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Trade in Coinage, Gresham's Law, and the Drive to Monetary Unification: The Holy Roman Empire, 1519-59

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Abstract
Research on premodern monetary unions has so far started out from the idea that such unions were designed to promote trade and economic integration. The present paper demonstrates that this in an anachronistic misconception. Premodern monetary unions were the answer to political and fiscal problems caused by Gresham's Law in a monetary environment characterised permeable borders and by the increasing integration of currency markets. As integration advanced significantly in the fifteenth and early sixteenth centuries, the regional monetary unions that had been formed in the late medieval Holy Roman Empire were increasingly insufficient to address these problems. This is why the imperial estates were interested in creating and Empire-wide common currency – an aim they reached at the end of the 1550s.

Introduction

In early December 2001, about three weeks before the Euro replaced the established currencies of the countries that had decided to adopt it, the Sunday edition of the German daily "Die Welt" published a piece on the history of currency unions. Explaining that the Germans' cherished Deutschmark itself was the outcome of a monetary union much like the one now being formed, the author of the brief article looked back to the late Middle Ages, claiming that back then 'a large number of different currencies were circulating in the German lands'. He continued to argue that this was 'to the great detriment of the merchants who on foreign markets first had to exchange their money for the locally valid currency. This cost time and most importantly high fees'. The piece concludes that it was 'to remedy this defect' that political authorities formed monetary unions.[1]

With the exception of the first sentence – the one about the many currencies circulating in Germany – almost none of this is correct. Yet we should not blame the author of the piece in "Die

[1] Rattmann (2001).

Welt" for his misconceptions. Academic writers are sharing them. As a matter of fact, so far everyone who ever looked at premodern monetary unions (including myself) seems to have taken for granted that they were designed to help trade. More than a hundred years ago, one author argued that monetary diversity harmed commerce, whose growth depended on an orderly coinage; this was why perceptive authorities coordinated their policies, forming currency unions.[2] Another early twentieth-century writer claimed that it was the commercially important among the free imperial cities that were most strongly interested in overcoming monetary diversity,[3] while a historian of the 1970s argued that the territorial princes whose revenues were made up of taxes on trade pushed a policy of monetary unification.[4] Given all this, Lars Boerner and I assumed as a matter of course that monetary unification was intended to support trade when we examined the link between currency unions and market integration in fourteenth and fifteenth-century Germany about a decade ago.[5] This seemed all the more obvious because it is the angle taken by economists, too. None of them doubts that monetary harmonisation reduces the costs of negotiating commercial agreements between regions that used to have different currencies. Currency unions thus help interregional trade. What is disputed among economists is whether monetary unification is a purely political act or whether it can be accomplished only where markets already are fairly closely connected.[6] Evidence from the early twentieth century suggests that a certain degree of prior market integration is indeed needed.[7] Lars Boerner and I found that late medieval monetary unions, too, emerged where markets were already relatively well-integrated; we speculated this was because under a commodity money system, monetary authorities wanting to form a union needed to agree on a common standard of their coinage. If local bullion prices diverged, as we assumed they were bound to do between weakly integrated markets, this was difficult.[8]

It is the purpose of the present paper to demonstrate that all this is an anachronistic misunderstanding. At least in the Holy Roman Empire, the drive towards the creation of a common currency – most importantly the Empire-wide one agreed in 1559 – was not due to the desire to help trade and economic integration. Quite the contrary: the aim was preventing trade, or at least a certain type of trade. The paper also shows that while there was a link between integration and monetary harmonisation, this worked in a way fundamentally different from the

2 Lennartz (1913), p. 1.
3 Kamann (1928), p. 259.
4 Blaich (1970), p. 15; cf. Probszt (1973), p. 397; Schön (2008), p. 467; Kümper (2020), p. 180.
5 Boerner and Volckart (2011), p. 63.
6 Rose (2000); Rose (2001).
7 Eichengreen and Irwin (1995); Wolf and Ritschl (2011).
8 Boerner and Volckart (2011), p. 54.

one Lars Boerner and I had in mind. In fact, monetary unification was not based on the erosion of price differentials between bullion markets; rather, it was the answer to crises caused by the integration of markets where currencies were traded.

The paper splits into two big parts. In the first, I am looking at the trade in coinage that flourished in early sixteenth-century Germany. I am showing how this trade worked, why it was possible and which consequences it had for the authorities that formed the Holy Roman Empire (the imperial estates). The second part focuses on the solutions the estates developed to address the consequences of the trade in coinage. I am looking at two such solutions: one that failed and one that finally went to the root of the problem. The concluding section summarises the findings of the paper.

Trade in coinage: How did it work?

In late summer 2017 I was working in the excellent municipal archive of the city of Augsburg that had only recently moved to new, modern premises. Looking for evidence for sixteenth-century currency crime, I was going through the 'Strafbuch', the 'Book of Penalties', where the magistrate entered brief summaries of law cases that the urban courts dealt with. Among the entries for the year 1549 I came across the following paragraph:

> 'Silvester Raid has spent a considerable sum of money of Hildesheim's coins as *Kreuzers*, despite them having a value of no more than 5 *Hellers*, wherefore he was jailed, fined 100 *Guldens* and released … on condition that he swore an oath not to take revenge on Augsburg and its officials'.[9]

This interested me. *Kreuzers* were medium-sized silver coins whose official value in Augsburg was 7 *Hellers*. I knew they were part of the coinage issued by a regional monetary union that a number of imperial estates between Alsace and Austria – Augsburg among them – had formed in 1535 under the aegis of King Ferdinand.[10] In Upper-Germany *Kreuzers* were therefore widely known; many authorities minted them, using the same characteristic design on the front of the coin (a double cross, which is why the pieces were called *Kreuzers*) and normally placing their coat of arms on the back. However, the city of Hildesheim is almost 600 kilometres away to the north. It was no member of the Upper-German monetary union, and the money that its burghers, the other

9 StAA, Strafbuch 1543-1553, fol. 156r.
10 Hirsch (1756), no. CLXXXIII, pp. 268-271.

inhabitants and the people in the countryside around used was quite different from the one common in Swabia. So how come *Kreuzers* from Hildesheim appeared in Augsburg?

