DISCUSSION – DISKUZE

A few notes in the defence of the Great Moravian market system

Několik poznámek na obranu velkomoravského tržního systému

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The recent text by J. Macháček (in print) attempts to review the debate concerning the nature of the relationship between Great Moravian centres and their hinterlands. Among other points, it also criticises the model of the Great Moravian market system that I originally developed as part of the wider economic, geographic, and political model of the Great Moravian polity (Hlavica 2023). In the following text, I will analyse Macháček's key arguments and highlight the problematic conclusions on which he bases his position. Additionally, I will point to the grounding of the author's criticism in an incomplete understanding of certain economic and anthropological concepts. My primary aim is to demonstrate that his criticism of the Great Moravian market model is insufficient to warrant its rejection.

Great Moravia – market system – trade – centres – hinterland – food production

Nejnovější text J. Macháčka (v tisku) si klade za cíl přezkoumat debatu o vztahu velkomoravských center a jejich zázemí. V souvislosti s tímto záměrem kritizuje i model velkomoravského tržního systému, který jsem ve své práci představil coby součást širšího ekonomického, geografického a politického modelu velkomoravské společnosti (Hlavica 2023). V následujícím textu se pokusím podrobně zaměřit na analýzu Macháčkových klíčových argumentů a poukázat na problematické závěry o podstatě ekonomických vztahů na Velké Moravě, na nichž staví svoji diskuzní pozici. Zároveň se pokusím poukázat na zakotvení autorovy kritiky v neúplném pochopení některých ekonomicko-antropologických konceptů. Mým hlavním cílem je ukázat, že argumentace J. Macháčka k vyvrácení modelu tržního systému na Velké Moravě nedostačuje.

Velká Morava – tržní systém – obchod – centra – zázemí – potravinová produkce

Introduction

The main aim of the economic, geographic, and political model I introduced (*Hlavica 2023*) was to establish an explanatory framework capable of providing insight into the socio-political complexity of Great Moravia. To this end, I sought to compile and synthesise scattered fragments of current archaeological knowledge concerning the Great Moravian economy in order to construct a coherent picture within which I evaluated a large assemblage comprising more than 600 potters' marks discovered on ceramics from various Great Moravian sites, aiming to maximise their evidentiary potential.

However, previously overlooked structures began to emerge during this process, most notably a system of major Great Moravian hillforts, each situated approximately 60 kilometres apart from one another. I realised that this spatial distribution of centres corresponds to patterns already known in economic geography. In his classic work, W. Christaller identified a similar spatial distribution in his study of southeastern Germany. He concluded that this pattern results from market forces concentrated in central places and the supply

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strategies of these centres in relation to their surrounding hinterlands (for more details, see *Christaller 1966*, 58–80).

When I attempted to apply various normative geographical models to the spatial distribution of central places in the Moravian part of Great Moravia, I found that the system of centres and their market zones, as defined by Christaller's market principle, closely corresponded to the system of major Moravian hillforts as well as to the spatial distribution of morphologically and stylistically related ceramics surrounding them. Identified structure included Břeclav–Pohansko, Staré Město near Uherské Hradiště, Staré Zámky in Brno-Líšeň, Olomouc, and, to a certain extent, Znojmo (*Hlavica 2023*, 46–50, fig. 16, 17). I concluded that I may have identified an archaeological manifestation of a regional market system (*Hlavica – Procházka 2020a*, 79–81, fig. 33). I then sought to test the possibility that the major centres functioned as nodes within such a market system by examining potters' marks and concluded that the examined archaeological evidence did not invalidate but rather supported the proposed model.

Nevertheless, certain aspects of the model remained, and still remain, enigmatic. This includes the incorporation of contemporary centres located beyond the topographical divide of the Small and White Carpathians (in present-day Slovakia), and the role of Mikulčice, a centre presumed to be the primary power centre of Great Moravia and which appeared to occupy a low-tier position in the market hierarchy. The integration of central places along the Danube, both under Great Moravian and Carolingian control, also remained unclear (*Hlavica 2023*, 84–86, fig. 43).

Potters' marks, which formed the primary material basis of my work, were undoubtedly a valuable source of information. A comparative evaluation of the assemblage produced new insights into the distribution of ceramics, primarily at the local level, i.e. within the centres and their hinterlands.

