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Development (the 1300s-1450s). An  
Institutional Approach to the Globalization  
Of the Late Middle Ages**

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# **The Amazing Synchronicity of the Global Development (the 1300s-1450s). An Institutional Approach to the Globalization of the Late Middle Ages.**

*Lucy Badalian, and Victor Krivorotov*

## **Abstract.**

In a new approach to a long-ranging debate on the causes of the Late Medieval Debasement, we offer an institutional case-study of Russia and the Levant. Avoiding the complexity of the “upstream” financial/minting centres of Western Europe, we consider the effects of debasement “downstream”, in resource-exporting periphery countries. The paper shows the amazing synchronicity of the worldwide appearance of the early modern trading system, associated with capitalism or commercial society. The centre-periphery feedback loop amplified trends and pushed towards economic and institutional changes. This is illustrated via the Hanseatic-Novgorodian and Italian-Levantine trade – under growing market pressure of the exploding transaction costs, the oligopolies gradually dissolved and were replaced by the British-Dutch traders. In this case-study the late-medieval/early-modern monetary integration served as the transitional institutional base for reducing transaction costs during a dramatic global shift. Highlighting centre-periphery links, a new trading outpost of Arkhangelsk rose synchronously with Amsterdam.

## **Introduction.**

The hotly debated question of the causes for the Late-Medieval/Early-Modern debasement produced two distinct hypotheses with variations in between. The first stresses the greed of princes, profiteering from their seigniorial rights to mint. Through this simple devise they gained twice, both from debasing and taxing their mint's output. Meanwhile, the second hypothesis highlights the need to monetize a growing array of trading goods with limited supplies of silver, essentially inelastic until the 1540s<sup>1</sup>. This need was fuelled and made

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<sup>1</sup> “...innovations in both mechanical and chemical engineering that produced the South German silver-copper mining boom, which quintupled Europe's silver supplies from the 1460s to the 1540s, when even cheaper supplies of silver were arriving from the Spanish Americas.” (Munro 2006)

urgent by fairs of the 13<sup>th</sup> century, Hanseatic bulk trade of the 14<sup>th</sup> century and the globalization of the 15<sup>th</sup>-17<sup>th</sup> centuries (Findlay, O'Rourke 2007). While both explanations seem perfectly legitimate and supporting examples exist both ways, the second factor appears strengthening after the 1440s. A growing body of research provides support for a growth in the monetary integration of the prominent financial centres in Germany and Italy (Volckart 1996).

Technically, however, the separation of the two hypotheses cited above presents significant difficulties, as long as the research remains confined to the vantage point of commercializing and industrializing Europe. It is hard to procure the right datasets from its past, with proper controls for the many variables in the complex and fast changing situation of the Late Middle Ages. This increases the ambiguity and decreases the traceability of possible causal effects. Apparently, this calls for a new approach which would considerably widen the datasets from a new vantage point.

In this sense, an addition of a complementary case-study of resource-exporting countries of the-then periphery, Russia and, to an extent, the Levant, seems to be offering significant benefits. First and foremost, it appears to be free of the cited technical constraints of distinguishing between the princely greed and the market-based need to increase monetization. For example, the Novgorodian Republic minted its official coin only in the 1420-1456. Also, the Novgorodian traders accepted the debased Prussian Mark, at least, up to the 1420s, when it basically lost its value. These two facts, taken together, seem to be hinting at their need to monetize their goods.

The available data shows that not only was the Novgorodian Republic trying to monetize its then most prized good, the northern

squirrel pelts<sup>2</sup>, but it also went to a great trouble in order to develop a highly sophisticated, wide-reaching and cost-efficient infrastructure to collect and deliver them. Then, during a deflationary downturn, the collapse of this highly specialist trade spelled trouble for the Republic. At the end, it was absorbed into the Muscovy after wars with Lithuania/Poland over ownership. The significant war indemnity payments sent its dwindling treasury funds first to Lithuania then to the Muscovy<sup>3</sup>.

However, using Russia as a case-study necessitates introduction of a different sort of controls –for geographical exclusivity. In order to assure that the Novgorodian-Hanseatic trade was representative of the period and not a quirk, we take a brief look far south, at the Levantine trade with the Italian cities, first and foremost, Venice. It turns out that, after a period of falling gold weights of the dinar, in the 1420s sultan Barsbay of Cairo struck a new gold coin (ashrafi or new dinar) equal to the ducat, underscoring the ongoing integration of Egyptian-Venetian trade<sup>4</sup>. Preceding this, but nearly synchronously, the florin was also made equal to the ducat and the Florentines asked to make it legal tender in Sultan's dominions. (Ashtor 1983: 277). Thus, just like Novgorod, the Levant

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<sup>2</sup> Other items in the Novgorodian trade, such as wax, at about half of squirrel pelt value, moved in price synchronously.

<sup>3</sup> In 1428 Novgorod paid Vitovt 10000 roubles. In the 1440s, a war broke between Novgorod and the Livonian Order (immediately following the Teutonic Order's 1410 loss at the battle of Grunwald). The Hanse abandoned Peterhof for 6 years (1443-8). Muscovy's Vassily II – 1441 (8000 roubles) 1456 Vassily Temny (Blind) received a huge (unspecified) indemnity and acknowledgement of his suzerainty. In a series of wars from 1470 Novgorod attempted to join Casimir IV of Lithuania and Poland, and, after being defeated by the Muscovy, paid war indemnity of 15500 roubles. Several revolts ensued after annexation, in 1479-88, and were punished by removal of the richest families to Moscow, Vyatka etc. The enormity of this sum of 35000-40000 roubles can be gauged by comparing it against fur prices, which, at 3 dengas per pelt would add up to 2-3 million pelts. Consider also that the entire sum of Mongolian taxes is estimated at annually about 5000 roubles, progressing to 15000 roubles at Dmitry Donskoy time of the 1350s, when his growing difficulties of paying the assessments are considered by some as contributing to the decline of the Golden Horde, with the Great Troubles from 1359, disintegration in the 1420s and the fall from the 1480s.

<sup>4</sup> Note that the earlier dinar, weighing about 4.25 grams of gold was modelled after the Byzantine solidus, thus reflecting an earlier occurrence of market integration, always a good means to reduce transaction costs.

hardly could maintain its monetary independence and may thus be considered relatively controlled from the fiscal side. Also, in the manner of Russia, the Levant served as an export-driven periphery to the Venetian financial centre – sitting amidst the ailing domestic economy, the sultan of Cairo grew increasingly dependent on the highly specialized spice trade, which he tried to control as a royal monopoly until his efforts failed due to deflation.

So, despite the great distance between these geographic localities, both Russian and Levantine trades were based on niche specialization – cantered at northern squirrel fur versus spices. Both of these localities served as export-driven periphery to the European financial centres, the Hanse and Venice, respectively. The patterns of their trade evolved synchronously, demonstrating a strong feedback loop-type relationship between the periphery niche traders and the network of the European financial centres of that time.

