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Seen But Not Noticed. The Role of Comparisons in Economic Sociology

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1 Introduction

Comparisons are an essential operation of market activity: every market exchange is based on a comparative evaluation of goods and runs into problems when goods are considered as incomparable or singular.**1** To sell a product, producers must distinguish it from other comparable products, and to decide on buying it, consumers have to be able to assess its quality in relation to other goods.**2** Only when the product properties are considered as characteristics that exist independently from the judgment of the participants, will market exchanges run smoothly. Yet as Callon et al. (2002) and others have shown, the assumed objectivity is not naturally given but the result of a process of social construction that is no longer recognized as such. If such objectified comparative criteria are lacking, assessing the quality of goods becomes problematic (for an overview, see Beckert and Aspers 2011; Beckert and Musselin 2013a).

We assume that quality uncertainty is above all a problem of failed comparisons. It arises when the comparative criteria are ambiguous or controversial or when there are no procedures and techniques for applying the criteria to the individual case. We distinguish five constellations that may lead to quality uncertainty: 1. *The problem of classification*: Quality uncertainty may emerge when it is difficult to decide whether a product falls into an established category or when categories are fuzzy (e.g., Hsu, Hannan, and Koçak 2009). 2. *The problem of novelty*: Similar problems arise when comparative criteria are not yet available because the product has only recently been introduced in the market (e.g., Rao 1994). 3. *The problem of singularity*: The same applies to products whose value is difficult to ascertain because they are considered to be unique or "singular" (e.g., Karpik 2010). 4. *Experience goods*: Quality uncertainty may also occur when the value of a good or a service can be assessed only by using or consuming it (e.g., Kovács and Sharkey 2014). 5. *Social goods*: Finally, quality uncertainties arise when the worth of a good depends largely on the value it has for other consumers (e.g., Zuckerman 1999). In all other cases – in what are referred to as "standard markets" – the problem of quality uncertainty is at least temporarily solved.

Although market processes are essentially comparative processes, the term "comparison" is only incidentally used and even less clearly defined. More frequently employed is the concept of "commensuration": "Commensuration is the expression or measurement of characteristics normally represented by different units according to a common metric.... Commensuration transforms *qualities into quantities*, difference into magnitude" (Espeland and Stevens 1998, 315-316, authors' emphasis). Yet the concept of commensuration is too narrow to capture the meaning of comparisons. Every evaluation presupposes that the objects to be evaluated are seen as comparable, but not every comparison can be equated with quantification. To identify the quality of different wines, no measurement is needed but it is nevertheless possible to rank wine according to certain evaluative criteria. "Comparison" is, in other words, more general than "commensuration." It enables us to understand quantification as a special case in the broader process of making things comparable. For this reason, we propose that evaluation processes be considered primarily as comparative processes and to ask only in a second step whether the comparison is based on measurement.

In the following, we develop this argument in more detail. In section 2, we propose a definition of comparison and illustrate its suitability by referring to studies on the introduction of new product categories and on the evaluation of goods. In the third section, we test the productivity of this perspective using the example of grain markets which are considered the epitome of a standard market. We demonstrate that the standardization and the subsequent globalization of the grain market in the nineteenth century depended on the solution of the comparative problems that earlier grain markets were confronted with. Finally, we summarize our arguments and draw some conclusions.

2 What are comparisons?

Comparisons are a constitutive element of social order. Markets are based on a comparative evaluation of the quality of goods and run into problems when products or services are deemed incomparable or unique. Similarly, comparisons are also essential for stratification. Actors define their position in the social space in comparison to the positions occupied by other actors and make their positions visible through practices of cultural distinction (Bourdieu 1984). Even globalization rests on comparative practices. Globalization is usually defined as an increase in structural ties (see, e.g., Guillen 2001) but it is also caused by worldwide comparisons that link units formerly not considered as being connected (Heintz and Werron 2011). International university rankings are a well-known example for this globalization from comparisons.

