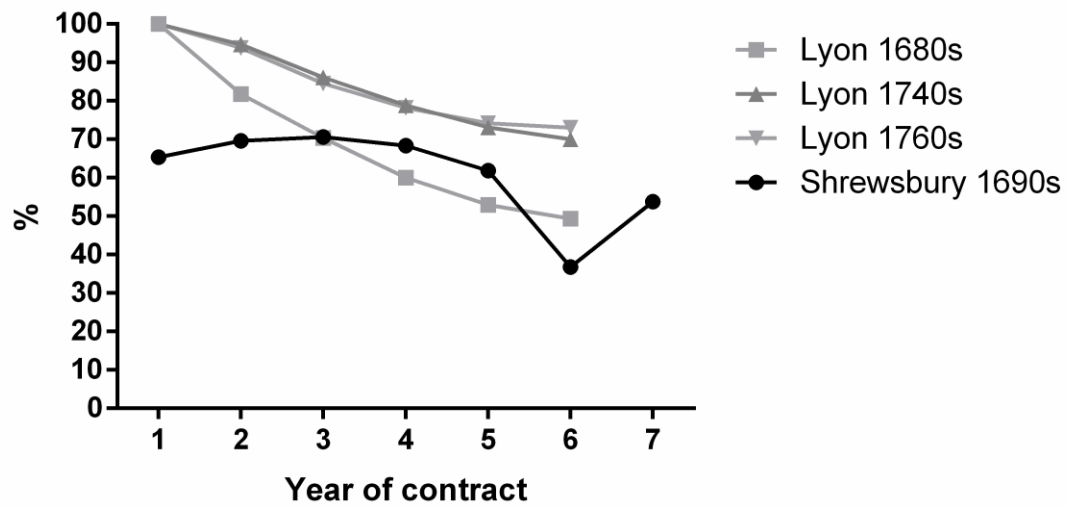
Notes: For Shrewsbury we report the share present in the final year of their term and we are unable to discriminate between transfer and cancellation. For Lyon, we report the share of apprentices whose contracts ended by cancellation (the sample is restricted to new apprentice registrations). For the Netherlands, we report the share of apprentices who did not receive a *leerbrief*. The pig butchers guild includes 173 apprentices with no recorded outcome; we report the range between a minimum (apprentices with known outcomes) and maximum (that assumes apprentices with no outcome did not receive their *leerbrief*).

Table 3. Interruptions of contracts in Lyon.

	I	II	III	IV	V	
Period	Interrupt	Then restart	Then cancel	Cancel after restart	Unknown	Total
	(%)	(%)	(%)	(%)	(%)	N
1740s	11.4	3.8	3.9	0.5	4.2	2,136
1760s	15.9	3.6	7.49	0.3	5.11	1,533
All	13.2	3.8	5.4	0.4	4.4	
Total	489	138	199	16	168	3,669

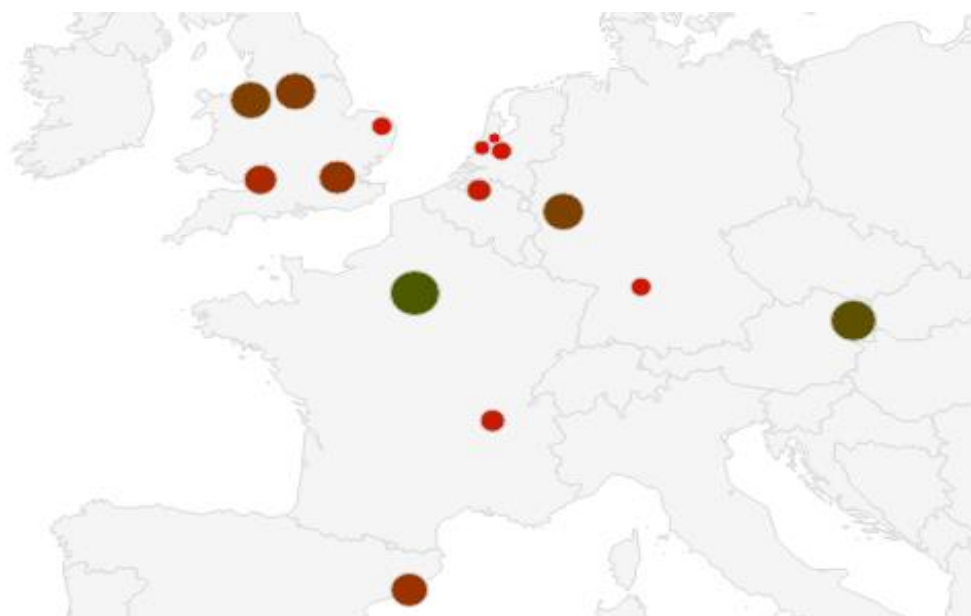
Notes: the table reports the percentage of apprentices registered as interrupting contract, restarting after an interruption, and cancelling contract after interrupting. Column IV reports the share cancelling after restarting and these individuals are also counted in column III (Cancel). Column 5 reports the share unknown, i.e. $V=I-II-(III-IV)$. Sample restricted to new apprentice registrations.