The spatial distribution of pottery marks on a local scale, i.e. within centres and their suburbs and the spatial distribution of morphologically and stylistically related ceramics in the surrounding areas, further supported by ceramic provenance study (*Hlavica et al. 2024*), corresponded to the unrestricted circulation of goods secured by a market network. Particularly in the context of centre–hinterland relationships, it may also indicate the mobility of people, illustrating the market community as an endogamous unit (cf. *Plattner 1989*, 198; *Skinner 1964*) and the trade of goods for which pots served as containers (e.g. salt, which was locally unavailable) or goods which were transported together with pots as part of trade (e.g. as the property of buyers or sellers).

In contrast to the local scale, links at the regional scale, i.e. among major market centres, appeared weak, suggesting a predominance of self-sufficiency of different market zones in the production of everyday ceramics. This was not unexpected. Pottery clay is widely available, and there was therefore little incentive to systematically transport everyday ceramics over long distances between market centres.

This solar system of markets, with only minor overlaps, also reflected the social and political fragmentation of 9th-century Moravia with less interconnected market communities, where market centres corresponded to spheres of political influence (*Minc 2006*, 84). I incorporated this economic and political fragmentation into my model and hypothesised that the economic and political structure of Great Moravia aligns more closely with a decentralised confederative arrangement than with a centralised hierarchy (*Hlavica 2020b*; *2023*, 26–31).

These initial findings undoubtedly require further refinement. Deepening our understanding of the nature of mutual economic interactions among the Moravian centres is crucial. At the beginning of our collaboration, Rudolf Procházka and I (*Hlavica – Procházka 2020b*) highlighted the significance of artefactual assemblages of regionally distributed goods, such as those made of stone and iron. We consider a detailed study of these artefacts essential for advancing our understanding of the economic links among Great Moravian centres. While primarily locally distributed ceramics suggest the existence of a solar system of markets representing more autarkic market communities in Moravia, regionally distributed goods may help to determine whether a parallel network, such as a dendritic one facilitating the distribution of long-distance trade goods among the centres, was also in operation (*Hlavica 2023*, 36–37).

Macháček has taken a contradictory approach to the model presented above. On the one hand, he rejected the notion of Great Moravia having a monetary economy and market system capable of supplying both centres and hinterlands. He views this as incompatible to his interpretation of the Moravian polity, which is based on the application of anthropological concepts such as redistribution (*Macháček 2012*; *2015*; cf. *Earle 2011*). On the other hand, he has integrated certain aspects of the model into his work. One example is *Tom Barfield*'s (*2001*; *2023*) concept of shadow empires (e.g. *Macháček et al. 2021*, 281; *Macháček 2024*, 45), which I incorporated into my theoretical framework to address the apparent contradiction between contemporary written sources that present Great Moravia as a more centralised polity and the archaeological record, which suggests the contrary (*Hlavica 2020a*, 44–45; *2023*, 8–9, 21–23). However, he did not develop the concept in any meaningful way. I believe the notion of shadow empires holds considerable explanatory potential and deserves much deeper consideration in future research.

In response to his latest discussion paper (*Macháček in print*), I aim to demonstrate that much of the recent criticism stems from an incomplete understanding of both my model and the broader anthropological concepts and frameworks on which it is based. To begin, I wish to emphasise that dividing the complex scholarly debate on the relationships between centres and their hinterlands into three conflicting schools of thought is, in my opinion, an undue simplification that diminishes the explanatory potential of the currently available data. I will then respond to the critique of my market-system model, highlighting some shortcomings and simplifications of the original concept.

Three models or three aspects of one diachronic model?

The current discussion about the nature of economic interaction between centres and hinterlands is framed as a zero-sum game by Macháček. He introduces the reader to three schools of thought, which he views as fundamentally conflicting. He also interprets the Great Moravian economy as a static and homogeneous phenomenon. In reality, however, the Great Moravian economy was a dynamic process that could manifest differently across time periods and geographic regions within the archaeological record. As I will illustrate, in order to understand the relationship between centres and their hinterlands, it is essential to develop a diachronic image of urbanisation in early medieval Moravia and to integrate our analytical framework accordingly.