Today, comparisons are a ubiquitous phenomenon. States are compared according to their debt ratio, employees with respect to their performance, and products and services in terms of their quality and price. Whether buying a car or selecting a wine, choosing a university or granting a loan, all these decisions presuppose comparisons and require comparative information. But, despite the ubiquity of comparisons in everyday life, they have rarely been focused on. Certainly, comparisons are widely discussed in sociology, but mostly as a *scientific method*, not as a social phenomenon in *its own right*.[3]

What are comparisons? What do we do when we compare laptops, politicians, or holiday destinations? Comparisons are, generally speaking, cognitive tools that enable us to observe entities and performances according to their differences or similarities (Heintz 2016). Typical comparative statements are, for instance, "she is taller than her brother", or "candidate A and candidate B are equally well suited to our firm". To make such a statement two operations are needed.

First, to compare entities we have to conceive them as comparable, i.e., as belonging to the same *category*. To take the example above, the entities have to be seen as an element of the category "sibling" or "applicant." Whether or not different entities are regarded as being categorically equal, is not based on their inherent characteristics but is historically contingent. Phenomena that historically have been considered as lacking any commonality may later be judged as belonging to the same category.

Second, comparing requires *comparative criteria*, procedures, and techniques to enable us to observe the differences or similarities between the units regarded as comparable. For example, to compare and rank universities you need comparative criteria such as scientific reputation, external funding, or student to faculty ratio, as well as measurement methods to determine the academic excellence of each university.

However, comparisons are not only a technique for observing differences, they also create *"cultural linkages"* (Strang and Meyer 1993) between the units compared. By observing entities according to a common comparative criterion, comparisons establish connections between entities that may not previously have been considered as related. The history of the grain market is a good example of this relational quality of comparisons (see in more detail section 3). In the eighteenth century, grain markets were still a strictly local affair. As the comparative criteria and measures varied from place to place, every local market had its own way of assessing the quality of grain. For merchants abroad, it was not feasible to compare offers across different marketplaces.[4] Only with the development of standardized criteria and measuring techniques did it became possible to link the offers from various marketplaces and to evaluate them against each other. This development, together with the invention of the telegraph in the 1850s allowing rapid transmission of information, led to globally interrelated marketplaces.

Thus, comparing includes two steps that are empirically interwoven but should be distinguished analytically. First, entities, whether physical objects, goods, services, or social actors, have to be considered as comparable, that is, as belonging to the same category. Only then does it make sense to observe them according to their differences or similarities. This requires, second, a comparative criterion – a *tertium comparationis* – to observe the differences or similarities between the units regarded as comparable. The operation of comparison establishes linkages between the units compared that may beforehand not have been perceived.

The usefulness of a precise definition of comparison can be illustrated with two research areas in market sociology: the emergence of new product categories and the valuation of goods. Both are particularly well suited to illustrating the interplay between the two processes we have distinguished.

Making up goods. The problems firms face when they introduce a new product or product category illustrate that every comparison presupposes a prior categorization. A new product is usually categorically ambiguous and lacks a clear identity. To become successful in the market, it must acquire a distinctive meaning that separates it from adjacent products: the similarities between its elements must be deemed more significant than the differences. In his seminal article on categorization, Eviatar Zerubavel (1996) called these two sides of categorization "splitting" and "lumping". "Whereas lumping involves overlooking differences within mental clusters, splitting entails widening the perceived gap between them. Thus, while playing down intracluster mental differences, we also exaggerate intercluster ones" (Zerubavel 1996, 424).

If this process of sensemaking and distinction fails, comparisons, and therefore evaluations, become difficult or even impossible. The connection between categorization or classification and evaluation is highlighted by a number of studies investigating the problems of introducing new products and the strategies adopted to solve those problems. Examples are the invention of the "automobile" at the end of the nineteenth century (Rao 1994), the introduction of the "minivan" in the 1980s (Rosa et al. 1999), the creation of "light cigarettes" (Hsu and Grodal 2015), or the emergence of "satellite radio" (Navis and Glenn 2010) as new product categories. How can we evaluate a product that does not easily fit into established categories? And how to make sense of a good that has properties nobody has known before?