Figure 1. The share of apprentices remaining with their first master, Lyon & Shrewsbury.



Notes: For Lyon the figure shows the share surviving of a synthetic cohort of apprentices experiencing the rate of transfer and cancellation observed in each period. No attempt is made to account for the effect of interruptions. For Shrewsbury, the share present in year t represents a cluster of apprentices observed in 1695 at t years after starting their contract. Each year thus represents a different group of individual apprentices.

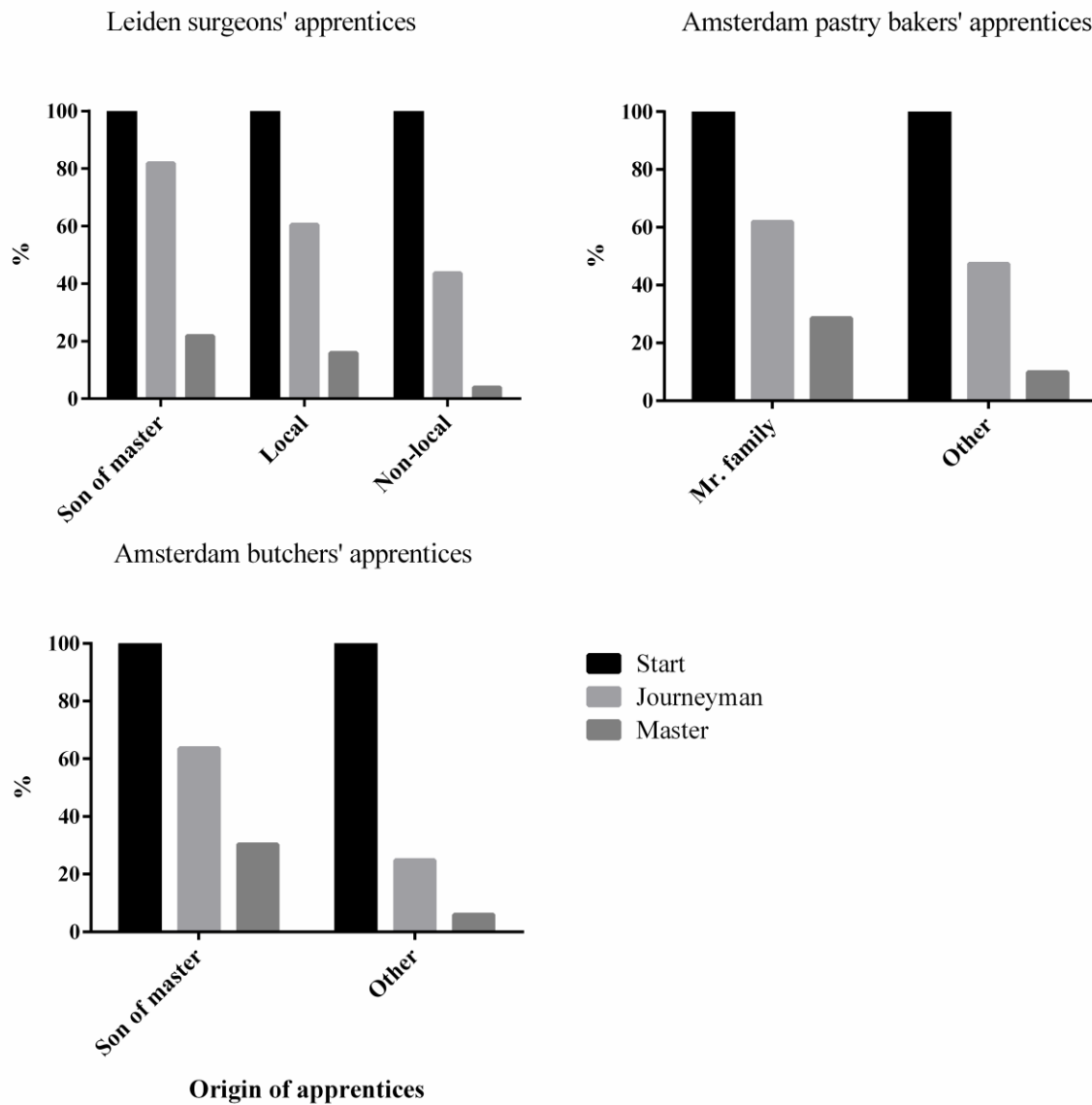
Figure 2. Share of apprentices becoming master in their guild of training.