Fortunately, much of the paperwork of Raid's trial, including the minutes of his interrogation, has been preserved. Having located the material with the help of the archivist, I found that Raid told a convoluted story that evidently aimed at implicating as many members of Augsburg's commercial high society as possible.[11] He claimed that he had been on the point of travelling to North Germany when he was approached by Franz Merz, a well-connected merchant and citizen of Augsburg, who suggested a business deal. A relative of Merz, Hans Schaller, owned about 500 *Guldens* worth of *Kreuzers* from Hildesheim (1 Gulden was 60 *Kreuzers*). Schaller's problem was that the exact type of his *Kreuzers* was too unfamiliar in and around Augsburg to make it possible to easily spend large sums, though he claimed that he had paid up to 50 *Guldens* in small tranches to 'peasants and other such folk'. The main thing was: the *Kreuzers* were good and genuine. Did not Raid want to take them back to North Germany? Schaller was prepared to let him make a good profit.[12]

Raid seems to have seen no harm in taking Schaller's money back to where it belonged. After all, it looked alright: As a contemporary chronicle has it, 'on the one side it looked exactly like *Kreuzers*, with the cross on it, and the size was right; on the other side it carried a coat of arms of which some said that it was the bishop of Hildesheim's'.[13] However, Raid quickly appears to have noticed that he had taken on more than he had bargained for. The sum he accepted was 472 *Guldens*, with 6 *Kreuzers* per *Gulden* being his commission. Transporting so much cash – almost 30,000 coins with a total weight in excess of 35 kilograms – over miles of bad and often robber-infested roads was no mean feat. Raid quickly had enough, especially as an alternative presented itself. He got wind of Cardinal Otto von Waldburg, the bishop of Augsburg, being hard pressed by his creditors and urgently needing cash. Raid offered the *Kreuzers*; an agent of Waldburg's creditors came to collect them, tried to exchange them for golden ducats, which were much easier to transport, and became suspicious.[14] At this time, commercial centres such as Augsburg employed 'assayers', that is, officials tasked with checking the precious metal content of coins members of the public presented to them. Raid claimed later that Schaller had taken his *Kreuzers* to Augsburg's assayer and that Schaller therefore knew they contained nowhere near as much silver as Upper German *Kreuzers*

11 Häberlein (1998), S. 210-211.
12 StAA 00084 Urgichten 1549.VI.18, Silvester Raid: 1549.07.16, Verhörprotokoll.
13 Roth (1917), p. 182.
14 StAA 00084 Urgichten 1549.VI.18, Silvester Raid: 1549.07.16, Verhörprotokoll.

when he passed them on to Raid.[15] It is equally possible that it was the cardinal's creditors who had the money tested. Be that as it may, when Augsburg's magistrates interrogated Raid in 1549 they presented him with the fact that the coins contained almost 30 per cent less silver than they should have done.[16] They considered them forgeries and evidently worried that if left unchecked, their import would undermine Augsburg's comparatively good coinage.

Today, the phenomenon Augsburg's city fathers feared is known as Gresham's Law. In its simplest and most widely quoted form the law says that 'bad money drives out good', and in this case it was the bad *Kreuzer*s from Hildesheim that were expected to drive out the good Upper-German originals. By the sixteenth century, the phenomenon was widely known (and many authorities responsible for making monetary policy decisions were aware of it.[17] It is no surprise that the magistrate of Augsburg was afraid of its consequences. Still, the city fathers did not have to deal with an ordinary case of forgery. No criminal had misused the bishop of Hildesheim's coat of arms. In fact, the arms were not those of the bishop at all; they were those of the city of Hildesheim that seems to have enjoyed the right to issue its own coins since at least the thirteenth century.[18] Only a few years before, Hildesheim had concluded a contract with a new mint master that specified the range of coins he was to produce. Among them there was a fairly large coin, which the new master designed to look like the 2-*Schilling* pieces the monetary union formed by Lübeck, Hamburg, Lüneburg and Wismar issued, and a smaller coin called 'small *Schilling*' that he modelled on the Upper-German *Kreuzer*. In both cases, his coins contained less pure silver than the originals.[19] There is no doubt that he intended to benefit from the sale his coins in places where genuine *Kreuzers* (and double-*Schillings*) were current.

Plate 1: Genuine Kreuzer of the imperial city of Kempten in Upper Germany (left) versus imitation Kreuzer ('Small Schilling') from Hildesheim (right), c. 1535 to 1550[20]

15 Roth (1917), p. 183 with FN 2.
16 StAA 00084, Urgichten 1549.VI.18., Silvester Raid: No date, articles for the interrogation of Raid.
17 Selgin (2020), S. 201-202.
18 Buck and Bahrfeld (1937), p. 1.
19 Buck and Bahrfeld (1937), p. 65.
20 © Auktionen Münzhandlung Sonntag (with friendly permission); © WAG Online (with friendly permission).

All in all, Hildesheim's mint master produced at least 1¼ million 'small *Schillings*'.[21] We do not know how many of these *Kreuzer*-imitations were brought to Upper Germany. Neither do we know how large the share of Upper-German consumer was who rejected this money or who were suspicious enough to accept it only at a discount. It is possible that Augsburg with its public assayer and large, commercially astute population was less suited than most places for attempting to circulate underweight coins. Let us therefore leave Raid and his trial and consider what was going on elsewhere.

Take the Baltic duchies of Pomerania and Mecklenburg, for example. We learn about them from Bartholomäus Sastrow, who is probably one of the most intimately known non-princely characters of sixteenth-century Germany: A 'skilful, cunning, hot-headed, and probably often hard and partial man', as the nineteenth-century writer Gustav Freytag characterised him,[22] we are so well-acquainted with Sastrow because he left an autobiography written during the last years of his life. The book is remarkable not only because there are not many memoirs from sixteenth-century Germany, but even more because of Sastrow's colourful and apparently accurate description of everyday life. Born in 1520, Sastrow spent some time studying the law at Rostock University. He left without a degree but still managed to become a notary at the imperial chamber court, later a councillor of the duke of Pomerania and burgomaster of Stralsund.[23] His older brother Johannes was a master at Wittenberg university. Sastrow describes how in 1542 Johannes journeyed to Lübeck and Rostock to take care of some publications.

> 'When he travelled home from Rostock Master Heinrich Sonnenberg and a woman were his companions on the cart, and next to the cart rode Hans Lagebusch and a young, genteel fellow called Hermann Lepper, who had taken several hundred *Guldens* worth of Duke Bogislaw's *Schillings* and other coin to the mint at Gadebusch and now took home newly minted money from there; this lay on the cart. Some footpads, as such villains are called, learnt of this and went the same way, being minded to capture some good loot'.