The microwave is a case in point (Ormrod 1994). Originally, it was launched as a "toy for the boy" and sold in electronics departments as a "brown good." This kind of marketing entailed uncertainties for consumers: what were they to make of a device that was sold in the electronics department and looked like an amplifier but was advertised as a new kind of oven? Only after the microwave was launched as "white good" and presented in the home appliance departments did it acquire a fixed identity and become a market success. This example illustrates what Zuckerman (1999) referred to as "categorical imperative." To compare and evaluate the quality of goods they first have to be categorized. If the categorization fails, the goods violate the "categorical imperative" and risk not being competitive in the market.

Yet even when a product has acquired a clear identity there may still be the problem of assessing whether it fits into a specific category. For instance, fair trade coffee is indisputably "coffee" but how can we be sure that it is traded according to fair trade standards and therefore belongs to the category of fairly traded coffee (Gourevitch 2011)? That means, a distinctive identity is not enough. Additionally, transparent indicators must be available to help the consumer decide whether the products at hand belong to a common category or not.

Valuing goods. Categorization is only the first step. Once products are considered to be part of a common category it is possible to compare and evaluate them (for a similar distinction, see Phillips and Zuckerman 2001, 383; Beckert and Musselin 2013b, 2-4). To assess quality differences, you need comparative criteria as well as procedures and techniques to determine the specific quality of an individual product. To compare the suitability of job applicants it has to be specified what "qualification" means for the advertised position and how to judge whether an applicant matches the criteria (Rivera 2015). In standard cases the evaluation is easily made. Problems arise when the comparative criteria are vague or not generally accepted or when no clear-cut practices exist to make these criteria operational and applicable to the singular case. Well-known examples are the decision-making problems faced by assessment committees in architectural competitions (Kreiner 2012) or the problems that arise when a previously unknown product enters the market (Rao 1994). It is important to note that these uncertainty problems are not caused by the specific properties of the product but stem from the lack of precise comparative criteria and procedures (see next section for more detail).

Hence, in order to overcome the problem of quality uncertainty, shared comparative criteria and evaluation techniques are needed. Third parties – critics, public authorities, specialized journals, and popular media – play a decisive role in this regard: they are the ones who specify the evaluative criteria and also often carry out the evaluations and make them publicly available (see Bühler and Werron 2014).5 Today, rankings, ratings, reviews, test reports, quality labels and certifications, are the most prominent forms of "judgment devices" (Karpik 2010, chap. 5). They offer either comparative judgments (rankings and ratings, see Heintz 2018) or set a standard that a product has to meet to qualify for "high quality" (quality labels and certifications).

In the next section, we will expand on our considerations on the significance of comparisons using the history of the

grain market as an example. We will show that the concept of comparison helps us to understand how the grain market changed from local markets of singularities in the eighteenth century to a global standard market during the nineteenth century.

3 From singularities to standards: grain markets in the eighteenth and nineteenth centuries

The contemporary grain market is a classic case of a standard market. Buyers and sellers use standardized evaluative criteria and measures to assess the quality of grain. The properties that the quality assessments "detect" are deemed to be inherent characteristics that exist irrespective of the market participants' judgments (Aspers 2009, 114-116). There appears to be no quality uncertainty at all. However, as Callon et al. (2002) have shown, quality uncertainty is intrinsic to all markets, even to typical standard markets like grain or cotton markets (Beckert 2014, 207-212). Standard and singular goods do not differ according to their inherent characteristics as Karpik (2010) seems to assume but with regard to their taken-for-grantedness. For Callon et al. (2002), the seemingly objective properties of a product are established in a collective process of social construction through which qualities are attributed and (temporarily) stabilized. That a car, for instance, is evaluated with regard to its environmental impact, its fuel consumption, and its motor power is not naturally given but the outcome of a social and often highly controversial process that fixes the (selective) attributes a high-quality car has to have. Which attributes are established as defining characteristics and whether they are seen as self-evident attributes depends largely on the procedures available for assessing the quality of goods.

The market for grain is a particularly good example to show how this process of objectivation works (for more detail, see Bühler 2017). At the end of eighteenth century, grain still exhibited all the properties that Karpik (2010, 10-13) attributes to singular goods: multidimensionality, quality uncertainty, and incommensurability. However, by the end of the nineteenth century this had fundamentally changed. Grain had become a standard product with supposedly objective properties. On the following pages, we describe how this transformation took place and what obstacles had to be overcome. We will show that one of the main problems was the lack of widely shared evaluative criteria and procedures to assess the quality of grain.