## **I. A Case-Study of Exporters from the Periphery – Russia and the Levant.**

### **I.1 Deciphering the Late Middle Ages/Early Modern Era Market Shift Through Processes on the Periphery.**

As argued above, addition of new datasets culled from the periphery countries provides a different vantage point complementing the extant datasets, which trace the coin debasement in Germany and Italy. The central dilemma between the princely greed and market-driven monetization may now be reformulated as follows: what were the direct effects “downstream” in the resource-producing periphery caused by monetary actions taking place “upstream” in the financial centres of that time. Using our case study, we show that the European silver debasement from the 1300s and up to the 1440s had direct and well

traceable effects on the Novgorodian squirrel fur trade. First, it dramatically expanded to compensate for the losses through scale and better price differentiation through the introduction of finer grades. Then, it collapsed under the weight of a creeping deflation<sup>5</sup>. Similar effects were noticeable also in the Levant. In the 1410s the sultan used his monopoly to raise spice prices. Afterwards, in the 1440s, high prices could not be supported anymore in the overall deflationary climate and collapsed<sup>6</sup>.

Thereafter, in Russia, the introduction of the Joachimsthaler from the 1510s<sup>7</sup> offered a more stable base for the next attempt of monetary integration. Among other things, the relative monetary stability lowered transaction costs for the Russian foreign trade of the Late Middle Ages. The 1535 monetary reform of Elena Glinskaya<sup>8</sup>, the mother and the regent for Ivan the Terrible, was built on the strength of the Joachimsthaler (well known in Russia as the efimok) and helped in integrating the Russian and the European monetary space<sup>9</sup>. In the 1580s, after the

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<sup>5</sup> Squirrel fur fashion starts at the end of the 13<sup>th</sup> century with fine scarlet woollen cloaks. Among known lovers of northern squirrel fur: Henry III (1216-1272). Edward I (1272 to 1307) Edward III (1327-1377) Henry IV (1399–1413), his daughter, Philippa of England wore squirrel during her 1406 marriage to Eric of Pomerania, King of Denmark, Norway and Sweden.

<sup>6</sup> Price of pepper rose greatly from 1410, remained high in the 1420s, reached a new peak in 1423-5 120-130 dinars, then fell from 1428 until the 1440s, with higher prices in the 1430 due to manipulations of the sultan, who sold the 70ashrafi good to Europeans for 100 ashrafi. The prices went down in the mid 15<sup>th</sup> century. (Ashtor 290).

<sup>7</sup> Due to the introduction of better mining and refining technologies, including the advanced amalgamation of the saigerprocess etc (Blanchard 2001)

<sup>8</sup> Such monetary reforms, taking advantage of the better availability of bullion, were hardly confined to Muscovy, which underscores the widespread need for monetary stability. If, in a locality, there was a better availability of silver, then silver was used, as in the Muscovy, if gold then gold, as it happened, for example, in Poland, which had good access to the Hungarian gold. In 1526, the Zloty system was introduced. The "Red Zloty" or "Polish Ducat" was minted of 3.5 grams of gold, with the silver zloty at 23.1 gram. Then, in 1569, to bridge the gulf between the separate gold and silver coinages, a silver "talar" was also introduced. This was equivalent to one red zloty, or to eight "silver zlotys"... On this scale, one dollar or ducat was worth 240 groszy or 4 320 pence. (Davies 1981: 130)

<sup>9</sup> The Russian monetary system after the reform of Elena Glinskaya was based on the small silver coin, presumably aiming at the promotion of local trade. The main coin was the novgorodka of 0,68 g. Afterwards, there were also moscovkas, at half the value or 0,34 g and polushkas, halved again at 0,17 g. The full system was fixed in the Trade

Novgorodian fur trade failed, there was a pronounced shift to a new trading pattern with English and Dutch merchants, with the centre in Arkhangelsk and a new basket of vital goods for the bulk trade – cordage, tar, tallow, train-oil along with true luxury fur, such as sable etc. Simultaneously, the luxury fur was also sent to the south, to the Black Sea port of Caffa, held by the Ottomans.

In this context, the use of extant Russian/Levantine data seems promising for tracing both failures and successes of the monetary integration at different stages of the increasingly global trade from the 14<sup>th</sup> to the 17<sup>th</sup> centuries. The case-study highlights the rise of a new and more efficient early modern trade system based on freer markets and bulk trade as the *raison d'être* of the rise of the early modern nation-state, able to protect extensive trade routes. It came as a replacement for the earlier market segmentation practiced by such externally linked oligopolistic bodies as the Hanseatic League/the Novgorodian Republic or Venice/Levant. Their mutual dependency could hardly be hidden under their nearly casual hostility.

At the very start of the process, during the growth of the High Middle Ages, the attempts to resolve worsening shortages of supplies opened up a larger trading zone. From the 14<sup>th</sup> century, the rising Hanseatic League (trading in salt-fish, wax, amber, furs, grain etc) appeared as an adequate early attempt to alleviate these shortages. The Baltic trade was essentially monopolized in order to reduce transaction costs through a precise balancing act of supply-demand networks.

Just as predicted by Coase (1937) hierarchies thus gained an edge at specific points, helping to save, through long-term contracts and delegation to authority, a portion of costs associated with market

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Book of the 1570s: 1 rouble=2 poltinas=10 grivnas=100 novgorodkas=200 dengas or moscovkas=400 polushkas.

operation, since the latter is more than zero. Williamson (1985) found asset specificity as a major factor sustaining hierarchies. Both asset specificity and long-term contracts were central for medieval oligopolies. They efficiently joined buyers and sellers together in an intricate mutually dependent network, fully dedicated to locating, mustering and then delivering all the available supplies in the most cost advantageous way possible, in order to satisfy the thirsty market. However, they paid for these efficiencies by increasing their internal rigidity. As supplies improved with the entry of new producers, the economic conditions gradually evolved to shortages of demand in the Late Middle Ages following the Black Death as shown in Figure 1 below. The oligopolistic bodies built to deal with supply shortages were ill equipped to handle this new task.

The strain of demand shortages evolved slowly and gradually until it brought the Hanseatic-Novgorodian trade system to the near collapse after the mid fifteenth century. The Hanseatic League closed its Novgorodian kontor in 1495. When it reopened in 1514 the main issue of contention was the Muscovite insistence that “the Germans pay for Russian goods with silver rather than salt. Lübeck’s ambassador in 1510 responded that the Hanseatic merchants could not possibly afford to pay for the “hemp and tallow and other goods” they bought exclusively with silver. Significantly, fur was not among the items at the top of his shopping list”. (Martin, 1986: 84). This dispute underscores the shift of the composition of the trading basket to the new list of preferred goods of the bulk trade era. Also, the gradual fading of the Novgorodian trade highlights the difficulties of specialized monopoly traders unable to adjust to the new and shifting reality and thus losing market share to new trading centres. Synchronous developments took place also in the Levant. For a while, the spice prices held, due to the frantic efforts of sultan Barsbay to maintain trade monopoly, as he charged the Venetian traders 100

ashrafis for a good with a local price of 70 ashrafis (Ashtor 1983: 292). However, this could not hold for too long. Ashtor testifies that abundance of spices led to declines in their prices amidst the deflationary trend of the near eastern economies, which contributed to decline in demand for these relatively costly articles. (Ashtor 1983: 290)

Obviously, a freer market would have presented a viable and more flexible alternative to the monopolistic approach of the Novgorodian-Hanseatic or Venetian/Levantine trade, but only if it were possible to adequately increase the monetization of goods. If successful, this would have been based on an even better reduction of transaction costs as compared to the Hanse or Venice. The increased flexibility, gained by the use of various free-market tools including market integration, should then provide sufficient benefits to compensate for market costs as an institution mentioned by Coase (1937). The preliminary data seem to support the gradual spread of a freer market. Russia eventually established a new type of bulk trade in cheaper goods, with a centre in Arkhangel'sk, which started trading with Amsterdam and London from the 1580s.