Sastrow went on to describe how,

> 'when the cart was passing the village of Willershagen, which is under Rostock's authority and close to Rostock heath, those on the cart got off, taking their arms with them, and the two riders, who in that insecure place should have stayed close by, went some way ahead where the footpads joined them. One, especially, rode next to Lagebusch, talking to him companionably, and when he was riding so close to him that

21 Buck and Bahrfeld (1937), p. 109.
22 Freytag (1862), p. 175.
23 Pyl (1890); Trauner (2004).

> he could reach Lagebusch's hand gun (back then it was not yet the fashion to carry two guns in your saddle bags) he suddenly grabbed the weapon, which was loaded and cocked'.[24]

There followed a violent scuffle, every shot, thrust and stroke of which old Bartholomäus described with relish and which left Johannes severely wounded.

Here we see Gresham's Law in full force. In Pomerania, Hermann Lepper was evidently in the same business as Hans Schaller in Augsburg a few years later, though Lepper seems to have been involved more deeply. We cannot be sure that Schaller deliberately deceived Raid, whereas Lepper certainly knew what he was doing. He purchased Schillings struck under the authority of Duke Bogislaw X of Pomerania, with which he supplied the duke of Mecklenburg's mint at Gadebusch. Once the mint had melted the money, mixed the alloy with base metal and struck new coins, he took these back to Pomerania. The 'trade in coinage' between the two duchies was brisk, with contemporaries seeing Pomerania as its neighbour's victim. The Stralsund-born chronicler Thomas Kantzow, for example, remarked that Duke Bogislaw's Schillings were so good that merchants from Rostock in Mecklenburg were willing to pay a premium in order to get hold of them – only to take them to their home town's mint, where they were used as raw material for the town's comparatively shoddy coinage.[25]

Plate 2: Pomeranian Schilling (left) versus Schilling of Rostock (right), first half of the 16th century[26]

Pomerania's coat of arms shows the griffin, which also happens to be the device of Rostock. Still, with some goodwill the town would have been able to design its *Schillings* in a way that made the difference between them and their Pomeranian counterparts obvious. The lettering on the coins

[24] Sastrow and Mohnike (1823), pp. 195-197. The only English edition of Sastrow's autobiography is a fanciful retelling rather than a proper translation. Cf. Vandam (1902), pp. 100-101.
[25] Gaebel (1897), p. 346.
[26] © Münzenhandlung Brom (with friendly permission).

was not the same, of course, but this did not help if you were as illiterate as the majority of the population. Rostock's de facto imitations therefore found a ready market in Pomerania. Kantzow, who felt strongly about the welfare of his home country, wistfully remembered the times a hundred years before when counterfeiters were still punished properly: Rather than being merely burnt at the stake (as the Empire's common law code of 1532 demanded)[27] they were fried in hot oil. 'If this punishment was applied in our times', he remarked sourly, 'there would be many princes and lords, yeah, even magistrates, who would have to be fried'.[28] He misunderstood the situation. Like the city of Hildesheim, the dukes of Mecklenburg and the town of Rostock did not commit a crime; they were merely exploiting their well-established and age-old rights and privileges. That the privilege to mint covered the right to determine the standard of the coinage as well as its design was universally acknowledged. Counterfeiting was not the issue. It is telling, however, that educated people like Kantzow who found themselves at the receiving end of such policies used that term to describe what was going on. From their perspective, there was little to choose between common counterfeiters and princes who behaved like the dukes of Mecklenburg.

Other observers focused less on the authorities that produced underweight imitations of foreign money than on people like Lepper who engaged in the trade in coinage. The artful merchant who sought out the 'better' coins in order to sell them to a mint that re-struck them as base imitations was a stock figure of late fifteenth- and early sixteenth-century literature. His practices show up in Sabastian Brant's 'Ship of Fools', one of the most popular moralising poetic works of the late Middle Ages – interestingly in a passage that was much abridged in the English translation published in 1509, which suggests that in England, where only one mint supplied the whole country with money, readers were not familiar with the problem.[29] It also occurs in a rhymed booklet by Kunz Haß, a member of the famous guild of master singers of Nuremberg: 'Good coin is lost, with the silver standard being low in one place and high in another. … Whoever understands these things strives to obtain silver by culling the heavier coins, thereby winning an ounce in the pound'.[30] Most importantly, it figures in a large number of complaints raised by authorities that suffered from the effects of this practice. The magistrate of the city of Hamburg, for example, declared in 1539 that

> 'several burghers and inhabitants of this city bring whole sacks and barrels of lightweight 3- and 6-*Pfennig*-pieces from elsewhere into the city in order to exchange

[27] Kohler and Scheel (1900), § 111, p. 51.
[28] Gaebel (1897), p. 266.
[29] Zarncke (1854/1961), p. 97; cf. Brant (1874), p. 222.
[30] Haß (ca. 1500), fols. 3v.-4r.

> them for the city's *Schillings*, *Talers*, *Marks* and other good coinage, which they export, thereby seeking their self-interest and acting against the common weal, with the result that all good coin is being driven out'.[31]

At roughly the same time Lübeck complained about the same practice.[32] Some years later King Ferdinand's Bohemian councillors stated in a memo that 'everyone knew his royal Majesty's silver-rich coin … had not benefited his Majesty's land and people, but that the money had all been exported like a commercial good, melted elsewhere and re-minted into poorer coins which, together with other light coins, had then been re-imported into the country and become common'.[33] Again, Gresham's Law in action.