There are essentially two forces behind urbanisation: institutional (top-down) and generative (bottom-up) forces. While top-down forces are maintained by enduring institutions, social structures that persist beyond a single generation and incorporate divisions of labour, bottom-up forces such as self-governance and spontaneous coordination, emerge from people's actions and interactions outside elite control. It would be an oversimplification to attribute the emergence of urban centres and the maintenance of urban order to one of these forces alone. In reality, both are always at play (*Smith 2024*). Even the founding of a centre by ruling elites is rarely, if ever, a purely top-down project on a greenfield site, and archaeological evidence of earlier occupation is common (*Fernández-Götz – Smith 2024*, 239).

This interplay of institutional and generative forces likely characterises the development of major ninth-century Moravian centres as well. These centres were not merely greenfield projects established by Great Moravian princely elites but gradually developed from pre-Great Moravian settlements. Over time, the forces sustaining their urban order naturally evolved.

At Břeclav–Pohansko, considered the apex of the Great Moravian market system, the earliest settlement activity dates back to the sixth century (*Dostál 1985*, 75–79). Other significant Moravian centres with presumed market functions during the Great Moravian period such as Staré Město near Uherské Hradiště, Staré Zámky in Brno-Líšeň, Znojmo, Olomouc, and potentially others appear to have emerged, if not in the sixth century, then in the seventh or eighth century (*Galuška 2014*, 189–191; *Měřínský 2014*, 201; *Kalousek 1955*, 14; *Šlézar 2018*, 120). As I have argued in previous works (*Hlavica – Procházka 2020a*; *Hlavica 2023*, 46–50), their geographic locations reveal a spatial relationship with one another. Together, these sites formed a system that, according to my model, served as the backbone of the Moravian market network in the ninth century.

Due to the decentralised nature of the political landscape prior to the emergence of the Great Moravian polity in the 9th century, this nascent system of centres was unlikely to have been orchestrated through top-down planning by a single elite authority. Rather, these settlements emerged from prevailing generative forces driven by local communities. These communities may have found it advantageous to aggregate in specific locations that maintained spatial relationships with one another. Besides other possible initial motives, such as religious, defensive, or simply social ones, they likely sought to benefit from contact with merchants travelling along the inter-regional trade routes passing through eastern Central Europe at the time (*Curta 2025*; cf. *Theuws et al. 2021*, 455–459), as evidenced by the presence of various imports and specialised craft production at these pre-Great Moravian sites (*Klanica 1974*, 26–27; *Macháček 2010*, 454–455; *Měřínský 2014*, 204; *Šlézar 2018*, 120).

This aggregation of people and the resulting need for more complex organisation, including the control of trade route segments, likely enhanced top-down forces, fostering the institutionalisation of Moravian princely authority (**kъnęnъg*) and the rise of a warrior aristocracy. As suggested by the spatial regularity of later market centres, Moravian princes were aware of each other's domains and segmented their controlled territories into zones with a semi-diameter of approximately 30 km around major centres. This distance, which I labelled *half-day travel* based on C. Spencer's model of territorial expansion (*Spencer 2010*, 7119; cf. *Unger 2024*, 114), also roughly corresponds to a one-day journey for a loaded merchant caravan (cf. *Spufford 2002*, 200–201; see also *Ohler 1989*, 97–101).

As with Scandinavian Bronze Age polities (*Kristiansen 2016*, 178; see also *Ling et al. 2018*, 499, fig. 7), emerging leaders may have sought to interconnect their domains into confederacies. Such alliances would have helped reduce intercommunal conflicts (see also *Gibson 2011*, 224–225) and enabled corporate control over longer stretches of trade routes, thereby increasing the revenues derived from them. In my opinion, this was one of the foundational elements upon which the Great Moravian polity was later constructed. Additionally, some evidence suggests that similar power decentralisation was not a phenomenon limited to Moravian territory but was originally characteristic of early medieval Slavic polities in Central Europe in general (e.g. *Třeštík 2010*, 84–85).