In 1834, a parliamentary enquiry into the *Sale of Corn* in England arrived at four aspects that were required to reliably determine and compare grain offers: quality, quantity, condition, and current prices (House of Commons 1834, viii–ix). Yet this neat list underestimates the practical problems faced by market participants when comparing different offers. The list was the outcome of a meticulous interrogation of different market actors and rather a request for future policies than a description of current practices.

Even in the 1830s, there were still neither evaluative criteria that transcended the local marketplace nor shared procedures to measure the properties of grain "objectively." Indicators for assessing quality were multidimensional and the quality and condition of grain had to be examined personally by the buyer, relying largely on his sensual experience of the grain at hand.

In view of this situation, how was quality assessed? For buyers, high quality was primarily indicated by dryness, weight and color. Generally, the drier, heavier and lighter the grain was, the more and the better flour it would supposedly yield. However, these properties did not provide information about the condition of the grain. A wet and dirty sack of wheat was heavier than a dry and clean one, and damp grain clogged the millstones. Therefore, buyers used additional criteria, particularly cleanliness and purity, to assess the quality of grain. High-quality grain should be free from other kinds of grain and contaminants such as stones or dirt and also devoid of defects such as mold or insect damage. An observer of grain markets at the time reports that the highest qualities were "light yellow or grayish with an almost translucent appearance, slightly convex with a shallow groove, and thin-shelled but hard, weighty, and dry," whereas lower quality wheat "seemed dirty, was somewhat speckled, lacked vivacity, and was longer, thinner, lighter, and burdened with an extremely thick seedcoat that indicated a superabundance of bran" (cit. Kaplan 1984, 52).

But how are vivacity, dampness, or cleanliness reliably determined? An experienced corn merchant told the members of the parliamentary enquiry that one evaluated grain "[b]y looking at it, by smelling it, and by handling it" (House of Commons 1834, 118). In the absence of unambiguous indicators and uniform procedures to identify different wheat qualities, market participants had to use their senses and bodily knowledge to examine and compare grain offers. Prospective buyers weighed a handful of grains in their hands, tasted and chewed them, and lis-

tened to the "ring" as they tossed them back into the sack. A "fruity taste" which "charmed the tongue" and an "agreeable odor" hinted at good qualities and the absence of insect infestation or diseases (Kaplan 1984, 52). The procedures to evaluate the quality of grain were by no means neatly divisible, but were rather intermingled. By handling and tasting, buyers simultaneously observed "vivacity" and "convexity" as well as dampness. Each market participant had his own techniques for assessing the quality and condition of grain and the quality of his judgment depended essentially on his personal experience and practical knowledge.

The only seemingly objective criterion was density, indicated by the weight per given volume, or what was referred to as "natural weight" (Kaplan 1984, 52; Velkar 2012, 75, 201-208). For assessing the natural weight, the grain was poured into a measuring vessel, for example a "bushel," and weighed with a set of scales. The higher the weight of the bushel, the higher the quality of the grain was expected to be. Yet the use of natural weight was problematic in at least two regards: not all marketplaces used natural weight measurements. Generally, only one measure was used, either volume or weight. It was therefore only possible to specify the quantity of the grain, but not its quality. Further, and even more importantly, the measures were not yet standardized. Although the authorities repeatedly tried to homogenize measures, local practices still persisted (Sheldon 1996). Arthur Young, an observer of grain markets in England and on the continent, reports in the late 1780s that "[t]he infinite perplexity of the measures exceeds all comprehension…. They differ not only in every province, but in every district, and almost in every town" (cit. Kaplan 1984, 87). Therefore, market participants could only capture the relative quality of local offers but could not compare them across different marketplaces.