Trade in coinage: Causes and consequences

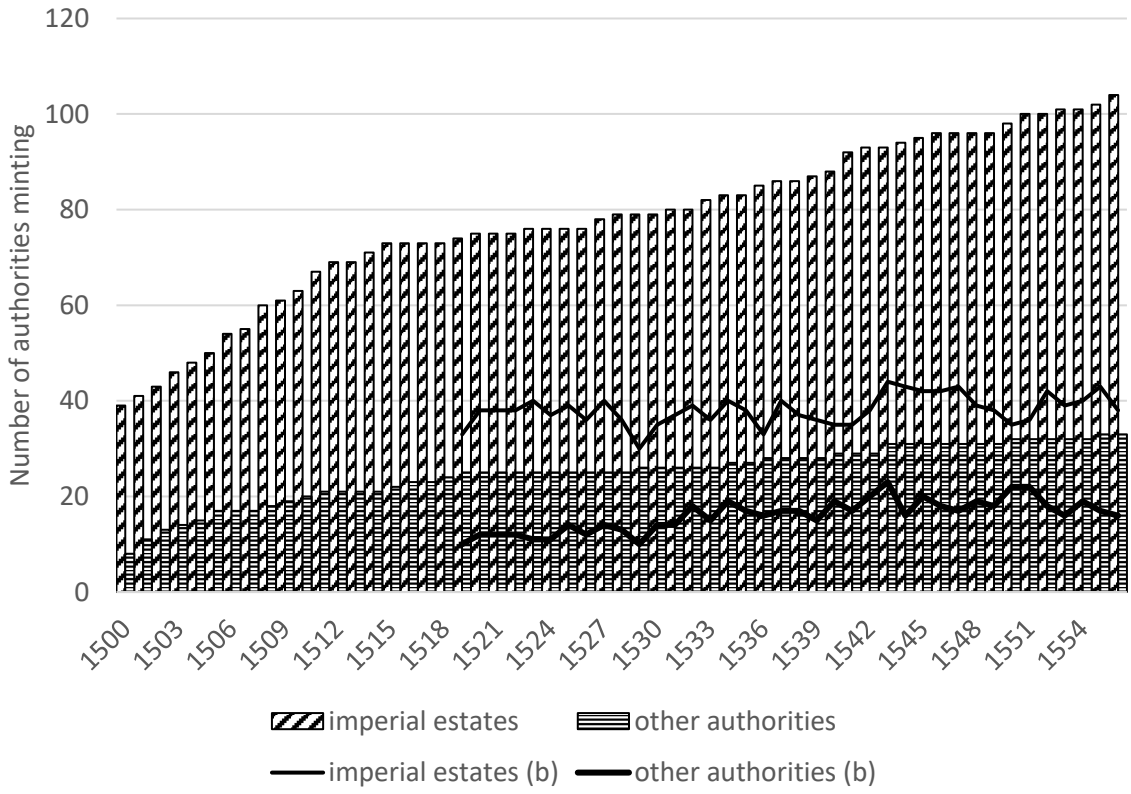
The Holy Roman Empire may have been much less dysfunctional and moribund than nineteenth- and early twentieth-century historians – focused on justifying Prussia's role in destroying the Empire and creating the German nation state – portrayed it,[34] but there is no denying that it was extremely decentralised and that for much of its history, it had money to match. To be sure, originally the emperors had regarded the coinage as their exclusive prerogative.[35] However, there had always been some rulers who did not share this view and minted their own money without imperial consent.[36] Moreover, the emperors began using the right to issue coins in order to reward supporters. From the eleventh century onwards, maintaining monetary uniformity proved impossible.[37]

Determining how many authorities were issuing coins at any given moment is extraordinarily difficult. Figure 1 below gives their number based on the written evidence compiled by Prokisch (the columns) and on the evidence from the dated coins listed in Schulten's catalogue (the lines).[38] In both cases imperial estates and other authorities (such as for example towns that were at least nominally ruled by a prince) are shown separately. As we cannot be sure that mints were continuously issuing coins in every year when written sources report them as 'open', Prokisch's data likely overstate the number of minting authorities. On the other hand, only about a third of

31 Bollandt (1960), p. 322.
32 AHL, Altes Senatsarchiv, Interna 22782 (ASA Interna - Münzwesen - 23/5).
33 Eltz (2001), no. 70, p. 341; cf. Šimek (1971), p. 244.
34 See Scales and Whaley (2018) for a research survey
35 Christmann (1988), pp. 20-21.
36 For example the dukes and electors of Saxony. Schwinkowski (1917), pp. 141, 144.
37 Sprenger (2002), p. 60.
38 Prokisch (1993), pp. 1-244; Schulten (1974).

the coins minted over the period covered by Figure 1 were dated at all. Hence, the data derived from the actual coinage is skewed, as well, though in the opposite direction. At present, we can therefore say no more than that the number of imperial estates that were minting seems to have grown from a few dozen in the early years of the sixteenth century to more than double that number fifty years later.

Figure 1: Authorities minting in the Holy Roman Empire, 1500-1556[39]



Evidently, this diversity was one of the underlying conditions which made the trade in coinage possible that we have got to know in the previous section. However, it was not the only relevant factor. As we have seen, the German lands did not consist of neatly defined currency regions separated by clear and well-monitored borders. Some estates did occasionally attempt to ban at least certain types of coins issued elsewhere, but normally it was up to the consumers to decide whether and on what terms they were prepared to accept money they were offered. Moreover, what applied within the Empire applied to its external borders, too: They were wide open. People, goods and coin crossed them without being hindered, registered or taxed.[40] The Empire's

[39] Prokisch (1993), pp. 1-244; Schulten (1974).
[40] Kindleberger (1991), p. 152.

monetary diversity was therefore not only the result of decentralisation, but also of the import of money from abroad.

Why was that the case? Why did the estates not monitor their borders in order to keep foreign money out of circulation? In principle, this was possible: After all, England did it from the end of the thirteenth century onwards.[41] However, conditions in continental Europe differed drastically from those the English crown had to deal with. Christoph Furer, an influential metal merchant from Nuremberg who submitted a memo on custom policies to the imperial diet in 1523, put it in a nutshell: He explained that attempting to monitor cross-border traffic was futile unless a 'country is closely confined by mountains and waters, so that it is impossible to evade the controls'.[42] The diet was at this time discussing the idea to improve the Empire's fiscal position by creating a common external customs border – a plan Furer opposed. He therefore had a motive to exaggerate the difficulties involved in controlling cross-border traffic, but that does not mean he was wrong. In economic terms, what was relevant were the costs of monitoring trade, and these costs depended at least in part on geographical conditions. England – an island country located at the European periphery, most of whose external trade passed a limited number of ports – faced much lower costs than a largely landlocked country in the middle of Europe like the Empire.

This was not all, though, or rather, low monitoring costs were a necessary but not a sufficient condition for controlling cross-border traffic. Another argument was suggested by Michael von Kuenburg, the archbishop of Salzburg, during monetary policy talks in the late 1550s. Complaining about the export of coins from his territory, Kuenburg stressed that he could not afford having the borders patrolled: 'The world is wide, the people many, the mountains are high, and it will never be possible to plug every single hole'.[43] If this applied to a principality such as Salzburg, where most cross-border traffic had to use mountain passes that were easy to guard, it applied even more to territories that did not only lack the organisational 'state' capacity, as the archbishopric clearly did, but also any natural borders. Stricter controls were not even considered by relatively well-organised authorities. Think of the magistrate of Hamburg that also complained about the export of its own and the import of underweight foreign money – and this despite the city gates being quasi natural points where traffic could at least in principle be monitored at low costs. Still, Hamburg restricted itself to appealing to its citizens' community spirit.