Developing a diachronic model of urbanisation in Moravia – something that is currently lacking – is essential for understanding how Moravian centres secured their food supply. Subsistence strategies likely varied among emerging centres, depending on multiple factors, most notably environmental conditions. These strategies also evolved as top-down institutional forces became stronger, as populations grew, and as social and economic roles became more specialised. In the earlier stages, it is, however, not difficult to imagine that the communities within these centres sustained themselves through a variable mix of agriculture, hunting, and foraging. During the initial centuries of Slavic occupation of Moravian territories, it is important to consider that areas beyond the immediate surroundings of central settlements in the seventh and eighth centuries may still have been covered by dense forests or shrubland, as suggested by written sources such as Ibn Rustah (*Bartoňková et al. 1969*, 345). This would have complicated the creation of a denser network of agricultural settlements farther from the centres.

In my paper on early medieval iron production in Moravian peripheries (*Hlavica in print*), I introduced the Scandinavian concept of *utmark*, an outlying zone where, due to environmental constraints, only seasonal settlements existed and from which resources (including food) were extracted seasonally (*Øye 2005*). This type of resource extraction, particularly in the case of iron production (see *Loftsgarden 2021*), led to deforestation and the transformation of forested areas into arable land. These lands could then be permanently settled, as illustrated by the case of medieval England (*Lewis 2005*). Current knowledge about iron-production landscapes in early medieval Moravia, such as the Moravian Karst, indicates that seasonal exploitation of the peripheries remained active, at least in part, even during the ninth century. In some areas, such as those around present-day Litovel and Uničov, this pattern appears to have continued into the tenth century (see also *Hlubek – Šlézar 2014*, 590, fig. 9).

The concept of seasonal exploitation becomes particularly relevant when considering the model (Macháček's Model No. 2) introduced by P. Dresler (*Dresler 2016*) and later adopted by M. Látková (*Látková 2017*), which presents Great Moravian centres as largely self-sufficient in food production. Although I consider this model somewhat reductionist, as it does not account for the parallel supplying of centres from the hinterland alongside their own production, it does potentially reflect one aspect of the subsistence strategies inherited from earlier phases of centre development that remained relevant into the ninth century. As emerging centres grew, they likely directly exploited agricultural zones in their immediate proximity, what Dresler calls *Umland*. This direct exploitation of the immediate surroundings may have been the most optimal strategy, as illustrated by classical land-use models in economic geography (cf. *Smith 1976*, 7–10, fig. 1). It remained optimal even when these centres began relying more on the wider hinterland for additional food supply.

The idea of centres producing food can be explicitly supported by the presence of agricultural tools from Břeclav–Pohansko, many of which show signs of regular use and repair (*Dresler – Beran 2019*, 294). Without more detailed metallographic analyses, an even more substantial assemblage has been recovered from Mikulčice (*Poláček 2003*). A very detailed evaluation also comes from the contemporary centre of Bojná in present-day Slovakia (*Borzová et al. 2020*). Direct exploitation, as evidenced by these agricultural tools, may have been carried out with the assistance of nearby worksites used either by centre-based communities or by groups closely linked to them. In this light, the presence of archaeologically attested ninth-century features in the close surroundings (*Umland*) of Břeclav–Pohansko does not contradict Dresler's model.

However, as populations grew, food consumption and the demand for other resources inevitably increased, likely surpassing the centre's own production capacity. The need for more efficient exploitation of distant areas most probably again strengthened top-down institutional forces. Institutions and their representatives not only maintained order and resolved internal conflicts within the settlements themselves during this period, they likely gradually extended judicial control over the exploited surrounding areas for the same purpose by applying a customary legal framework governing land use (cf. *Øye 2005*, 12; *Baug 2015*, 124). This extension of institutional authority beyond the centres likely contributed to the territorialisation of early medieval Moravia, as representatives from emerging centres began to assert control over the regions aligned with them (cf. *Iversen 2017*, 250–252).

Thus, more remote areas of the hinterland could be safely exploited, and at least in some instances probably under a seasonal or temporary regime. Environmental changes caused by this exploitation – mainly deforestation – then led to the formation of new permanent settlements in areas where this had previously been impossible. These newly established settlements then supported central places not only with agricultural products but also with goods from hunting, forest farming, and pasture, as well as other production, including, where possible, the smelting of iron and the crafting of stone products. As P. Dresler observes (*Dresler 2016*, 234–235), the depopulation of central places during the decline of Great Moravia may have accelerated this colonisation process, bringing new permanent inhabitants to both the former immediate surroundings and the more remote hinterlands of these declining centres.