Note that, both economically and politically, this presented a shift to the early modern era and nation-states, instead of the earlier trading cities in Italy and the Hanse based on monopolies. In this sense, the 1420-40s presented an important junction in this slow and gradual development, which was synchronously felt over wider expanses. During the deflation of the 1420s, Cairo, its own industries faltering, took in inexpensive European textiles brought-in by the Venetians at the later stages of its waning spice trade (Ashtor 1983: 326)<sup>10</sup>. The Russian squirrel fur trade

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<sup>10</sup> "The decline of prices of various commodities was a striking feature of the economic life, so that the European merchants, among whom the Venetians were most prominent, had to lower the prices of the European cloth they marketed in the Near East and to offer cheap articles. Almost all the data concerning the prices of European cloth sold in Egypt and Syria in that period point to a slow decline. The German cloth

virtually disappeared at this very time, victim to the redirection of scarce funds to luxury furs and vital goods of the bulk trade era – sable, cordage, train-oil, tallow, potash etc. Thereafter, the rise of Amsterdam produced direct reverberations felt globally. Instead of Novgorod, the earlier trade-post with the Livonian Order, there was now Arkhangelsk (the 1580s) providing cheap access to the goods from the Urals and Siberia to the English and Dutch merchants coming from London and Amsterdam. Of course, this new trade was supported by the appearance of a much more stable monetary system, based in Amsterdam and then London.

## I.2 Russia, a Case-Study for the Late Medieval/Early Modern Boundary.

As it is usually the case with historical datasets, the availability and the integrity of information presents a major problem. This may be alleviated, to a degree, by juxtaposing several sources, in order to control for their unavoidable incompleteness and ambiguity.

For Russia, among those most promising:

- numismatic data on the fineness of the excavated coins in the excellent collections of the Hermitage in St. Petersburg and the State Historical Museum in Moscow;
- cadastres of 1496 and 1563 for select fur-grain producing areas, such as the Obonezhskaya Piatina;
- tax data levied by the Muscovy in the 1550s, as it, following several revolts, overtook the earlier Novgorodian estates – this set of data highlights a dramatic shift from fur to grain and cash collection<sup>11</sup>;

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that the Venetians offered in the Moslem Levant was generally very cheap, and this certainly was also true of the Polish cloth. Another phenomenon was the spread of the use of English cloth". (Ashtor 1983, 326).

<sup>11</sup> The payment books for taxes were compiled in 1555-6 for Kargopol', Turchesov, and the Dvina land (1552-3 and there also was a revision in 1559 (Martin 152).

- account books of particular Hanseatic merchants (Olrik Elers, Fekinguzen, Vahendorn etc) and records of select trading ships. This data was extensively published, especially in Russian (see the list as an attachment to bibliography);
- for select years, there are relative fur prices in Novgorod and Reval or Dorpat, in the Prussian Mark, the Mark of Lubeck and of Riga, and the Novgorodian rouble. The latter served as a unit of value measured through its content of silver<sup>12</sup>.

In its turn, these data sets can be somewhat controlled for incompleteness by introducing additional lines of complementing information, including, but not limited to:

- assessments of silver paid in taxes to the Mongol overlords in the 1320s (Ivan Kalita, ruling 1325-40) and the 1350s-80s (Dmitry Donskoy)<sup>13</sup>

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<sup>12</sup> According to Martin, prices in Novgorod gradually rose, which may in part or whole reflect the ongoing debasement. This can be used to compare the relative speed of debasement and price appreciation to gauge for price stickiness vs money neutrality. Schoenewerke, anigen, lushwerke are different, specifically Novgorodian grades of northern squirrel fur, listed from the finest down.

	<u>1399</u>	<u>1402-3</u>	<u>1403-4</u>
1000 schoenewerke	9.35 NR	9.5 NR	9.7 NR
1000 anigen	8.4 NR	8.6 NR	8.7 NR
1000 lushwerke	7.5 NR	7.6 NR	7.7 NR

<sup>13</sup> According to Kuchkin, in the 14<sup>th</sup> century, the Mongolian tax to Moscow principedom amounted to 1000 roubles. At the end of the 14<sup>th</sup> century, the former Dmitrov, Galician, Vladimir principedoms, now united under the Moscow prince, paid about 5 000 roubles. He assesses the entire sum of Mongol taxes from Russian principalities as equal to 15 000 roubles. If correct, this is an enormous sum. 1 rouble in Pskov, where land was relatively poor, could buy 750- 3900 kg of grain (47-243 pud depending on the annual harvest). The rouble of the 15<sup>th</sup> century is lower than rouble of the 14<sup>th</sup> century. According to Kuchkin's estimate, in 1384 Dmitry Donskoy's taxes amounted to about 2 tons of grain from each Russian village, at that time, comprising only about 1 to 3 household. (Kuchkin 1991: 22). This was the high point of the Golden Horde. "By the end of the century, especially after Timur's attack and the destruction of the east-west trade route through Sarai in the 1390s, Sarai's capacity to attract northern fur correspondingly declined." (Martin 100). This was only for the good. "Muscovite merchants, building upon contracts made under the shadow of Sarai, developed direct trade with the Italian merchants of the Crimean colonies." (Martin 100). In this way, a

- significant loss of profitability of former fur-producing estates as they were being switched to grain, to a lesser degree, cash, and also bequeathed to monasteries;
- war indemnities paid by Novgorod to Muscovy, which are listed in the footnote 1.

An especially intriguing set of data was preserved through the names of various tax components. As it happens, the Muscovy administration continued to levy cash taxes using the older Novgorodian names, such as the *bel* and the *gornostal*, as a substitute for the earlier taxes charged in squirrel and ermine correspondingly. However, it also levied new taxes, whose titles stress both the new administrative structure of more recent areas under its control and provide the ratios for the related expenses. Among them: defence-related taxes (*pischalnye* – *harquebusier*), postal taxes (*yamskie*), chancery expenses (*kaznacheevskie* – *treasury*), bookkeeping taxes (*dyachie i podyachie* – *dyak* and *podyachii* denote administrative titles) etc<sup>14</sup>. Studying their relative ratios along with their geographic and chronological spread as compared to the older fur-based *bel* and *gornostal* offers a unique opportunity for tracing the radiation of the early modern state of the

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more efficient oligopolistic system, built by Italian cities, superseded the less efficient one of the Mongols.