41 Prestwich (1979), p. 471.
42 Kamann (1928), p. 304.
43 Leeb (1999) no. 661, pp. 1721-1722.

There is a simple reason why a lively trade in coinage emerged under these circumstances. After all, rulers had very limited options when they wanted to supply their mint with precious metals. Some were lucky enough to have their own gold or silver mines (as King Ferdinand had in Bohemia, Hungary and the Tyrol), which obviously solved the problem – but they were a small minority. Others depended on their territory producing goods for export, whose total value was larger than that of the goods it imported, or on providing services – for example in the transit trade – for which the subjects of other authorities were willing to pay. In short, they needed a balance of payments surplus that would result in an inflow of precious metal which could be channelled to the mint.[44] A third option was ordering the mint to change the prices it offered for gold and silver depending on which metal it was to attract. If the ruler planned to issue more gold, the mint would offer the equivalent of more silver (in coin) for gold bullion than did the market or foreign mints, and vice versa. The downside was that this meant attracting one precious metal at the expense of the other.[45] If none of this worked, the only alternative was melting and re-minting one's neighbours' money. No wonder, therefore, that historians found that in parts of Germany at least half the metal used by the mints consisted of coins that people like Lepper had collected elsewhere and delivered to have them melted and re-struck as underweight imitations.[46]

None of these problems were new in the first half of the sixteenth century. Borders had always been porous, most minting authorities controlled no precious metal deposits of their own, and most probably did not have a balance of payments surplus either. Still, there was one important change that qualitative sources such as political ordinances or memos reflect. While money had always been used internationally, before the late fifteenth or early sixteenth century long distance trade primarily concerned high-purchasing-power units. This was true for the late Roman and Byzantine Solidus just as well as for the thirteenth-century Florentine Florin, the fifteenth-century ducat of Venice and, at a more regional level, the Rhenish florin.[47] Coins like these provided the backbone of long-distance trade, being accepted in all major markets, and that they were available is one reason why merchants – especially those regularly involved in large transactions – do not seem to have seen a problem in monetary diversity (the other important reason is that long-distance trade relied to a large extent on credit rather than on cash payments).[48]

44 Volckart (2019), p. 25; Sussman (1998), pp. 128-133.
45 Munro (1972), pp. 29-30; Munro (1983), p. 110.
46 Schüttenhelm (1984), p. 165.
47 Dwyer and Lothian (2004), pp. 52-54.
48 Goddard (2016).

What seems to have been a new phenomenon in the late fifteenth or early sixteenth century was that not merely such valuable and generally stable coins travelled over large distances, but increasingly small change, too. This is why in 1511 the electors and dukes of Saxony felt compelled to publish an ordinance that addressed the issue. According to the edict, Saxons had to deal with 37 different types of coins below the size of a *Groschen*, only four of which were domestic. Consumers were expected to be able to correctly identify the non-Saxon pieces they were offered, learn their official values in Saxon money and remember them.[49] There is more evidence that points in the same direction. The *Kreuzer*-imitations from Hildesheim that appeared in Augsburg were no high-purchasing-power coins you could use in long-distance transactions, and neither were the Pomeranian *Schillings* that mints in Mecklenburg used as raw material for their own coinage. In 1553, the government of Lower Austria raised the issue of foreign small change with King Ferdinand:

> 'Most gracious lord, we are herewith sending your Roman Royal Majesty copies of two letters together with a purse of coins from Henneberg, which we have received from your Royal Majesty's councillor and governor of Carinthia, Christoph Khevenhüller, and above mentioned two letters describe how this coinage from Henneberg has flooded Carinthia and is increasing to such an extent that the common man cannot obtain any other money whatsoever, which is a great hardship for the country folk'.[50]

While 'flooded' is no more that rhetoric hyperbole, enough coins from Henneberg (in modern Central Germany) appeared in Carinthia to create a stir. We do not know who transported them over the more than 600 kilometres that separate the two places, but it was evidently worth the effort. When Ferdinand had the coins – which people in Carinthia were using as ½-*Kreuzer*-pieces – tested at the Vienna mint, mint master Andreas Hartmann reported back to him that 'three of these Hennebergers are not more valuable than one *Kreuzer*'.[51] In other words, they contained about 16 to 17 per cent less silver than genuine ½-*Kreuzers*.

Early in the last decade, David Chilosi and I examined a variant of currency trade in fourteenth- to sixteenth-century Germany in depth. We started out from the idea that differences between local exchange rates of coins from all over Germany allowed merchants to turn a profit: A merchant would purchase coins where they were cheap not only because of their low content of pure silver or gold, but also because on that market the supply of this type of coins happened to be large or demand weak. Then he would transport the money to where it was more expensive

[49] Rössner (2012), pp. 381-386.
[50] ÖStA, HHStA Wien, RHR, Miscellanea Münzwesen 2: Münzwesen im Reich, 1551-1564, fol. 443r.
[51] ÖStA, HHStA Wien, RHR, Miscellanea Münzwesen 2: Münzwesen im Reich, 1551-1564, fol. 462r.

and sell it there. The more merchants engaged in this kind of currency arbitrage, the more did exchange rates go up where they had initially been low and fall where at first they had been high. In this way differences between local exchange rates were increasingly eroded, indicating that contacts between markets became closer. What we found was that by the first half of the sixteenth century, differences between local rates in Germany had shrunk further than ever before.[52] Evidently, money was traded across the country at unprecedented and increasing rates. We found integration advanced more strongly between currency markets located in different principalities than between those ruled by the same prince – a discovery which suggests that the growth in the effectiveness of the institutions of the Holy Roman Empire since the late fifteenth century played a key role.[53] If better law enforcement and increasing security benefited currency arbitrage of the type David Chilosi and I were examining, it is plausible to assume that they also benefited transactions of the type in which people like Lepper and Schaller engaged. It was this development that caused the increasing dispersion of small change.