The ideas summarised above certainly require serious elaboration, particularly regarding chronology. However, a key conclusion is that neither uniformity in the relationships between centres and their hinterlands, nor their synchrony, singular status, or function for rural settlements, can be assumed. Therefore, I argue that the model of rural settlements supporting central places with their production (Macháček's Model No. 1) does not fundamentally contradict the model of centres producing food for themselves (Macháček's Model No. 2). With appropriate refinement, they can in fact be seen as complementary.

The only missing element is the force that enabled the circulation of goods within this system of centres and rural settlements. In this context, the model of the Great Moravian market system (Macháček's Model No. 3) simply describes the mechanisms that effectively facilitated the distribution of products within the ninth-century Moravian economy. Although Macháček argues otherwise, this model is not in conflict with the other two as he defines them. All three can be integrated into a single, coherent diachronic framework.

Redistribution, market, and money in Great Moravia

An anti-market stance is not uncommon among archaeologists, but it is often more ideological than rational in nature (*Blanton – Feinman 2024*, 2–3). In this vein, Macháček did not provide a detailed explanation of the economic context in which he places redistribution – supposedly the main driver of the 9th-century Moravian economy – nor did he explain why he views it as fundamentally incompatible with the presence of markets (see *Macháček 2012*, 15; *2015*, 473). In this regard, he should clarify his position by presenting a more elaborate model of the economic and political structure of Great Moravia, which could help move the scholarly debate forward.

The inconsistency in his reasoning becomes especially evident in the attempt to marginalise the role of elites in Great Moravian centres, as suggested in the final paragraph of his discussion article. Redistribution, which Macháček previously emphasised, is intrinsically linked to elite political economies. It serves as a mechanism for fulfilling the political agendas of elites, not as a strategy antagonistic to market exchange. It does not contradict the existence of markets, as he contends, because it does not significantly interfere with the circulation of everyday goods. Rather, redistribution typically involves mobilising such goods for institutional financing, alongside the mobilisation or production of prestigious items intended for building and sustaining elite power networks and hierarchies (*Earle 2011*, 239; *Schortman – Urban 2004*, 190–192).

This raises a fundamental question: how could a redistributive system operate without elites or with only marginal top-down forces? What would be its objective? The Moravian archaeological record clearly reveals redistributive artefacts such as highly decorated jewellery (*Ungerman 2020*; *Krupičková 2024*) and elite warrior equipment, pointing to the prominent role of a warrior aristocracy (*Košta – Hošek 2014*, 306–307; *Kouřil 2020*). In addition, elite residences are well documented, with 'palatial' structures (*Galuška 2011*, 106–108) and so-called 'magnate courts' (*Dostál 1975*; *Macháček 2010*, 478–484) attested in major centres.

Conversely, how were basic iron agricultural tools and low-cost stone artefacts such as quern-stones, whetstones, spindle whorls, and pottery distributed across the region through mere redistribution? While household self-sufficiency may partially explain this, it cannot account for the widespread distribution of certain artefacts such as quern-stones, which travelled over considerable distances, likely through multiple centres (e.g. *Prišťáková 2016*, 118, 121; *Hlavica et al. 2023*, 62–63).

In contrast to Macháček, I have presented an explicit model that explains distribution mechanisms through market forces and situates them within the broader political and economic framework of a regional market system. Macháček rejected the model of the Great Moravian market system, viewing it as incompatible with his own model of redistribution. However, he fails to acknowledge that market activity is not inherently in conflict with redistribution, nor is it incompatible with the collective-action theory he recently employs in support of his position (see *Blanton – Feinman 2024*, 6).

One of Macháček's current objections is that archaeological data are equifinal, i.e. that different processes can lead to similar outcomes in the archaeological record (*Renfrew 1977*, 83). He uses this argument to dismiss attempts to connect archaeological evidence with economic models. However, in the very text from which he draws the concept (*Hlavica – Procházka 2020b*, 75), Rudolf Procházka and I, drawing on anthropological theory, argued

that everyday goods, especially pottery, largely avoid the problem of equifinality. These low-cost, widely available items are subject to continuous resupply due to breakage and typically lie on the margins of elite economic interest (*Hlavica 2023*, 53, *Klír – Štefan 2025*, 125). Pottery, therefore, is not only a legitimate but an ideal archaeological material for studying exchange mechanisms, particularly those related to market dynamics, as there is no substantive evidence to suggest that its distribution was ever monopolised by elite institutions (*Stark – Garraty 2010*, 44, 49–50; *Garraty 2009*, 158).