Notes: When figures were available for more than one guild per city we have given the average share. The figure for Vienna refers to apprentices completing their contracts.

Sources: see Appendix.

Figure 3. Careers of Dutch apprentices within their guild of training.



Notes: Journeyman status is equated with apprentices obtaining their *leerbrief*.

Appendix

Share of apprentices becoming master within their guild of training.

City	Guild	percent	Period
Amsterdam	Pig butchers	11	1787-1811
Antwerp	Cabinet makers	11	1691-1760
Antwerp	Carpenters	14	1701-1790
Antwerp	Shoemakers	17	1766-1793
Antwerp	Gold and silversmiths	21	1577-1763
Antwerp	Tinsmiths and plumbers	30	1711-1790
Antwerp	Tanners	33	1678-1785
Barcelona	Book sellers	28	1760-1788
Barcelona	Silk weavers	50	1782-1834
Bristol	All	32	1560-1680
Chester	Leather crafts	50	1558-1625
Leiden	Surgeons	15	1683-1729
London	Masons, carpenters, stationers, cordwainers, drapers	41	1633-1660
Lyon	Silk weavers	21	1769-1771
Madrid	Passementiers, carpenters, tailors	11	1720-1780
Norwich	All	17	1510-1700
Paris	Masons	70	18th c.
Rhine Region	Coopers and blacksmiths	51	1529-1615
Sheffield	Cutlers	47	1624-1814

Utrecht	Surgeons	9	1740-1799
Utrecht	Coopers	22	1588-1662
Vienna	Locksmiths	43	1785-1803
Vienna	Leather workers	61	1709-1854
Vienna	Pearl embroiderers	68	1665-1865
Vienna	Book binders	80	1750-1804
Württemberg	Worsted weaving	10	1616-1626
Württemberg	Worsted weaving	26	1750-1760

Note: The figure for Vienna refers to apprentices completing their contracts.

Sources: Ben-Amos, “Failure to Become Freeman,” 157; De Munck, *Technologies of Learning*, 161-167; Victoria López Barahona and José Antolín Nieto Sánchez, “Artisan Apprenticeship in Early Modern Madrid (1561-1800),” Paper presented at the workshop “Apprenticeship in Early Modern Europe”, Utrecht (2016), 16; Sheilagh Ogilvie, *State Corporatism and Proto-Industry: The Württemberg Black Forest, 1580-1797* (Cambridge, 1997), 149; Ruben Schalk, “Apprenticeships and Craft Guilds in the Netherlands, 1600–1900,” *CGEH Working Paper Series*, 80 (2016), 18-19; Àngels Solà Parera, ‘Craft Apprenticeship in Barcelona, 1760-1850,’ Paper presented at the workshop “Apprenticeship in Early Modern Europe”, Utrecht (2016), 10-12; Sonenscher, *Work and Wages*, 109-110; Wallis, “Apprenticeship and Training,” 839; Patrick Wallis, “Research memo Lyon apprentice - master linkage”; Kurt Wesoly, *Lehrlinge und Handwerksgesellen am Mittelrhein: Ihre Soziale Lage und Ihre Organisation vom 14. bis ins 17. Jahrhundert* (Frankfurt am Main, 1985), 90; Annemarie Steidl, *Auf nach Wien!: die Mobilität des Mitteleuropäischen Handwerks im 18. und 19. Jahrhundert am Beispiel der Haupt- und Residenzstadt* (Vienna, 2003), 253.