Rulers whose coins served as raw material for the mints of their neighbours suffered a series of highly unpleasant consequences. After some time the underweight imitations replaced the better originals on the markets of their territory, which meant that they tended to turn up in the revenues the authorities collected. In 1521, the duke of Saxony's mint master Andreas Funcke put this bluntly when he explained what consequences an inflow of small change from electoral-Brandenburg would have for his princely employer:

> 'If this unworthy coin is being accepted in your princely grace's lands, your people will suffer palpable harm, and things will become as bad as they were when Brandenburg *Groschens* and other poor coins were circulating …. Also, the *Gulden* is again gone up, and this unworthy coin will drive it up further to 21 *Groschens*. If that comes to pass, the good coins will all be exported and these bad ones alone will stay in the land. Already now all purses are full of bad *Pfennigs*, as your princely grace will discover in your revenues from convoy services, taxes and rents'.[54]

Pomerania, whose money the neighbouring duchy of Mecklenburg and the town of Rostock re-minted into their own coins, was in a similar position. For the Pomeranian dukes this was a problem none the least because of the progress in the protection of internal peace and law that the Empire made in the first half of the sixteenth century. This came at a cost: A supreme court – the imperial chamber court – was set up in 1495, and since 1507 the estates payed a regular tax to the

52 Chilosi and Volckart (2011), p. 769.
53 Chilosi and Volckart (2011), p. 783-784.
54 Bahrfeldt (1895), no. 14, p. 411.

Empire to maintain the judges and assessors.[55] In 1557, the Pomeranian delegates at Empire-wide monetary policy talks in Speyer took up this issue, declaring that

> 'no one must blame my gracious lords of Stettin, Pomerania etc. if their princely graces no longer pay their dues to the Empire and the imperial circle in heavy coin but in those gold and other coins that are current, as they are being collected from the subjects in their princely graces' principalities … because it no longer pleases their princely graces … to lose 4 *Batzens* in every *Gulden*' (the *Batzen* was a 4-*Kreuzers*-piece).[56]

There were further consequences. As the town of Rostock and the dukes of Mecklenburg struck coins that looked much like the Pomeranian originals but contained less pure silver, their mints were able to pay higher nominal prices for their raw material than their counterparts in Pomerania. In consequence, merchants faced strong incentives not only to collect the better coins and sell them to be re-minted, but also to sell raw silver to the mints of Mecklenburg and Rostock rather than to those of Pomerania.[57] No silver supply meant no minting, and no minting meant no revenues from the seignorage. The trade in coinage therefore had unambiguously negative revenue effects which were particularly painful in an age of growing governmental and courtly expenses. Being unable to issue coins with their symbols of authority moreover robbed the dukes of the chance to shape their public image – something their neighbours in Mecklenburg had successfully done since the mid-fourteenth century – and finally, their reputation with their peers able to issue coins was bound to suffer, too.[58]

Solutions: A failure

Solutions were widely and intensively debated among the imperial estates. As we have seen, monitoring borders more closely was no practical option. So what else could one do? One could adapt the standard of one's coinage to that of the underweight foreign money that had come to dominate one's markets. In other words, one could implement a 'defensive' debasement – so called in order to distinguish them from 'aggressive' debasements that John Munro defined as being aimed at increasing revenue. 'Defensive' debasements, by contrast, were designed to protect one's money against being driven out of circulation by underweight imitations.[59] Examining fourteenth-

55 Angermeier (1984), pp. 173-176, 205.
56 Volckart (2017), no. 103, p. 415.
57 Cf. Volckart (2017), pp. LIV-LVI; Rössner (2012), p. 375.
58 Fried (2001), pp. 235-236; cf. Bishop (2016), 766.
59 Cf. Munro (1972), pp. 32-33; Munro (1983), pp. 109-110; Munro (2015), pp. 6-7.

to early sixteenth-century Italy and Germany, David Chilosi and I found that, in particular, urban governments took this measure.[60]

We can observe its effects by looking at how the Upper-German *Batzens* developed. *Batzens* had first been minted by the Swiss town of Bern in 1492, with their official value being 4 Austrian *Kreuzers*. That 4 *Kreuzers* contained altogether about 20 per cent more pure silver than 1 *Batzen* indicates clearly enough what Bern's government hoped to achieve.[61] As Bern's mint could offer a higher price for the raw material it bought than its rivals, its new coin quickly spread over the Swiss Confederacy, Austria, Swabia, Bavaria, Franconia, the Alsace and the Palatinate and to a lesser degree Northern Italy. In about 1510, there were 14 authorities that minted their own *Batzen*-variants; in 1520 25 and in 1535 more than 40. The area where *Batzens* were used was even larger: It reached to the duchy of Prussia on the coast of the Baltic.[62] The coins were issued in large numbers. Bern alone struck more than 850,000 in 1500, the imperial city of Isny almost 700,000 in 1527 to 1531, and the imperial city of Constance almost 2.4 million between 1528 and 1533; all in all, many millions must have been minted.[63] Envisaging the dimensions is easier when we consider how small these towns were. In about 1500, Bern had probably around 3,000 inhabitants; Isny was no larger. With up to 6,000 inhabitants, Constance was the metropolis if the region around the lake that bears its name.[64] Such conditions make it unlikely that the *Batzens* these towns minted were intended for local circulation only. Evidently, most were expected to flow into towns and territories ruled by neighbouring authorities, where they would drive the neighbours' own coinage out of circulation. This was straightforward enough: While each authority used a slightly different *Batzen*-design, all *Batzens* had roughly the same size and weight and circulated interchangeably as 4-*Kreuzers* pieces, regardless of their intrinsic value. Their mere presence was an invitation to engage in the trade in coinage.

We have the results of three tests performed in 1527, 1533 and 1539, which allow us seeing both the consequences of the trade in and melting and re-minting of *Batzens*, and the futility of attempts to get rid of underweight variants with the help of 'defensive' debasements.

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60 Chilosi and Volckart (2017), p. 128.

61 Geiger (1972), p. 145; *Batzens* had a pure silver content of 1.67 grams, Austrian *Kreuzers* minted according to the ordinance of 1481 one of 0.51 grams. Geiger (1968), p. 85; Nagl (1908) , p. 159.

62 Geiger (1972), pp. 146-147.

63 Schüttenhelm (1984), p. 164; cf. Eichhorn (1973), pp. 62-76.

64 Bairoch et al. (1988), S. 67; Keyser (1962), S. 370; Keyser (1959), S. 276;

Table 1: Three early-sixteenth-century Batzen-assays[65]

Place, year of the assay	Number of variants tested	Mean pure silver content (grams)	Average deviation from mean pure silver content (per cent)	Mean debasement since 1492 (per cent)
Regensburg, 1527	12	1.670	1.65	-0.01
Augsburg, 1533	20	1.601	1.60	-4.15
Munich, 1539	8	1.591	1.90	-4.71

While the first decades, when the number of authorities issuing *Batzens* was still small, saw relative stability, the assays of 1533 and 1539 give evidence of a rapid decline. At the same time, the coins became less uniform, as the deviations from their mean pure silver content show. Neither finding is a surprise. Most *Batzens* were issued by authorities that did not control their own silver mines.[66] How were their mints supposed to acquire the large quantities of silver they needed, if not in the form of coins issued by their neighbours? To do this, they had to strike *Batzens* that looked broadly similar but contained a little less bullion. Once these began to dominate, the neighbours, who so far had minted higher-quality *Batzens*, faced strong incentives to follow suit, in other words, to implement 'defensive' debasements, hoping that this would prevent their money from being used as raw material in other mints.[67] However, any such debasement would trigger countermeasures by neighbours still interested in acquiring bullion for their mints. These measures took necessarily the form of debasements themselves – of 'aggressive' debasements, which under the conditions prevailing in early sixteenth-century Germany were less designed to increase revenues than to supply one's mint with bullion in the form of one's neighbours' coins. In this way rounds of competitive debasements followed each other, and the result was the general decline in the *Batzen*-standard that the assayers detected.