The spatial distribution of morphologically and stylistically distinct ceramics around major Moravian centres clearly identify these sites as hubs within production-distribution networks, connecting them economically to their hinterlands. Macháček's analysis of pottery from one such hub – Břeclav-Pohansko – reveals an increase over time in ceramics produced by specialised potters at the expense of non-professional production. He originally interpreted this as a gradual shift from non-professional production toward greater reliance on the market, for which more professionally made ceramics were intended (*Macháček 2001*, 219–221, 256). Later, he abandoned this view in favour of a redistributive model. However, he has not provided a coherent alternative explanation for the aforementioned increase in professionally made ceramics that would align with his new argumentative position. What does this trend mean in the context of redistribution? How and why did such ceramics reach the broader hinterland?

Macháček further argues that the network between centres and rural settlements, as evidenced by identical potters' marks, was weak. He refers only to two identical marks – both associated with Břeclav–Pohansko – and claims that no identical marks are linked to Mikulčice. This, however, is incomplete. My assemblage, unfortunately, did not include evaluated material from rural settlements, but only from two rural cemeteries (Nechvalín – 5 marks, Prušánky – 23 marks) and one hamlet near Mikulčice's fortified area (Trapíkov – 2 marks). Nonetheless, identical marks between Mikulčice and Nechvalín have been explicitly presented (*Hlavica 2023*, 68, fig. 29). Additionally, an identical set of marks is found at the rural site of Pellendorf in modern Austria, as well as at Mikulčice and Pohansko (*Hlavica 2023*, 81–82, fig. 42; see also *Kühtreiber 2019*). Finally, more identical marks were identified and explicitly presented from Trapíkov and Mikulčice (*Hlavica 2023*, 80, fig. 40; see also *Hladík et al. 2022*; cf. *Lebsak – Hlavica in print*). Given that marked vessels are generally rare and most pottery circulated unmarked (see also *Varadzin 2005*, 170–174, tab. 1–2), these findings are not negligible.

Two of the marked vessels found in Mikulčice, which bear marks identical to those from Trapíkov, were of non-standardised forms, indicating production by less specialised potters possibly outside the centre of Mikulčice. This shows that ceramic flow in the system could be bidirectional: from centres to the hinterlands, but also the other way around. In my work, I hypothesised that craft specialists in centres could have been supplied by producers from the hinterland. This idea was based on the variability of pottery marks in production areas such as Břeclav–Pohansko – Forest Nursery and Staré Město – U Víta, which suggests a non-centralised, market-based production and distribution system in which craft specialists actively participated (*Hlavica 2023*, 72–80, fig. 38, 39). This hypothesis has since been further supported by archaeometric studies. Pottery from waste pits in the production area of Staré Město – U Víta originated from different parts of the centre's hinterland where settlement activity has been documented (*Hlavica et al. 2024*, 1007–1010, 1012–1013, fig. 12).

A lack of a solid argumentative basis is also evident in Macháček's rejection of the monetary role of axe-shaped bars. He asserts that such bars cannot be archaeologically proven to have functioned as currency. His position is, however, rooted in the work of P. Urbańczyk (*2008*, 156–157), who misinterpreted J. Piaskowski's analysis of Slovak axe-shaped bars. Piaskowski acknowledged that these bars could serve as raw material (*Piaskowski 1964*, 137), but he never claimed that their primary function was to serve as transportable semi-finished products. Urbańczyk's view was later adopted by I. Štefan (*Štefan 2011*, 343) and subsequently by Macháček (*Macháček 2012*, 15). However, Štefan has since revised his stance (*Štefan 2014*, 158) and most scholars now accept axe-shaped bars as currency tokens (see *Curta 2025*).