1 Stéphane Lembre, “La “Crise” de l’Apprentissage: De l’Échec à la Loi (Fin XIXe Siècle-Années Vingt),” in Natacha Coquery and Matthieu de Oliveira (eds.), *L’Échec a-t-il des Vertus Économiques?* (Paris, 2015), 309-318 (on France); Donata Bessey and Uschi Backers-Gellner, “Premature Apprenticeship Terminations: An Economic Analysis,” *Swiss Leading House Economics of Education Working paper # 2* (2007) (on Germany); Nadia Lamamra and Jonas Masdonati, *Arrêter une Formation Professionnelle, Mots et Maux d’Apprenti.e.s* (Lausanne, 2009) (on Switzerland); Evi Schmid and Barbara E. Stalder, “Dropping Out from Apprenticeship

Training as an Opportunity for Change”, in Paivi Tynjälä et al. (eds.), *Transitions and Transformations in Learning and Education* (Dordrecht, 2012), 117-130 (on Switzerland); Alice Bednaez, “Understanding the Non-completion of Apprentices”, *National Centre for Vocational Education Research occasional paper* (Adelaide, 2014) (on Australia); Irene Kriesi et al., “Bleiben? Gehen? Neu Beginnen? Häufigkeit, Ursachen und Folgen von Lehrvertragsauflösungen”, *Trendbericht 1 des Schweizerischen Observatoriums für die Berufsbildung* (Zollikofen, 2016). Gilles Moreau, *Le Monde Apprenti* (Paris, 2003), and Benoît Cart et al., “Contrat d'Apprentissage, les Raisons de la Rupture”, *Bref CEREQ*, 272 (2010), 1-4, mention surprisingly similar numbers, patterns and reasons for France, where apprenticeship is much less common.

2 Wendy Smits and Thorsten Stromback, *The Economics of the Apprenticeship System* (Cheltenham, 2001); John Hayes, “The Craft so Long to Lerne”: Skills and their Place in Modern Britain” (Royal Society of Arts, 26 Oct. 2010); Olive Jocelyn Dunlop and Richard Douglas Denman. *English Apprenticeship & Child Labour* (London, 1912), 20-21. It should be noted that Dunlop’s own plans did not encompass a restoration of guilds. For similar comments in nineteenth-century France and The Netherlands see Charles Loquet, *L'Apprentissage à l'Atelier de l'Industrie Privée et à l'École* (Rouen, 1884), and Eduard A. von Saher, “Beschouwingen over onze Ambachtsnijverheid,” *Orgaan der Nederlandsche Maatschappij ter bevordering van Nijverheid*, 2 (1891), 93-109.

3 The key economic history studies focusing on apprenticeship and work organization include Stephan (Larry) Epstein, “Craft Guilds, Apprenticeship, and Technological Change in Preindustrial Europe,” *Journal of Economic History*, 58 (1998), 684-713; Sheilagh Ogilvie, “Rehabilitating the Guilds: a Reply,” *Economic History Review*, 61 (2008), 175–82; Bert De Munck, “From Brotherhood Community to Civil Society? Apprentices between Guild, Household and the Freedom of Contract in Early Modern Antwerp,” *Social History*, 35 (2010), 1-20. For social history: Dunlop and Denman, *Apprenticeship*; Paul Griffiths, *Youth and Authority: Formative Experiences in England, 1560-1640* (Oxford, 1996); Anne Yarbrough, “Apprentices as Adolescents in Sixteenth Century Bristol,” *Journal of Social History*, 13 (1979), 67-81; Bert De Munck, *Technologies of Learning: Apprenticeship in Antwerp Guilds from the 15th Century to the End of the Ancien Régime* (Turnhout 2007), 161-169.