Upper Germany was not the only region suffering from competitive debasements. In Lower Saxony, Maria *Groschens* – so called because their design showed the Virgin Mary – occupied the same monetary niche as *Batzens* further south. They had been first introduced in 1505 in the imperial city of Goslar just north of the Harz and were quickly and widely imitated. They, too, were issued in huge numbers: Between 1544 and 1547, for example, Goslar minted almost 3 million of them, Braunschweig between 1543 and 1554 more than 7 million, and Hanover between 1535 and 1544 3½ to 4 million. Göttingen issued more than 5 million between 1545 and 1555,

65 Regensburg 1527: ÖStA, HHStA, RHR, Miscellanea Münzwesen 1: Münzwesen im Reich (2. Konvolut), fol. 240r.-240v.; Augsburg 1533: Thomann von Hagelstein (1692), p. 72; Munich 1539: Lori (1768), p. 217.

66 Eichhorn (1973), p. 76.

67 Schüttenhelm (1984), p. 166.

and Hildesheim about 3½ million between 1542 and 1551.[68] In 1551, an assay in Nuremberg tested 10 variants; Table 2 shows the extent to which they had been debased since Goslar's original had appeared early in the century.

Table 2: Maria Groschens tested in Nuremberg 1551[69]

Minting authority	Pure silver content per piece (grams)	Pure silver content deviation from mean (per cent)	Debasement since 1505 (per cent)
Imperial city of Goslar	0.913	9.7	-37.4
City of Hildesheim	0.899	8.1	-38.4
Town of Braunschweig	0.866	4.8	-40.8
Imperial abbey of Corvey and town of Höxter	0.849	2.7	-41.8
Town of Hanover	0.834	1.1	-42.8
Town of Göttingen	0.827	0.3	-43.3
Imperial abbey and town of Herford	0.776	6.2	-46.8
Town of Hameln	0.776	6.2	-46.9
Duke of Braunschweig-Calenberg-Göttingen	0.765	7.7	-47.7
Town of Northeim	0.744	10.9	-49.1
Mean:	0.825	5.7	-43.6

Maria *Groschens* were even more irregular than *Batzens*: In 1539, the pure silver content of individual *Batzen*-variants deviated from the mean by on average 1.9 per cent, whereas the average deviation of Maria *Groschens* was closer to 5.7 per cent. The only authority listed in the table that controlled its own silver deposits was the city of Goslar, whose mines in the Rammelsberg in the Harz yielded rich returns especially in the first quarter of the sixteenth century.[70] All others had to purchase the raw material for their mints in one way or the other – that is, either as raw silver, or in the form of their neighbours' coins. The degree to which the Maria *Groschens* were debased suggests that the latter option played an important role and that what the assayers found in 1551 was the outcome of rounds of competitive debasements far worse than those from which the South German *Batzens* suffered. This was probably because *Batzens* spread in an environment increasingly dominated by regional currency unions such as the one Ferdinand of Austria negotiated with the Upper-German estates in 1535. These unions either directly prohibited minting them, outlawed the breaking and re-minting of coins in general, or at least tried to ban the circulation of *Batzens*.[71] Any member of a union that violated such a rule would have had to justify its actions in front of the others, which

68 Rüthing (1996), p. 44.
69 Volckart (2017), no. 88, p. 335.
70 Kaufhold (2000), pp. 50-51.
71 Cf. e.g. Hirsch (1756), no. CLXXXIII, p. 271; no. CLXXXV, pp. 274-275.

involved at least some short-term embarrassment and a longer lasting loss of reputation. Obviously few were willing to pay this price. By contrast, in the region where Maria *Groschens* spread, currency unions did not exist. There, it was literally everyone for himself, which explains why the 'defensive' debasements here very quickly turned into rounds of competitive debasements.

Solutions: The drive to monetary unification

The Rhine florin, often called Gold *Gulden* or simply *Gulden* – a product of a regional monetary union the electors of Mainz, Trier, Cologne and the Palatinate had formed in the late fourteenth century – was one of big monetary success stories of the late Middle Ages. As its name suggests, it began its life as an imitation of the golden Florentine florin.[72] Over the early fifteenth century it was debased several times but stabilised from then on and developed into the most widely used gold coin of Central and Northern Europe.[73] By the early sixteenth century, however, the monetary union of the electors on the Rhine was in serious trouble and the minting of Rhine florins had all but ceased.[74] In 1549, the electors explained their monetary policies to Emperor Charles V, arguing that

> 'because of the import of foreign lightweight gold and silver coins that are being spent at high values and in exchange for which the good golden Rhine florins are being exported and melted, we have been unable to let our gold *Guldens* be minted or to issue them in considerable quantities, and if we had minted them, they would immediately have been bought up and put elsewhere into the crucible'.[75]

We have no reason to doubt this statement. About a year later, the imperial diet of Augsburg decided to convene a meeting of assayers and coinage experts in Nuremberg who were to test and analyse all coins current at that time in the Empire (among them the Maria *Groschens* at which we have looked in the last section). The report the meeting submitted to Charles V in May 1551 listed 118 variants of imitations of Rhine florins, two-thirds of which were defective.[76] The assayers singled out one particularly offensive piece: a coin minted by Count Oswald II of Bergh in the Low Countries that did not only contain 25 per cent less gold than it should have done, but of which they noted that it 'looked almost exactly like the Brandenburg gold *Guldens*' issued by Elector Joachim II (which themselves were slightly underweight copies of the Rhine florin).[77] The story is

[72] Berghaus (1965), p. 602.
[73] Nau (1983), pp. 132-156; Chilosi and Volckart (2011), pp. 764-766.
[74] Weisenstein (1995), pp. 176 (composition of coin hoards), 264-269 (mint output, electorate of Trier).
[75] Volckart (2017), no. 84, p. 292.
[76] Volckart (2017), no. 88, pp. 319-326.
[77] Volckart (2017), no. 88, p. 324.

the usual one: the trade in coinage that supplied mints with good coins which they then melted and restruck as base imitations. What was less usual, however, was the reaction of the authorities harmed by this process, in this case the electors on the Rhine. Instead of implementing 'defensive' debasements, their solution was to capitulate and to close down their mints.