<sup>14</sup> Old taxes (*stary dokhod*) 1470s, immediately before the takeover by the Muscovy in 1478. New records (*novoe pis'mo*) 1496. The taxes recorded in 1552-3 – *bel* and *gornostal*. (*kopanev*) were the carryovers from the Novgorodian times. After new, muscovite taxes were added, they together accounted for 65% of all taxes. In the mid 16<sup>th</sup> century, *belka* and *gornostal* were counted in cash – 3 *dengas* for *bel* and 7 *dengas* for *gornostal* (Martin, p. 75). Muscovy taxes had a clear bureaucratic bent – postal (*yamskie*), arquebus (*pischalnye*), treasury (*kaznacheevskie*), administrative (*diachie i podyachie*), per plough (*pososhnye*). In the seven taxable units per village (*pogosts*), for which data on the rent paid to the Novgorodian boyars are known, it was on average 6 squirrels per person, 11 per household, 9.5 per taxable unit per family (*obzha*) (Martin 77). After the reopening of the German kontor in 1514, the bulk of trade through Reval to Europe was in hemp, flax, tallow, cable-yarn, train oil, wax, honey and hides (Attman 107, Martin 84). Payments in the 1530s to Olrik Elers were recorded in salt, tin, cloth and silver.

Muscovy as it gradually replaced the older Novgorodian system of the Hanseatic trade.

While the thorough collection, evaluation and cross verification of possible datasets is still in the future, there is already a rich assortment of preliminary publications and credible econometric assessments hinting at their potential promise. A selection of those is provided at the end of our bibliography.

Meanwhile, the size of northern squirrel fur-based market can hardly be overestimated. For example, Janet Martin calculates that Novgorod rent+tax mechanism supplied a minimum of 200,000 squirrel pelts per year in the third quarter of the 15<sup>th</sup> century, when the market had already markedly declined. Testifying to the gradual loss of the fur trade profitability and importance, a substantial number of boyars disposed of their estates during the 15<sup>th</sup> century, often transferring them to monasteries, which didn't participate in the fur trade system (Martin 1986: 157). This can be compared to the earlier data on the trade. For example, in 1393 one ship of captain Dubbelson was carrying over 225,000 pelts. (Martin 1986: 159). Martin estimates that, overall, the peak supplies could be easily two or three times more than that. At the height of the fashion, England alone consumed hundreds of thousands of northern squirrel pelts annually – perhaps, this data can also be located through British sources, while German sources need to be consulted on monetary flows and the level of debasement of specific coins.

The datasets for the Levant may be preserved even better as shown by Eliyahu Ashtor (1976, 1983), our main source on the Levant for this paper.

### I.3 The Synchronicity of Russian-Levantine Developments.

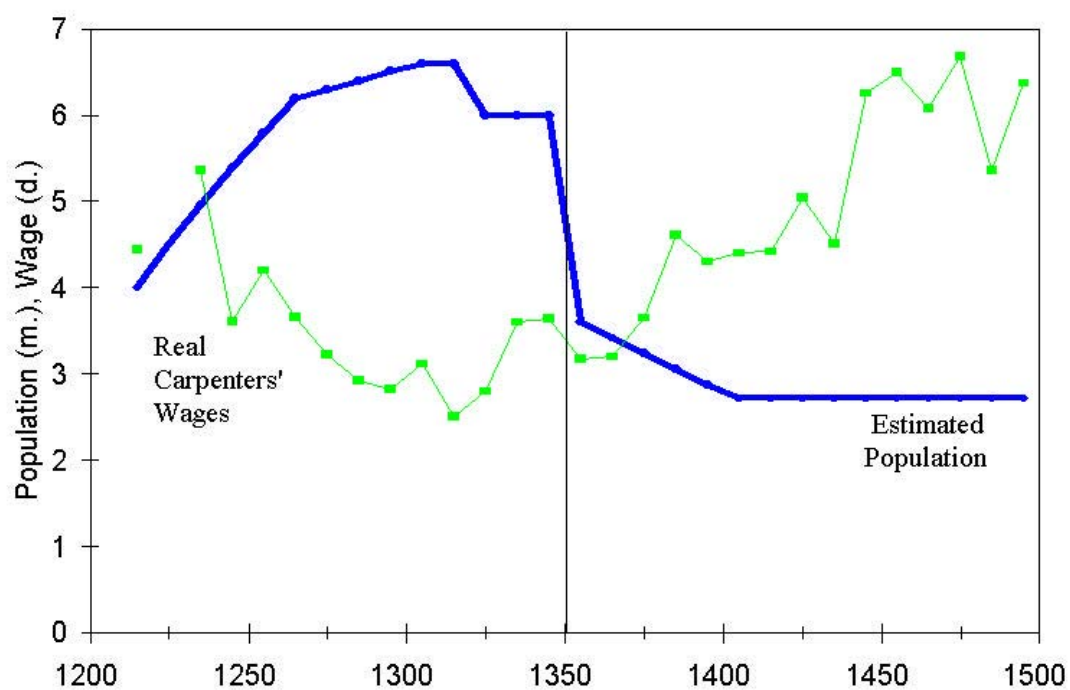
We use these preliminary data for studying the notable increase in market-flows at the dawn of the early modern era. Swift changes distinct

for that period were felt strongly in Russia, a periphery country. Due to its dependency on inflows of silver<sup>15</sup>, which then came from Europe, it was extremely sensitive to supply-demand shifts. The suitability of the Russian data for a case study on market integration comes from the fact that, in a nearly monocultural economy based on fur exports, Russian developments amplified global trends and made them even more pronounced and easier to see. Not infrequently, a sneeze at the monetary centre produced pneumonia for the resource-exporting periphery.

Our chief hypothesis is that, among other things, events and processes taking place in Russia reflected a dramatic switch, originating in the Western Europe and spreading out to its faraway neighbours. During the 14<sup>th</sup> century, Europe was in a tumultuous equilibrium, while it was experiencing a shift from shortages of supplies to shortages of demand. The supply shortages (especially on food and fuel) were acutely evident during the famine of the 14<sup>th</sup> century, but, assumedly, accumulated from as early as the 13<sup>th</sup> century as a side effect of the late medieval demographic and economic growth (Fischer 1996: 4). A switch to demand shortages can be related to a huge drop in population in the 14<sup>th</sup> century. Synchronously, the growth in monetization of the globalizing trade (Findlay O'Rourke 2007) amidst a drop in the European silver production (Blanchard 2001) caused desperate thirst for silver in order to invigorate trade, perhaps, a factor in geographic explorations. Silver shortages in the Hanse culminated in the 1420s-40s and were accompanied by widespread debasements (Volckart 2006).