4 On labour markets, Epstein, “Craft Guilds”; Sheilagh Ogilvie, “Guilds, Efficiency, and Social Capital: Evidence from German Proto-Industry,” *Economic History Review*, LVII (2004), 286–333. Cf. Jan Luiten van Zanden, “The Skill Premium and the “Great Divergence,” *European Review of Economic History*, 13 (2009), 121-153. On conflicts, e.g. Peter Rushton, “The Matter in Variance: Adolescents and Domestic Conflict in the

Pre-Industrial Economy of Northeast England, 1600-1800,” *Journal of Social History*, 25 (1991), 89-107; Steven L. Kaplan, *La Fin des Corporations* (Paris, 2001). On opposite views of apprenticeship, De Munck, “From Brotherhood Community”; Yarbrough, “Apprentices as Adolescents”; Alys Levene, “‘Honesty, Sobriety and Diligence’: Master–Apprentice Relations in Eighteenth- and Nineteenth-Century England,” *Social History*, 33 (2008), 183-200.

5 Tim Leunig, Chris Minns, and Patrick Wallis, “Networks in the Premodern Economy: The Market for London Apprenticeships, 1600-1749,” *Journal of Economic History*, 71 (2011), 413-443; Ogilvie, “Guilds, Efficiency,”; Maarten Prak et al., “Access to the Trade: Citizens, Craft Guilds and Geographical Mobility in Early Modern Europe,” Unpublished paper available at http://beucitizen.eu/wpcontent/uploads/bEUCitizen_WPS1_Prak-et-al.-2014.pdf; Chrystèle Santailler, *Les Contrats d'Apprentissage à Lyon au 18e siècle*, Unpublished master’s thesis at Université Lyon 2 (1988), 44-45, 70-71. In the archives of the municipal court of the consuls (Lyon Municipal Archives, HH 214-267), we indeed find guarantors as defendants and some masters asking for damages in cases of termination, in addition to the expenses they made to feed the apprentice.

6 Chris Minns and Patrick Wallis, “Rules and Reality: Quantifying the Practice of Apprenticeship in Early Modern England,” *Economic History Review* 65 (2012), 556-579; Ruben Schalk, ‘From Orphan to Artisan: Apprenticeship Careers and Contract Enforcement in The Netherlands Before and After the Guild Abolition,’ *Economic History Review* (forthcoming); Beatrice Zucca Micheletto, “Outside the Box. Multiple Patterns of Apprenticeship in Old Regime Turin: Actors, Institutions and Social Relations”, Paper presented at the workshop “Apprenticeship in Early Modern Europe”, Utrecht (2016); Annemarie Steidl, “Silk Weaver and Purse Maker Apprentices in Eighteenth- and Nineteenth-Century Vienna,” in Bert De Munck, Steven L. Kaplan and Hugo Soly (eds.), *Learning on the Shop Floor: Historical Perspectives on Apprenticeship* (New York, 2007), 133-57; Jean-Pierre Gutton, “L’Insertion Sociale des Enfants Recueillis par la Charité de Lyon au XVIIIe Siècle. Un Bilan Provisoire,” in Jean-Pierre Bardet et al. (eds.) *Lorsque l’Enfant Grandit. Entre Dépendance et Autonomie* (Paris, 2003), 929-939; Reinhold Reith and Georg Stöger, “Apprentices and Apprenticeship in German Speaking Areas during the Early Modern Period”, Paper presented at the workshop “Apprenticeship in Early Modern Europe”, Utrecht (2016); Uta Ludwig, *Die Soziale Lage und Soziale Organisation des Kleingewerbes in der Ersten Hälfte des 19. Jahrhunderts* (Göttingen, 1982); Patrick Wallis, “Labor, Law, and Training in Early Modern London: Apprenticeship and the City’s Institutions,” *The Journal of British Studies* 51 (2012), 791-819; Ulrich Pfister, “Craft guilds and proto-industrialization in Europe, 16th to 18th centuries,” in Larry Epstein et al. (eds.), *Guilds, economy and society* (Seville, 1998), 11–24; A. Caracaci, “The Price of an