In sum, in the late eighteenth and early nineteenth century, grain markets were geographically limited and still very local affairs. To buy and sell grain market participants had to be physically present at the same place and the same time. As they could not yet draw on objectified evaluative criteria and delocalized measurement techniques, they had to assess the quality of grain by tasting and handling it and by relying on their eyes and ears. The comparative criteria and measures they used neither spanned different marketplaces nor were they shared among all market participants. Instead, each market actor had to draw his own conclusions based on his sensory examinations of the products at hand. This is the main reason why grain markets of the late eighteenth century were more similar to a market of singularities than to the standard market they became during the nineteenth century. Grain was not a "singular good" because of its specific properties but because translocal and shared devices to assess grain qualities were not yet available.

In the mid-nineteenth century, the *Board of Trade of Chicago*, today one of the major futures and options markets, but originally an association to promote business in Chicago, issued quality classes for grain that were permitted in the city. Wheat, for example, was divided into three classes: "white winter wheat," "red winter wheat," and "spring." Soon, these classes proved to be insufficient because they did not distinguish between dirty or sprouting grain and cleaned and dry grain. Accordingly, the board refined the initial quality classes. The quality class "spring," for example, was subdivided into "No. 1 Spring," "No. 2 Spring," and "rejected spring" (Cronon 1990, 116-118). To be classed as "No. 1 Spring," the highest quality spring wheat, "[t]he berry [had] to be plump, well cleaned, free from other grains, and to weigh not less than 59 lbs. to the measured bushel." The next quality, "No. 2 Spring," had "[t]o be sound, but not clean enough for No. 1, and to weigh not less than 56 lbs. to the measured bushel." The last quality, "rejected spring," encompassed "[a]ll unsound, unmerchantable Spring Wheat, and [had] to weigh not less than 45 lbs. to the measured bushel" (Chicago Board of Trade 1860, 13). The establishment of quality classes was a departure from earlier ways of evaluating grain. While, in the eighteenth century, the evaluation relied on personal experience, since the mid-nineteenth century, grain merchants have been able to use conventionalized criteria and unambiguous indicators to describe the quality of wheat offers. Personal evaluation was relegated to expert grain inspectors, and corn trade associations appointed standardizing committees which both utilized technical devices and "objective" procedures to grade grain. This development enabled absent merchants to compare various offers from foreign places and to choose the one that suited them and their customers best. In the course of this process, grain transformed from a "singular good" to a homogeneous product divided into different quality classes.

With the invention of quality classes based on common comparative criteria and distinctive indicators, market actors, especially in the United States but also in the United Kingdom, responded to problems arising from cheaper

modes of transportation, new grain storage facilities, and the influx of increasing amounts of grain. In the United States, the invention of quality classes was a reaction to railway transport and steam-powered silos, known as "grain elevators" (for an account of the U.S. case, see Cronon 1991, 97–147; Hill 1990; Velkar 2012, 171-217). To utilize all available storage space in the elevators and to shorten the time needed to haul grain into the freight cars, grain from different farmers was poured into single elevator bins. This practice was highly problematic because, by mixing grain from different producers, individual characteristics were lost. Farmers were afraid of lower returns, millers of decreasing quality, and merchants of losing reputation and profit. As a reaction, the *Board of Trade of Chicago* issued standardized criteria to evaluate grain, particularly wheat, and specified indicators.

At first glance, the criteria to evaluate grain seem quite similar to the ones used in the eighteenth century: time of sowing, color, cleanliness, purity, and weight-per-volume requirements. So how did they differ from earlier evaluations of grain quality? First, only a limited number of evaluative criteria were specified and they were published on behalf of all interested parties. Quality evaluation was no longer left to the multidimensional sensual evaluation of buyers but became partially standardized. Second, the Board of Trade of Chicago fixed a set of distinctive indicators to make the criteria operational. Buyers no longer had to ponder whether the grain was "translucent," "light yellow," or "grayish." Just "white" or "red" and the time of sowing –"winter" or "spring" – was sufficient. Vague criteria such as "vividness," "convexity," or "shallowness of groove" were not included in the definitions.

The difference between the United States and England was primarily in the determination and usage of grain categories. While, in the United States, the criteria were fixed in advance and without checking the seasonal harvest beforehand, in England the grain was evaluated after delivery. This was done by using what were known as "standard samples" (for an account of the English case, see Fuchs 1890; Velkar 2012, 171-217). Special committees compiled these samples and measured them. The resulting samples and the corresponding weights were valid for a certain period of time, e.g., a few weeks or until the next harvest. At the turn of the century, the London *Corn Trade Association* assembled samples for all grain delivered to Great Britain and the continent (Forrester 1931, 202).