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<sup>15</sup> Thomas Noonan points out that dirhams appeared in the Eastern Baltic before the Rus', who, as may be surmised, were attracted by the kufic silver. (Noonan??)



**Figure 1. Population and Wages, 1210-1500**

**Source:** Clark (1998).

**Note:** Carpenters wages are in pence per day, normalized to the prices of 1300-49 using an index of agricultural prices.

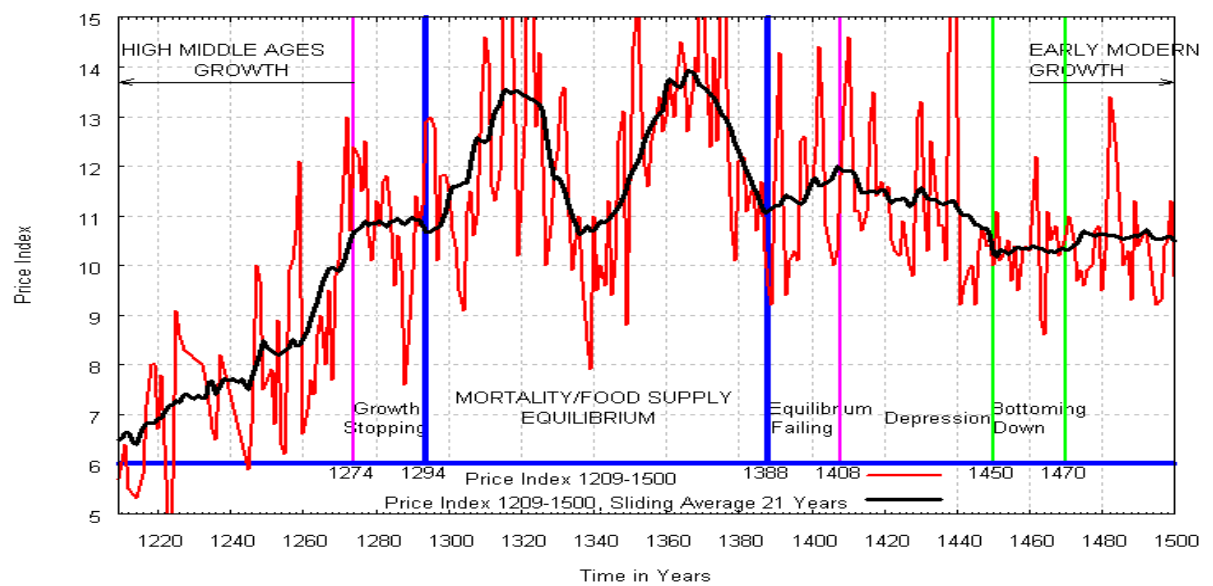


Figure 2. Price Index, England and Wales 1200-1500. 21 years Sliding Averages.

**Data source:** (Clark 2003)

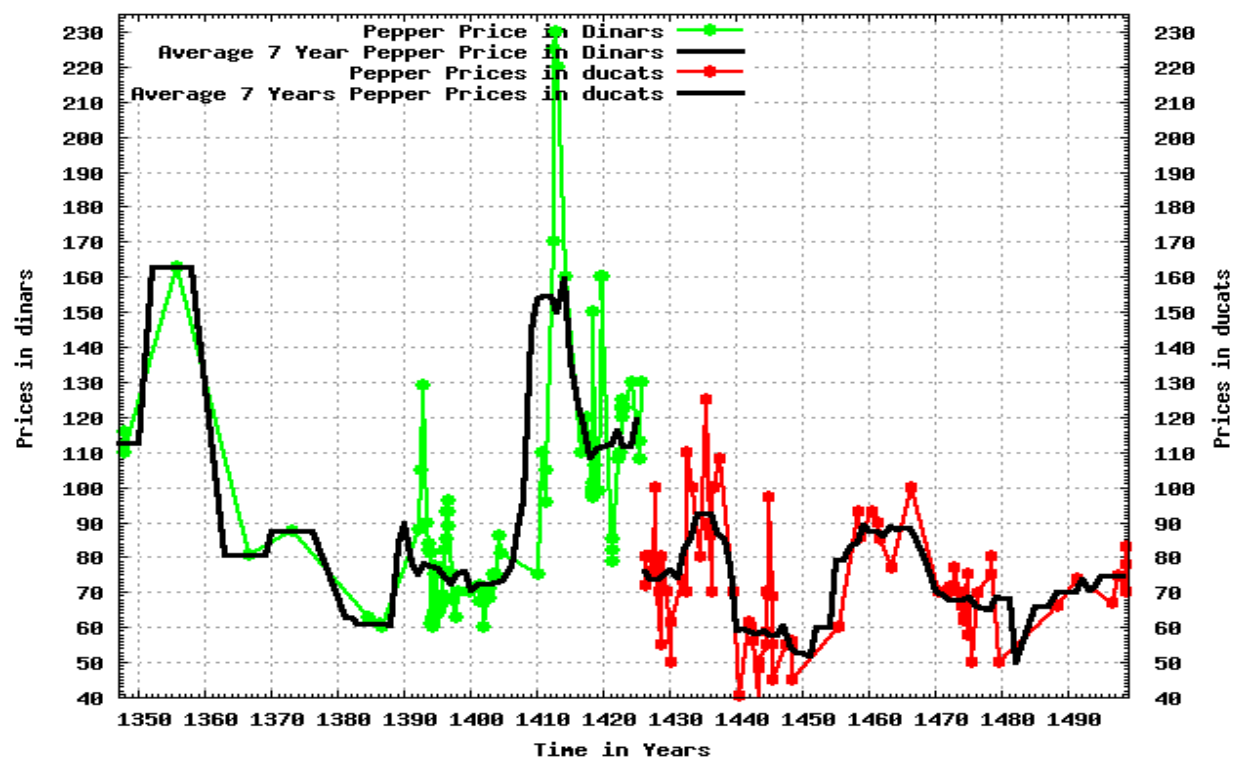


Figure 3. Pepper prices in Alexandria, 1350-1498. Sliding Averages. 7 years.