Apprentice: Contracts and Trials in the Woollen Industry in Sixteenth Century Italy,” *The Mélanges de l’École française de Rome - Italie et Méditerranée modernes et contemporaines*, 128 (2016) (URL: <http://mefrim.revues.org/2476>).

7 “First Report of the Commissioners Appointed to Inquire into the Municipal Corporations in England and Wales,” *London: House of Commons Parliamentary Papers*, 116 (1835), 2016; Maurice Garden, *Lyon et les Lyonnais au XVIIIe Siècle* (Paris, 1970). The guild’s rules are set out in Justin Godart, *L’Ouvrier en Soie. Monographie du Tisseur Lyonnais, part 1 (La réglementation du travail)* (Lyon and Paris, 1899), 100-133. See also: Pierre Cayez, *Métiers Jacquard et Hauts Fourneaux* (Lyon, 1978), 45. Alain Cottereau, “The Fate of Collective Manufactures in the Industrial World: The Silk Industries of Lyons and London, 1800-1850,” in Charles Sabel and Jonathan Zeitlin (eds.), *World of Possibilities. Mass Production and Flexibility in Western Industrialization* (Cambridge, 1997), 75-153; George J. Sheridan Jr., “Craft Technique, Association and Guild History: The Silk Weavers of Nineteenth-Century Lyon,” in Ian A. Gadd and Patrick Wallis (eds.), *Guilds and Association in Europe, 900-1900* (London, 2006). On Amsterdam and Leiden : Marco H.D van Leeuwen and James E. Oeppen, “Reconstructing the Demographic Regime of Amsterdam 1681-1920,” *Economic and Social History of The Netherlands*, 5 (1993), 61-102; G. Peter M. Pot, *Arm Leiden: levensstandaard, bedeling en bedeeiden, 1750-1854* (Haarlem, 1994); Piet Lourens and Jan Lucassen, “De Oprichting en Ontwikkeling van Ambachtsgilden in Nederland (13de-19de eeuw),” in Catharina Soly and Hugo Lis (eds.), *Werelden van verschil. Ambachtsgilden in de Lage Landen* (Brussels, 1997), 43-77.

8 Another five masters can be matched, but with less confidence (largely due to lack of occupational information); five are potentially matched to more than one household (and are thus excluded). There are multiple reasons why a master might not be found in the tax listing: variant spellings; damage to the sources; out-migration, bankruptcy or death. We can test the assumption of co-residence by tracking apprentices with parents resident in Shrewsbury. Of 33 youths identified as still in Shrewsbury: two were living with their parents; 31 (94%) were living with their master. Patrick Wallis, “Apprenticeship and Training in Premodern England,” *Journal of Economic History*, 68 (2008), 832-861; Minns and Wallis, “Rules and Reality”.

9 In theory, masters were fined if they did not register a contract within a week: Godart, *L’Ouvrier en Soie*, 107.

10 Godart, *L’Ouvrier en Soie*, 111-113.

11 Isabella H. van Eeghen, *De Gilden: Theorie en Praktijk* (Bussum, 1965), 20; For surgeons’ fees see Regionaal Archief Leiden, Archief Gilden, inv. 311.

12 Shrewsbury n = 29 of 317 (this is likely an underestimate due to censoring at the end of term). Data on other cities: Minns and Wallis, “Rules and Reality”; Schalk, “From Orphan to Artisan”; Annemarie Steidl, “Between Home and Workshop. Regional and Social Mobility of Apprentices in 18th and 19th Centuries Vienna,” *The Mélanges de l’École française de Rome - Italie et Méditerranée modernes et contemporaines*, 128 (2016) (ULR: <https://mefrim.revues.org/2491>).