Nevertheless, in London as well as in Chicago, certain criteria still depended on personal evaluation. "Plumpness" and "cleanliness," for instance, were still not measurable but had to be determined by sensory evaluation. Now, however, potential buyers did not evaluate the grain offers themselves. Elected members of corn trade associations defined the quality of "standard samples" and grain inspectors graded grain into the quality classes when it was delivered to the elevators.[6] Both were certified, the one through election, the other through training and official certification (Cronon 1991, 118-119). Because they were seen as disinterested experts, led by an "ethic of personal renunciation" (Porter 1995, 85), their judgments were considered objective.

The idea of being able to objectively determine grain quality was reinforced by the invention of standardized measuring instruments in the second half of the nineteenth century. While, in the eighteenth century, the measured weight varied depending on whether grain was poured into the vessels from shoulder- or hip-height or whether the measure was shaken or "heaped" (see Kula 1986, 44-49; Velkar 2012, 203), in the nineteenth century, this problem was solved by the introduction of technical instruments. The weighing process was automated and the elevator operator had simply to read the scales, open the chute, and let the grain flow into the appropriate bin (Cronon 1990, 111). Since the late nineteenth century, additional instruments and measuring methods have been invented, e.g., the "grain trier" and the "Boerner divider" to draw standardized samples, the "Emerson wild oat kicker" to assess the purity of wheat, or the "Brown-Duvel moisture tester" and the "Tag-Heppenstall meter" to determine dampness. The "Tag" measured the flow of electricity through the tested grain and, using conversion charts, the measurements were interpreted as moisture content (Hill 1990, 229-235). These technical instruments represent a paradigmatic case of producing "mechanical objectivity" and they even worked as "inscription devices" (Latour 1988) aimed at the elimination of personal judgment and the inescapable subjectivity of human observation (Daston and Galison 1992; Porter 1995, 47-48). The goal was a measurement that was completely decoupled from any personal intervention.

Since the beginning of the twentieth century, the question of whether standardized categories and technical instruments were appropriate to evaluate grain, was settled. The challenge was now how to make them more accurate and more suited to the different needs of the heterogeneous

actors in the grain market (Hill 1990, 136-7, 185-250; Velkar 2012, 210-215). Merchants preferred fewer criteria and broader quality ranges so that various grains fitted into the classes. For quality-sensitive buyers such as millers or bakers, on the other hand, the narrower the classes, the better it suited their purpose. Sometimes the controversies could be settled rapidly but sometimes they endured for a considerable time. Even today, there are no globally standardized quality classes, and regulations for evaluating grain quality differ from region to region. Yet due to the standardization of the evaluation process, regional criteria and techniques are convertible, enabling the comparison of various grain offers from different origins.

Although scientists and UN organizations tried to agree upon internationally homogeneous quality classes, this has not been accomplished to this day. There are still different quality categories in use and the regulations for evaluating grain quality differ from region to region (Hill 1990, 97-98, 185-250, 272-275; Velkar 2012, 194-215). Yet, since the nineteenth century, merchants' handbooks such as, for example, Rudolf Sonndorfers ([1880] 1882) *Usancen und Paritäten des Getreidehandels im Weltverkehre* have listed the different criteria and indicators and explained how to convert them. These conversion tables enabled prospective buyers to translate different quality measures and to compare them against each other.

To sum up, the standardization of evaluative criteria and their interconvertibility were crucial prerequisites for global grain markets. Yet the solution of the comparative problems the early grain markets faced was of course not the only reason for the emergence of a globalized grain market. Cheaper and more reliable transport and swifter communication due to the electric telegraph and the laying of submarine cables were additional preconditions (Bühler 2017, chap. 6). Moreover, and driven by these transformations, market participants' interpretation of their situation changed fundamentally. The market was now seen as an anonymous affair where potential competitors – "real or imaginary" (Rothstein 1960, 408) – could be located anywhere on the planet. For submitting or evaluating offers, the market participants could now turn to the latest information from globally observed "world marketplaces" such as Chicago or New York. The fluctuations on these marketplaces indicated the existence of a global and anonymous market public that had to be taken into account before making the decision about the price at which one should offer or buy grain.