It is clear that iron, as a raw material, originated from multiple regions of early medieval Moravia. However, the primary semi-product transported from smelting sites was not bars but iron blooms. These blooms have been found in Great Moravian centres (*Merta 2019*; *Merta et al. 2022*), but they were rarely produced there, as analyses of iron slag confirm (*Hlavica et al. 2022*, n. 3 on p. 332; *Lebsak – Kapusta 2024*, 67, tab. 3). Additionally, in an archaeological experiment conducted by the historical smith Patrick Bárta and myself using a wrought-iron bloom experimentally smelted by O. Merta and his team, we concluded that processing such blooms into axe-shaped bars, and even more so further forging these bars into finished tools, results in enormous iron loss during the forging process (*Hlavica et al. 2020*, 25; *Hlavica – Bárta 2021*, 17). This demonstrates that axe-shaped bars were most likely intended as finished products, with their use as raw material reserved only for emergencies (see *Hlavica et al. 2022*, 346). Intentionally forging a semi-product into such a shape not only lacks economic rationality but also complicates subsequent re-forging into a finished tool, making it both technically and materially demanding.

Based on these experimental results and several cross-cultural analogies, I attempted to define an evolutionary sequence of axe-shaped bars. I proposed their origin in ritual practices, in which real axes served as grave goods or ritual offerings. This is not particularly surprising, as axes were the main tools for the transformation of the woodlands with which the Slavs were probably surrounded at the onset of the Early Middle Ages (cf. *Hlavica in print*). In these grave goods, pieces of inferior quality or unfinished tools were likely often included, as can be demonstrated by an exemplar dated to the late 8th century found in Devín, Slovakia (*Hlavica et al. 2022*, n. 1 on p. 329).

In Moravia, I presume that through gradual simplification these objects evolved into forms from which a functional axe could no longer be made. This process of simplification is supported by several analogies (*Hlavica – Bárta 2021*, 18). Among the most interesting are finds from the 4th and 5th centuries in what are now the republics of Tatarstan and Udmurtia, where transitional types of axes and axe-shaped bars can be identified, sometimes with the remains of axe hafts still present (*Szmoniewski 2022*, 8).

The earliest stylised axe-shaped bars were apparently large items, with a weight comparable to that of real axes (*Hlavica et al. 2022*, fig. 1). These large, impractical pieces of iron probably already functioned as social currency, i.e. were used primarily in non-market exchange intended to transform social relationships (see *Graeber 2012*, 412). It is uncertain whether they were already used in parallel in market exchange at the time of their appearance, or if such market activity had yet to emerge. However, through an evaluation of the assemblage from Staré Zámky in Brno-Líšeň, I attempted to demonstrate that small

and miniature axe-shaped bars, which probably appeared later, were likely integrated into such exchange within Great Moravian centres, as they circulated within them without any apparent constraints (*Hlavica et al. 2022*, 331–347, fig. 11).

In his further search for inconsistencies in my argumentation, Macháček also attributes to me the claim that the economies of centres were controlled by elites, which he believes would make it impossible for craft specialists to sell their surplus. This is, however, a misinterpretation. In my original work, I stated that Great Moravian elites were in a position to create price monopolies (i.e. to apply bottlenecks) on the flow of imported commodities, which entered the market through a dendritic network with an apical market node controlled by Mojmirid elites (*Hlavica 2023*, 35). Among these goods was likely salt, which is explicitly mentioned in the Annals of Fulda (*Reuter 2012*, 124) and the Raffelstetten customs regulation (*Třeštík 1973*, 874). Besides an uncertain volume from Bulgaria, salt arrived in large quantities aboard ships from the Frankish realm, travelling along the Danube and possibly partially transported by land (see *Třeštík 2010*, 187). It then had to be distributed to the wider population in both the centre and the hinterland, as it was crucial for food production and long-term food preservation. I can hardly imagine a system of centralised redistribution of this commodity to the entire population of Moravia. How would such a system operate? From a purely economic perspective, it would be extremely costly and time-consuming (*Stark – Garraty 2010*, 44). This is why I hypothesised that elite (princely) patrons of markets hosted market events in their residence centres and benefited directly from market exchange, selling locally unavailable goods that they had obtained from long-distance traders. I therefore regard the Great Moravian princely kins as the first 'entrepreneurs', securing the inflow of goods from long-distance trade and offering them to the population. This granted the Moravian elites a monopolistic position within the market, enabling them to manipulate prices, accumulate wealth, and invest in prestige as a means of competing with other elites in comparable positions.