13 Steven R. Smith, “The London Apprentices as Seventeenth-Century Adolescents,” *Past & Present*, 61 (1973), 149-161; Jane Humphries, *Childhood and Child Labour in the British Industrial Revolution* (Cambridge, 2010); Levene, “Honesty, Sobriety, and Diligence”; Schalk, “From Orphan to Artisan”; Wallis, “Labor, Law, and Training”.

14 The phrase “delicate intertemporal exchange” is from Steven L. Kaplan and Gilles Postel-Vinay, “L’Apprentissage: un Destin?”, *Le Gnomon*, 126 (2000), 23-24. Details about the apprentices’ complaints from police or judicial sources are e.g. given by Steven L. Kaplan, “L’Apprentissage au XVIIIe Siècle: le Cas de Paris”, *Revue d’Histoire Moderne et Contemporaine*, 40 (1993), 436-479; Peter Rushton, “The Matter in Variance: Adolescents and Domestic Conflict in the Pre-Industrial Economy of Northeast England, 1600-1800,” *Journal of Social History*, 25 (1991), 89-107; Reith and Stöger, “Apprentices and Apprenticeship”; Gutton, “L’Insertion Sociale”; Griffiths *Youth*; Godart, *L’Ouvrier en Soie*, 111-6; Margaret Pelling, “Apprenticeship, Health and Social Cohesion in Early Modern London,” *History Workshop Journal* 37 (1994), 33-56.

15 Charezieu’s case is from the Lyon Municipal Archives, HH 241, 7 February 1749. On contemporary firms, see for example Peter Cappelli, “Youth Apprenticeship in Britain: Lessons for the United States,” *Industrial Relations*, 35 (1996), 1-31; Alice Bednarz, “Understanding the Non-Completion of Apprentices,” *National Centre for Vocational Education Research* (Adelaide, 2014) ; Jens Mohrenweiser and Uschi Backes-Gellner, “Apprenticeship Training: For Investment or Substitution?,” *International Journal of Manpower*, 31 (2010), 545-562.

16 On the importance (today) of reputation in obtaining later jobs, and the interest employers have in using training to identify productive employees, see Smits and Stromback, *The Economics of the Apprenticeship System*; Herman G. van de Werfhorst, “Skills, Positional Good or Social Closure? The Role of Education Across Structural – Institutional Labour Market Settings,” *Journal of Education and Work*, 24 (2011), 521-548.

17 For simplicity, we report the results of Pearson’s chi-squared tests for independence throughout the paper. The statistics for Shrewsbury here are based on the 150 apprentices in the sample who were bound 1688-95

inclusive, whose master was linked to a householder, and for whom we are clear if they are found or are missing from the household. If the apprentice was turned over before 1695, we examine their new master's household.

18 287 of 440 Amsterdam butcher apprentices were of foreign descent. Guild fees allow us to distinguish sons of masters, sons of Leiden citizens, and others.

19 The place of origin of the apprentice is rarely recorded when a transfer is being registered in the 1740s and 1760s, so we cannot examine the relationship between transfer and local origins.

20 Wallis, "Apprenticeship and Training" ; Ilana K. Ben-Amos, 'Failure to Become Freeman: Urban Apprentices in Early Modern England', *Social History*, 16 (1991), 155-172.; Marc Klemp et al., "Picking Winners? The Effect of Birth Order and Migration on Parental Human Capital investments in Pre-Modern England," *European Review of Economic History* 17 (2013), 210-232.

21 Bessey and Backers-Gellner, "Premature Apprenticeship Terminations"; Bednaez, "Understanding the Non-Completion". For a presentation and qualification of the "two-stage model" of apprenticeship, leading to the prediction that apprentices would leave during the last years of the contract see Wallis, "Apprenticeship and Training".