**Source of data:** Ashtor 1983: 167-9, 313-5.

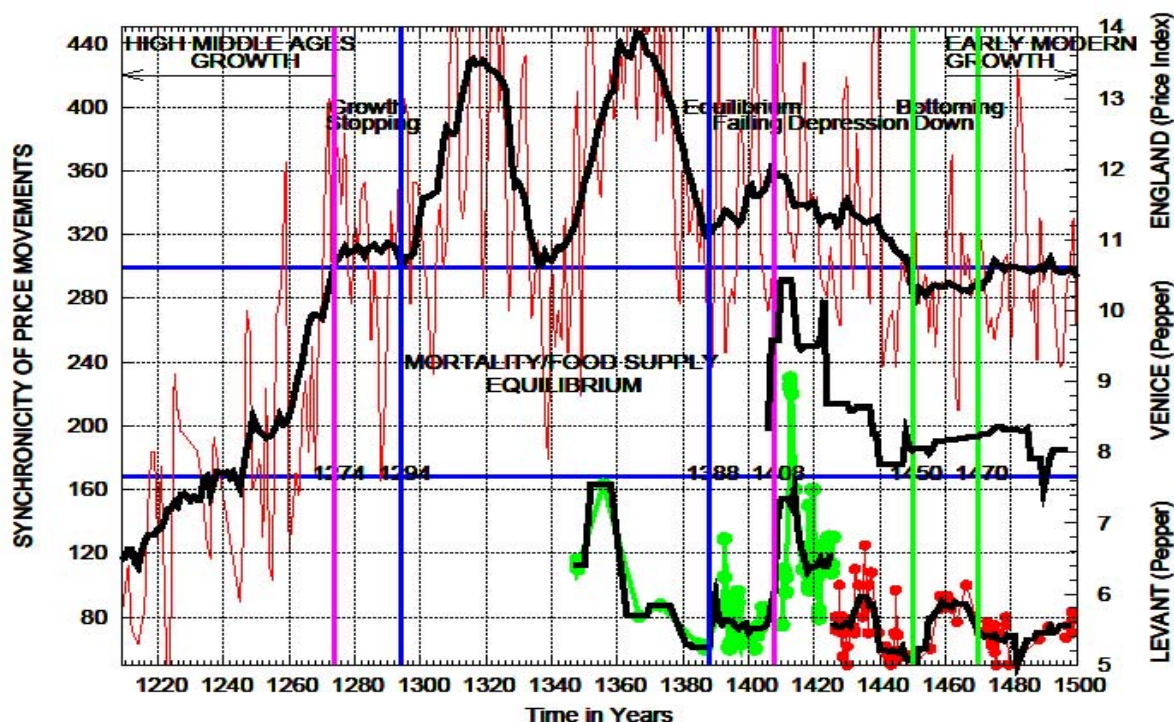


Figure 4. Price Index, England and Wales 1200-1500. Sliding Averages. 21 years.

**Data source:** Clark 2003.and Ashtor 1976, 1983

In the Levant there was a synchronous development, as shown in Figure 4 above. “The upswing of the Levant trade of Venice was probably to a great extent the effect of the abundance of spices at relatively low prices on the Levantine market, a factor which facilitated their marketing in Europe.”<sup>16</sup> (Ashtor 1983: 312). At that moment, “the Moslem Levant was suffering from an economic depression; its economy was characterized by deflation and the impoverishment of broad sections of the population. The decline of prices of various commodities was a striking feature of the economic life, so that the European merchants, among whom the Venetians were most prominent, had to lower the prices

<sup>16</sup> “Speaking of the year 1430, the chronicler Morosini says: “I would like to remark that for many years so much spice and other commodities had not come to Venice.” (cited from Ashtor 1983: 312).

of the European cloth they marketed in the Near East and to offer cheap articles. Almost all the data concerning the prices of European cloth sold in Egypt and Syria in that period point to a slow decline. The German cloth that the Venetians offered in the Moslem Levant was generally very cheap, and this was certainly also true of the Polish cloth. Another phenomenon of the Levant trade in that period was the spread of the use of English cloth” imported on a large scale in the second quarter of the 15<sup>th</sup> century. (Ashtor 1983: 326). Note that the prices for the northern squirrel fur were also falling, as long as we consider the level of debasement. First, this produced a growth in trade volumes, aiming to compensate for losses, then a sharp drop.

In a giant feedback loop, the deflation and depression of export-driven countries of the periphery also curtailed the buying power of the European merchants. They gradually abandoned their earlier preferred basket of goods swapping it for a new basket of bulk-trade related and much more affordable goods.

In the case of Russia the trend towards the market integration with the rapidly developing West can be seen through the fast disappearance of the lucrative, though extremely narrow-based, northern squirrel trade through Reval and Dorpat, which was central for Novgorod. It was replaced by a new fast growing trade in such items as cordage, tallow, train-oil etc, which were shipped-out from Arkhangelsk by the Dutch-British merchants, providing around 60% of state revenues. Meanwhile, the relationships between Russian and Hanseatic merchants turned increasingly acrimonious, as the latter refused cash payments and forced acceptance of barter, while the former confiscated their goods as a retribution for the poor quality of their debased silver (Martin 1986: 82)<sup>17</sup>. Meanwhile, in a parallel development, the Italian galley-cog trade of the 15<sup>th</sup> century would soon be superseded by the dominance of the rising

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<sup>17</sup> Dollinger 1970: 77, 294-5, Kazakova 1949, Khoroshkevich 1980 etc.

nation-state. First there came the European caravels, with the Portuguese controlling the base in Goa from 1510, travelling directly to Malacca in 1511 and to the Moluccas in 1512-4, and capturing Hormuz in 1515. Expansion and the apogee of the Ottoman Empire (1453–1566) similarly applied the force of a rising nation-state from the opposite direction of the East. Synchronously, in the second half of the 15<sup>th</sup> century, Novgorod's fur trade network disintegrated and its role crumbled. "Novgorod never fully recovered its position as the major fur centre of the Russian lands." (Martin 1986: 84)

## II. Debasement and Its Effects – Preliminary Results and Interpretation.

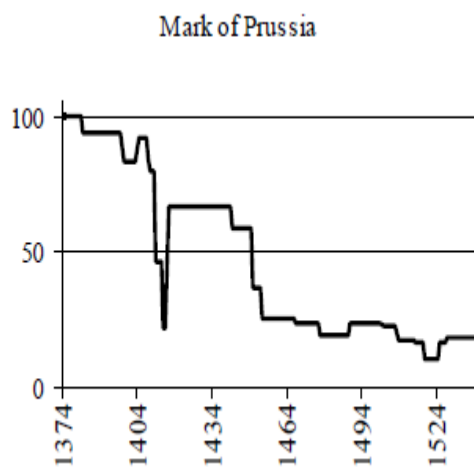
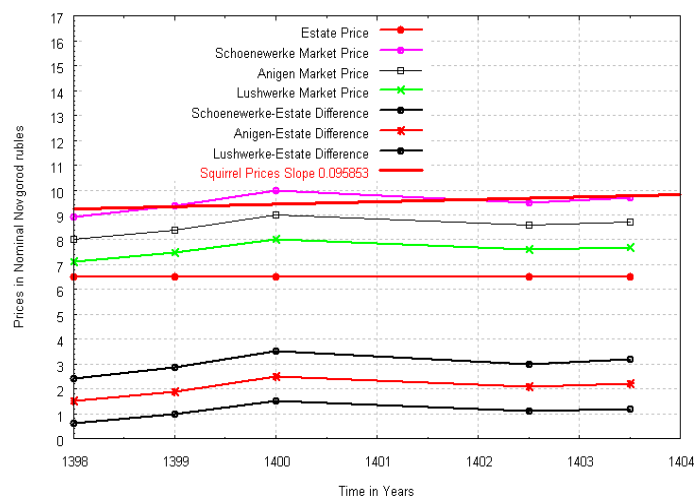