There are, in fact, indications that not only princely elites but also lower-ranking local leaders benefited from trade. The rural site of Brankovice, recently analysed by J. Benech, is situated almost exactly between the major market centres of Staré Město near Uherské Hradiště and Staré Zámky in Brno–Líšeň, and contains ceramic pieces characteristic of the market zones of both centres (*Benech 2024*, 228, fig. 68). Additionally, archaeometric analysis of ceramics and comparison with fabrics previously identified in pottery from Staré Město near Uherské Hradiště show that some of Brankovice's pieces attributable to Staré Město's fabrics A and D probably originated from sites in the southern or southeastern hinterland of Staré Město near Uherské Hradiště (*Benech 2024*, 64; cf. *Hlavica et al. 2024*, fig. 12). Also noteworthy are indicators of possible local production of professional ceramics in the Morava River ceramic style (Brankovice's fabric A1) and evidence of other crafts, such as iron production (*Benech 2024*, 64, 125–144). This evidence, along with the evidence of imported ceramics, suggests that Brankovice may have functioned as a lower-tier marketplace, strategically situated between the major Moravian centres. Its location, accessible by a merchant caravan within one day from either centre, further supports this interpretation. In this context, more research is indeed necessary, not only on Brankovice, but also on other areas in geographically advantageous positions among major central places, such as those around Bořitov (see *Mikulec et al. 2022*, fig. 1) and Dolní Věstonice (*Hlavica – Procházka 2020b*, 78; see also *Poulík 1948–1950*, 84–87; *Macháček 2001*, 247).

Finally, I also find Macháček's attempt to support his anti-market position by comparing the distribution system of Přemyslid Bohemia in the 10th to 12th century, as defined by L. Varadzin (*Varadzin 2010*, 56), with the situation in 9th-century Moravia to be flawed. Systems of overlapping and non-overlapping distribution zones are not indicative of whether market or non-market forces were responsible for the distribution of goods. Aside from the fact that such zones also overlapped to some extent in 9th-century Moravia – as illustrated, for instance, by the aforementioned Brankovice – both systems in fact reflect different types of market systems as defined by economic anthropology (*Minc 2006*, 83–87, Fig. 1; see also *Hodges 2012*, 23–25, fig. 3; *Hlavica 2023*, 42–44, fig. 15).

While solar market systems (with non-overlapping market zones) indicate poorly developed hierarchies and networks among trade centres that combine political and economic functions – where political control coincides with economic influence – non-centralised market systems (with overlapping market zones) reflect a greater degree of horizontal networking not confined by administrative boundaries (*Minc 2006*, 84–86). This suggests a more advanced economic and political integration of the region in which regional elites act as less independent economic agents. Thus, the differences between the market systems in Přemyslid Bohemia and Mojmirid Moravia are more reflective of differing degrees of political and economic integration than of market or non-market forces underlying ceramic distribution. If Macháček wishes to reject the market-system model, he must seek alternative evidence to substantiate his position.

Concluding remarks

In the discussion section of his recent paper, Macháček argues that the presence of a market economy in Great Moravia was highly unlikely, as it was an uncommercialised economy lacking both a market for internal trade, a class of independent merchants or a currency that would have served as a universal medium of exchange. He further claims that craft specialists worked primarily for elites who benefited from long-distance trade, and that any surplus available was invested in enhancing the power and prestige of Moravian princes, who redistributed these 'goods' selectively based on their political goals.

I find a portrayal of such a system in which all producers would be controlled by elites and all production was channelled solely to enhance elite wealth and prestige highly questionable. This vision of total control of all aspects of economic life finds no support in the archaeological record of early medieval Moravia. Conversely, it relies on outdated social models inherited from the era of New Archaeology, popular in the 1960s and 1970s, which imagined that '*rulers and elites controlled, or strived to control, all aspects of life and society…*' (*Smith 2024*). The final attempt of Macháček to reinforce his redistribution model with collectivist theory as promoted by *Graeber* and *Wengrow* (*2021*) bears no meaningful connection to the preceding argumentation and lacks any substantial justification.

At this point, I must reject Macháček's criticisms. I fully acknowledge that my economic and political model of Great Moravia centred on the 9th-century Moravian market system is far from flawless (see *Šenk 2023*; *Unger 2024*; *Kalhous 2025*). Nevertheless, I continue to see it as a productive starting point for assembling the scattered fragments of Great Moravia and for subsequently exploring the lived experiences of our early medieval predecessors in greater depth.

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