22 Minns and Wallis, "Rules and Reality".

23 On the choice to remain a journeyman, James R. Farr, *Artisans in Europe, 1300-1914* (Cambridge, 2000), 37. Studies on journeymen: Antwerp: De Munck *Technologies of Learning*, 131-135; Utrecht: Nico Slokker, *Ruggengraat van de Stedelijke Samenleving: De Rol van de Gilden in de Stad Utrecht, 1528-1818* (Utrecht, 2009), 35-39; Vienna: Josef Ehmer, "Worlds of Mobility: Migration Patterns of Viennese Artisans in the Eighteenth Century," in Geoffrey Crossick (ed.), *The Artisan and the European Town* (Aldershot, 1997), 175-176; France: Michael Sonenscher, *Work and Wages: Natural Law, Politics, and the Eighteenth-Century French Trades* (Cambridge, 1989), 140-145.

24 Masters were manually linked to apprenticeship registers. Mismatching is unlikely because for all guilds the lists give full names of masters and apprentices, the year of starting the apprenticeship, and at times the date of becoming master. Apprentices without a *leerbrieft* rarely appeared as masters: three (all transfers) in Leiden and none in the Amsterdam butchers. In the Amsterdam pastry bakers' ten apprentices without a known *leerbrieft* do appear as masters; the other 77 apprentices who became masters did have one. Five of those without *leerbrieft* were related to masters, so it is conceivable that their *leerbrieven* were more likely to be under recorded. In that case the results would only be biased downwards, since we already find a higher propensity to complete among apprentices related to masters.

25 Freedom rates are calculated for a sample of 211 apprentices in three guilds (Tailors, Mercers, Weavers) for which consistent records of freedom (mastership) entries survive for c. 1680-1700: Shropshire Archives, MS 6001/5837, 4262, 3360. Two-thirds took the freedom within two years of the end of their contract, but entries occurred up to 18 years after the end of servitude.

26 Guild membership was also more extensive than citizenship: only 40% (19 of 47) Shrewsbury guild members placing sons as apprentices were burgesses. We exclude apprentices made burgesses while children under their father's entry from the calculation in this paragraph.

27 Schalk, "From Orphan to Artisan"; Minns and Wallis, "Rules and Reality".

28 Epstein, "Craft Guilds"; Ogilvie, "Guilds, Efficiency"; Karel Davids, "Apprenticeship and Guild Control in The Netherlands, c.1450-1800", in De Munck, Kaplan and Soly, *Learning on the Shop Floor*, 65-84; Bernard Elbaum and Nirvikar Singh, "The Economic Rationale of Apprenticeship Training: Some Lessons from British and U.S. Experience," *Industrial Relations*, 34 (1995), 593-622; Wallis, "Labor, Law, and Training"; Kaplan, "L'Apprentissage à Paris", 444. Cf. Sonenscher, *Work and Wages*, ch. 5.

29 See e.g. Stephen L. DesJardins et al., "The Effects of Interrupted Enrollment on Graduation from College: Racial, Income, and Ability Differences," *Economics of Education Review*, 25 (2006), 575-590. On attracting or discouraging skilled workers see Johan Dambruyne, *Corporatieve Middengroepen: Aspiraties, Relaties en Transformaties in de 16de-eeuwse Gentse Ambachtswereld* (Ghent, 2002); B. Panhuysen, *Maatwerk: Kleermakers, Naaisters, Oudkleerkopers en de Gilden (1500-1800)* (Amsterdam, 2000).

30 On prospects out of guilds, see e.g. Steven L. Kaplan, *La Fin des Corporations*; Bert De Munck, "One Counter and your Own Account: Redefining Illicit Labour in Early Modern Antwerp," *Urban History*, 37 (2010), 26-44. On the fact that economic actors, contrary to the dominant Weberian stances, do not always favour inflexible contracts with predictable outcomes, see Lisa Bernstein, "Merchant Law in a Merchant Court: Rethinking the Code's Search for Immanent Business Norms", *University of Pennsylvania Law Review*, 144 (1996), 1765-1822. On flexible training and economic growth see Morgan Kelly and Cormac Ó Gráda, "Ready for Revolution? The English Economy before 1800," *UCD Centre for Economic Research Working Paper Series* WP14/18 (2014) (URL: <http://hdl.handle.net/10197/6131>). Schmid and Stalder, "Dropping out", offers a parallel argument for Switzerland today.