They were not the only ones to do so. The dukes of Pomerania were in a similar position. With the mints of Rostock and Mecklenburg offering higher nominal silver prices, they could no longer supply their mints with precious metal. The dukes reacted by making a virtue of necessity. Thomas Kantzow, the Stralsund-born chronicler whom we have met before and who was well-informed about monetary policies, tells how they 'put down the hammer' – as closing a mint was generally called –, 'trusting that one day his imperial Majesty would mandate a common coinage for all German lands'.[78] With this the Pomeranian dukes hit upon the only solution that addressed the root of the problem. What is more, it is likely that they helped triggering a chain reaction. The more estates decided to cease issuing money, the more difficult it would become for authorities that minted imitations to obtain the raw materials they needed to keep their mints in business. There can be little doubt that this contributed to the wide acceptance of the idea that creating an Empire-wide currency was the only way to eliminate the disorder that characterised the monetary economy of the Holy Roman Empire.

A report submitted by King Ferdinand's councillors in 1543 stressed that a 'common, orderly and stable' currency was needed to 'prevent and supress the evil, deceitful and self-interested business' that the diversity of coins allowed.[79] Two years later, the currency committee convened at the imperial diet of Worms argued that 'a just, good, common and well-ordered coinage in gold and silver' would serve to prevent 'self-interested people, who seek their own advantage and have sought and made their own unjust profit, from doing business with the irregular and uneven coins'; this would be 'to the benefit of all persons of upright and honourable spirit'.[80] Or as the delegates of the elector Palatine put it on another occasion: 'One thing is certain: When all estates mint according to the same standard that they faithfully observe, the melting and re-minting of coins is impossible because it can no longer be done without incurring a loss'.[81] In particular, a common currency would prevent 'abusing other minting authorities' seals, coats of arms and coinage designs' – issuing imitations would no longer be possible.[82] In sum: 'A uniform, good, even and stable

78 Böhmer (1835), p. 164; cf. Krüger (2006), p. 40.
79 Eltz (2001), no. 70, p. 339.
80 Volckart (2017), no. 86, p. 960.
81 Volckart (2017), no. 100, p. 405.
82 Aulinger (2003), no. 86, pp. 959-960.

coinage' had to be created, 'so that debasements and also the great damage, harm and deception done in the trade in coinage were averted and in future prevented, and the common weal thereby greatly advanced'.[83]

Regional monetary unions formed since the late fourteenth century had pursued the same aims. Take, for example, the coinage confederacy that emerged in the upper Rhine region at the beginning of the fifteenth century and that eventually merged with Ferdinand of Austria's Upper German union of 1535.[84] The introduction to the treaty that constituted the union stated explicitly why the Austrian bailiff of the Alsace, the city of Basel and the towns of Freiburg, Colmar and Breisach had decided to cooperate: It was

> 'in order to prevent and avert the large and notable ills from which gold and silver coins previously minted suffer, which are now being melted and have become poor; also because of the intruding foreign coins that have harmed this land and people and continue to do so'.[85]

The treaty that renewed the union in 1498 stated that 'after many diets held in previous years because of the intrusion of coins that foreign and domestic persons have brought in and imported, which has caused noticeable harm and damage to these lands and to the common man', a debasement had finally become unavoidable.[86] What was new in the first half of the sixteenth century, and what was evidently a consequence of the increasing integration of currency markets that allowed ever larger quantities of ever less valuable coins to be traded over great distances, was the idea that regional monetary unions would no longer be sufficient to address the problem. Now, an Empire-wide common currency was needed.

Conclusion

We have now arrived at a better understanding of why monetary unions were formed in the late Middle Ages and the sixteenth century. I do not want to discount the possibility that some poorly documented medieval unions were intended to help trade and economic integration, but at least some fifteenth century unions, and most definitely the Empire-wide one the imperial estates agreed at the diet of Augsburg in 1559,[87] served an entirely different purpose. They were designed not to

83 Aulinger (2003), no. 87, p. 962.
84 For the Rappen-union see Cahn (1901).
85 ÖStA, HHStA, Reichshofrat, Miscellanea Münzwesen 2: Münzwesen im Reich, 1551-1564, fol. 522v.
86 ÖStA, HHStA, Reichshofrat, Miscellanea Münzwesen 2: Münzwesen im Reich, 1551-1564, fol. 501r-501v.
87 Leeb (1999), no. 804, pp. 1953-1988.

help trade, but to prevent it, or at least to prevent one form of trade: the trade in coinage. As a matter of fact, there does not seem to be any evidence at all for merchants favouring monetary harmonisation over diversity – unsurprisingly maybe, when we consider that most were able to deal as effectively with the multiplicity of currencies as with the use of different systems of weights and measures, and that some at least actually profited from the trade in coinage. It was not them who lobbied for a common currency; it was the authorities themselves who were harmed by the effects of Gresham's Law, and it was this harm that convinced them to give up the chance to benefit from monetary manipulations in favour of a common currency.

It has now become clearer, too, why Lars Boerner and I found that fourteenth- to early sixteenth-century monetary unions tended to emerge in regions whose markets were already relatively well-integrated. As mentioned above, our idea had been that disputes about the seignorage would prevent weakly integrated towns or territories from joining monetary unions. In fact, there does not seem to be any direct evidence for such disputes. To be sure, the negotiations about the Empire-wide common coinage were long dominated by the issue of the price of silver that many estates wanted to harmonise before agreeing to the monetary union,[88] and this price obviously impinged on the seignorage. However, as we have seen the evidence pointing to Gresham's Law and its effect as a motive for harmonising the coinage is far more direct and compelling. Moreover, we know that currency markets in the Empire became significantly better integrated in the course of the fifteenth and early sixteenth centuries. It was this development that made the regional unions that had proliferated in the late Middle Ages unviable: They were no longer sufficient to address the problem; moreover, with the increase in currency market integration, they came under increasing pressure from the trade in coinage. This is the real link between market integration and the emergence of monetary unions.

[88] See e.g. ÖStA, FHK – Alte Hofkammer – Niederösterreichisches Münz- und Bergwesen, Akten 01, fols. 119r.-38v.; Eltz (2001), pp. 330-331, 321-322, 337.

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