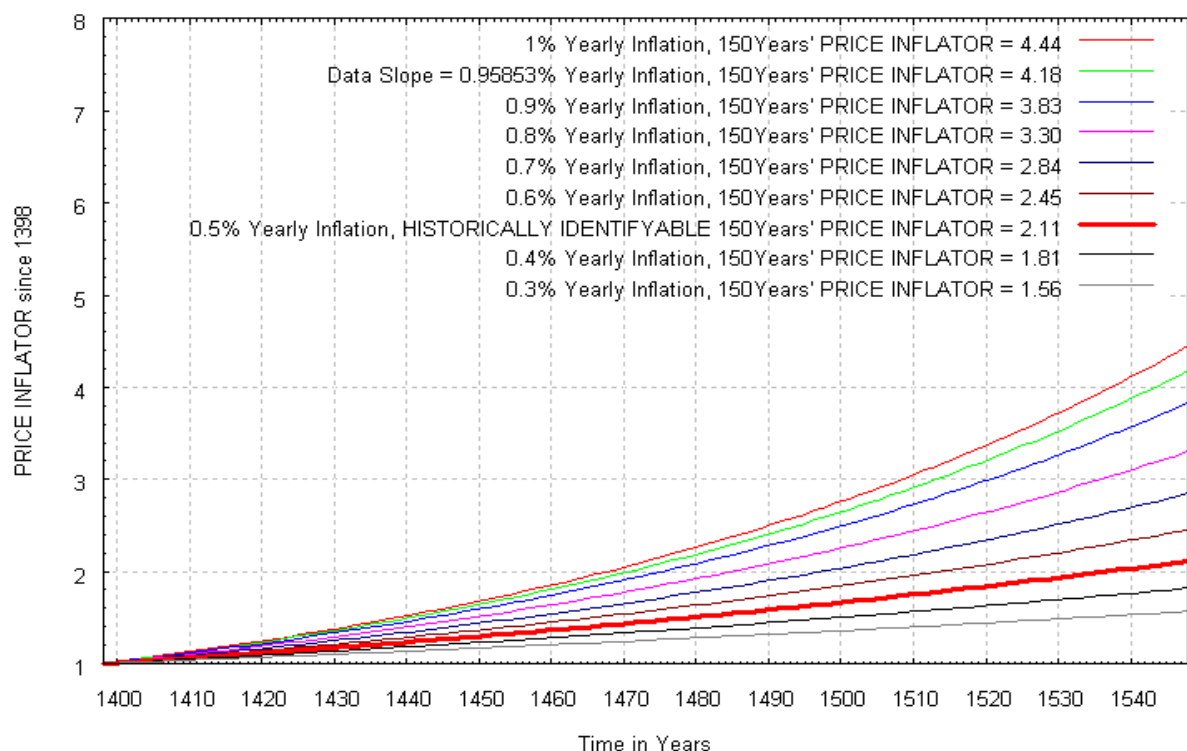
Figure 5a. Debasement of the Prussian Mark

**Source:** Volckart O. 2008



**Figure 5b. Price Appreciation for Northern squirrel 1398-1404.**

**Source of data:** Martin J. 1986.



**Figure 5c. Price Appreciation for Northern squirrel (a Response to the Debasement of the Prussian Mark and Other Sources of German Silver?).**

Source: price estimates for the 1400s (1.4 dengas per pelt) provided in (Martin J. 1986) from various sources and the cash equivalent per pelt (3 dengas) as levied by the Muscovy tax assessments in the 1540s (Martin). Fitting these data (appreciation of 2.2 for the period of about 150 years) produced the best approximation at about 0.5 per cent annual inflation rate. Of course, this is much lower than the rate of debasement of

the Prussian Mark of pic 5a. The latter was among the chief means of payment to the Novgorodian suppliers after the attempts to curtail the outflows of silver from the Hanse after 1379 (Khoroshkevich 1962: 302-307, 1961: 106 (She cites article 63 of a 14<sup>th</sup> century Hanseatic statute: "The penalty for providing silver to the Russians is one mark." Despite these restrictions, she estimates the then inflows of German silver as significant.). The value of most Hanseatic silver coins fell spectacularly, from the fineness of about 96 to less than 16, about six-fold, until their use in coin form in Novgorod was banned in the 1420s. At the same time, the Venetian ducat held steady, at the same fineness and weight for nearly 500 years.

The significant difference between the appreciation of squirrel (about 2.2 times in 150 years) and the fall in the value of the debased Prussian Mark (about six-fold in 150 years) shows that the prices were indeed quite sticky. The exporters absorbed the debased coin and the related losses of about threefold as long as they could. Of course, this was a heavy weight on their economy. Afterwards, the economic ruin coincided with a political disaster, where the Novgorodian suppliers, who lost their independence to the Muscovy in 1478, were joined by their worthwhile buyers from the Teutonic Order, absorbed into the Polish-Lithuanian kingdom in 1525.

Note that the dinar-denominated price closely correlates with the price movements in England as shown on Figure 4. Ashtor notes that "the price of pepper, which had risen greatly from 1410, remained high in the 1420s. In 1423-1425 it even reached a new peak, viz. 120-130 dinars. Then from 1428 it went down and was 70-100 ashrafis the sporta until the 1440s. The high price of pepper in the 1430s, however, was caused by the transactions of the sultan. When the commercial price was 70 ashrafis, he compelled the Moslems and the Europeans to buy it for 100. In the fifth decade of the century, the price was very low, 50-60 ashrafis or even less... The prices of several other spices and aromata moved in the same direction: they went down in the middle of the fifteenth century." (Ashtor 1983: 312, 316).

To better appreciate the processes we need to take a look at the global scene. It turns out that the growth up to the 1300s stopped,

creating conditions for equilibrium, where mortality balanced a precarious equilibrium with wages and prices. Conditions of food supply/population equilibrium are supported by Postan Titow (1959) – post mid 13<sup>th</sup> century mortality and grain prices were shown as closely correlated. Below we cite Findlay, O'Rourke (2003: 15), where this hypothesis was thoroughly tested:

“The economic and monetary consequences of the Black Death are worked out by means of a general equilibrium model with endogenous population, capital and commodity money supply in Findlay and Lundahl (2000) Real wages rise; population slowly recovers, driving real wages slowly down again; and an initial inflationary spike is followed by a long phase of deflation. The model postulates a demand for Eastern luxuries that rises with the higher per capita wealth and income, leading to an increased outflow of precious metals to the East and hence a prolonged monetary contraction.

Then, they explain the major changes during this period:

... Furthermore, this period of increased incomes and a higher demand for Asian luxury goods coincided with the demise of the Pax Mongolica and its associated overland trade, and a consequent reliance (once more) on traditional Indian Ocean trade routes and monopolistic Egyptian and Venetian intermediaries. Presumably, this increased the incentive to find a sea route to Asia. The result of all these changed incentives could well be a more modern society in 1450 than in 1350. One that was ready to venture more readily and further abroad and to usher in a true era of globalization with the Voyages of discovery linking all the continents by sea”.

This is supported by Miskimin (1975: 116).