Conclusion

The aim of this article was to demonstrate that a precisely defined concept of comparison is a *sine qua non* for the sociology of markets. In the first section, we proposed a definition of comparison and illustrated its explanatory power using two well-known examples from economic sociology. In the second section, we turned to the history of the grain market. We showed that the solution to the comparative problems faced by the traders and sellers of grain in the eighteenth century was an indispensable prerequisite for the globalization of those markets. These problems principally stemmed from the absence of comparative criteria and measurement techniques that could be used across different marketplaces. To evaluate the quality of grain, the prospective buyers had to personally examine the grain offered by tasting, smelling, and handling it and the few measurement instruments available at that time, primarily scales and standardized vessels, varied from place to place. Only with the standardization of the evaluative criteria, the homogenization of measures, and the invention of new measurement techniques did it become possible to overcome the quality uncertainties of the early grain markets.

The endemic quality uncertainty of the early grain markets is the reason why we argued that these markets were more similar to a market of singularities than to the standard market it became later. This thesis is in accordance with the perspective of Callon et al. (2002) but differs from Karpik's (2010, 30) view that singular goods are "an irreducible reality," a separate kind of product. Yet, the "naturalness" of ascribing quality to certain products, and of denying it to others, has nothing to do with a difference in their intrinsic characteristics but is a result of a consensus that was reached after long controversies and instabilities. Today, we are no longer concerned with the quality uncertainty of milk or oats, for example, but in the past, milk or oats may have been "singular goods" whose characteristics were far from taken-for-granted and where it had not yet been decided which properties were the most relevant quality indicators.

Our assumption that comparisons are a decisive factor in understanding market dynamics seems trivial. However, if we examine the plethora of studies that deal with market uncertainties, it appears less so. Although the significance of comparisons is often implicitly assumed, "comparison" is only rarely used as a theoretical term. Comparing seems to be so common and self-evident that nobody cares to

think about what comparisons are and how to define them. If one makes the effort to think about comparisons in a more analytical way, however, one quickly realizes that comparing is a very complex process, and certainly more complex than categorization or compiling a list (Heintz 2016, 308-309). Comparing involves two steps that are interlocked. First, to compare, the entities have to be considered as belonging to the same category. The "lumping" of objects into the same category is far from natural. It is not at all self-evident neither for business nor biological contexts to subsume wheat, barley, oats, or quinoa under the same category of "grains". Yet categorization is not enough. In a second step, comparing requires comparative criteria to assess the differences or similarities. These two operations are involved in every market exchange but are generally not analytically distinguished. Research that addresses the classification of products focuses on the first element, while studies that examine the evaluation of goods bring the second step to the fore. If one considers these steps as two sides of the same comparative process, the two research areas can be empirically linked more easily and, at the same time, can be analytically distinguished in a more precise manner.

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Endnotes

1We focus on the comparative evaluation of qualities, not prices. For the difference between "valuation" and "pricing," see Aspers and Beckert (2011, 27-32).

2We use the terms "product" and "good" (or "services") interchangeably. For a differentiation, see Callon et al. (2002, 197-198).

3There are only a handful of studies analyzing comparisons as a ubiquitous social practice (see Epple and Erhard 2015; Heintz 2010, 2016; Luhmann 1995; Steinmetz 2018).

4This did not prevent long-distance trading (see Pelizzon 1994; van Tielhof 2002) but it explains why trading was not an anonymous affair but relied on trustworthy persons, family members, or personal acquaintances who settled the transactions on-site, see, for example, Gestrich (2011).

5Blank (2007) distinguishes between two types of evaluation by third parties: connoisseurial reviews and procedural reviews. In connoisseurial reviews the evaluation is based on a personal evaluation, exemplified by book reviews, articles, or reports by restaurant critics, while procedural evaluations employ standardized measuring and testing procedures.

6In disputes, particularly when the delivered grain did not match the quality expectations, corn trade associations provided arbitration. On this, see Petersson (2009, 217-229).

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