“By the beginning of the thirteenth century, trade had become more a way of life than uncertain adventure, and regular

institutions and trade routes had been devised by medieval merchants for their convenience and profit”.

Thus, the data testifies that, at least for select categories of goods, the condition of shortages of supplies, felt acutely at the start of the 14<sup>th</sup> century, was already reversed, at least partly due to the growth of long distance trade, to the no less dire condition of shortages of demand around the mid fifteenth century. The graphs show, clearly and unequivocally, that the resource suppliers, despite their resistance, which, occasionally, took extreme forms of mutual violence, imprisonment etc, had acquiesced to the market reality. They accepted the conditions of the unrelenting debasement and absorbed its costs as the price of continuing their business. Since, in the cases of Novgorod and the Levant, the trade was highly specialized (fur against spices), their choice of buyers turned to be fairly limited. This is especially stark for the case of the Levant, where the sultan kept his ties with the Venetians through tightening the monopoly, while basically refusing to deal with the Catalans and other willing buyers, since they insisted on free markets outside of his control.

An attempt to explain the underlying market forces brings us to the two main concepts of this study: “shortage of supply” and its opposite, “shortage of demand”. These were initially developed in the context of the 19<sup>th</sup> and the 20<sup>th</sup> centuries, where the spread of the related phenomena also displayed surprisingly regular patterns (Badalian, Krivorotov 2009). Below, we use these concepts for interpretation of our preliminary results, trying to decipher processes revealed by the data.

In a nutshell: The large oligopolistic bodies on the scale of the Hanse and Italian city-states rose and were wildly successful under lush conditions of shortages of supplies of the High Middle Ages and shortly thereafter. However, their own success contributed to their future demise and they faded, when, starting from the 15<sup>th</sup> century, the opposite

conditions of shortages of demand led to a price drop favouring the freer markets of the early nation-states.

If we use terms of game theory, shortage of supplies presents a positive sum game, favouring cooperation – market segmentation under oligopolies. Equilibrium would amount to zero-sum game, the time of transition from positive sum game to negative sum game of shortages of demand, which favours cutthroat competition and freer markets.

Perhaps, the contrast between shortages of supplies vs shortages of demand can be best illustrated through Eric Jones' famous claim that economic history is "a tug of war between growth propensity and rent-seeking." He continues that "these propensities have switched economies between *extensive* growth and *intensive* growth." (Jones 1988: 47).

During the Late Middle Ages the medieval institutions of the rising bulk trade, such as the Hanseatic League, produced, at their start, a sharp rise in income levels. Among other things, the fur trade greatly increased the profitability of forested hinterlands of the Moscow principedom, which hardly could produce any adequate amounts of grain. Meanwhile, at the high point of 1384, Dmitry Donskoy's taxes paid to the Golden Horde amounted to about 2 tons of grain from each Russian village, which, at that time, had only about 1 to 3 households. (Kuchkin 1991: 22). Perhaps, his inability to continue at this extremely high level contributed to the well documented problems of the Golden Horde, which entered the period of "great troubles" in 1359 and started to disintegrate from the 1420s.

As highlighted by the debasement of the Prussian Mark in Figure 5a, this was also a difficult period for the Novgorodian-Hanseatic relations, which served as the chief conduit for Russian silver intake at that time. As the trade gradually faded, there was also a sharp drop in the level of the Novgorodian taxes between the end of the 15<sup>th</sup> century, when the taxes still went to the Novgorodian Republic, and 1555, when Novgorod was already under the Muscovy rule. At the end, the economy

was sharply demonetized, with the Muscovy government promoting grain-farming, previously a fringe occupation in this northern climate. The preliminary assessment registers the size of this drop as approaching 25% (Martin 1986).

The earlier monoculture-export-driven power, the Novgorodian Republic, started fading after experiencing a period of fast growth. While its development was quite intensive at the peak, its trading activities were gradually shifted to rent-seeking. For a while, territorial expansion served as the main means for supplying the surging volume of pelts for exports, until the market shifted and would take them no more. As its trade faded, Novgorod entered a series of wars, paying huge indemnities as listed in the footnote 1 until it was overrun by Muscovy in 1478. Novgorod, which kept its independence through the Mongol invasion and up, but then lost it along with its gushing source of revenues, was hardly alone. It was followed in its demise by its trading counterpart, the Teutonic Order, which was absorbed into the Polish-Lithuanian kingdom in 1525 as the Duchy of Prussia. The Levant, which clung to its spice trade, which evolved following the same scenario of first expansion in the volume in order to compensate for the falling prices and then a sharp drop, also fell to the Ottoman Empire in 1517.

The switch from shortages of supplies to shortages of demand between the High and Late Middle Ages could have been started under the influence of the famine and the Black Death. However, it also produced a number of other consequences. Among other things, it appears that it drastically shifted the vector of transaction costs<sup>18</sup> from oligopoly to freer competition, providing the latter with a winning edge after the fierce resistance of the earlier trade partners crumbled.

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<sup>18</sup> We understand vector of transaction costs as reflecting the entirety of all costs related to transactions. Below we'll show that these are indeed different for rent-seeking oligopolies as compared to growth seeking competitive entities.

Simultaneously, a switch to the intensified price competition promoted innovative industries, such as European textile making, especially at the lower end of the price range. Taken together, these developments provided their contribution to the rise of the modern nation-state, able to provide valuable public goods (Jones), including such as maintenance and defence of extensive trade routes, both on the land and the sea. At this point of development, transaction costs were reduced due to the complete exclusion of various oligopolistic middlemen. Their mark-ups were previously tolerated, up to a point, due to a valuable service they provided by connecting the consecutive interlocking segments of the larger market.

1. **Shortages of demand** – chronologically, these became evident from the fifteenth century (Figure 1). In order to better appreciate the processes hinted at by our data, we must consider this situation as an economic phenomenon, played out in the macro-micro context. In this sense, the Late Middle Ages hardly differ from the modernity, since, in both cases, despite the stark variation, inefficiencies must be resolved in the same way, by reducing transaction costs.

The condition of shortages of demand is basically nothing more or less than a creeping deflation, which might in fact evolve quite slowly. Traditionally, and up to our days, it is much dreaded as a precursor for a lengthy depression. In the negative-sum-game, a deflationary market tends to gradually wipe out the less efficient producers. The main challenge during a severe deflationary downturn is to create a better, more efficient market, with much lower transaction costs. The new line-up may include new types of companies and up to the rise of new and altogether different market institutions and industries. The main reason

why deflation stimulates such dramatic changes is the pressing need to survive within an unfolding deflationary spiral, forcing market participants to reduce transaction costs by lowering prices in any way possible, from purely technological to organizational and institutional. Any middlemen are ruthlessly eradicated as soon as this becomes possible, whether due to innovation (caravel vs galley/cog), organization (royal charter vs interlocking oligopolies, such as Hanse-Novgorod or Venice/Cairo), or a new configuration of trade routes (early modern nation-state vs late medieval cities with their restricted reach).

Under the conditions of the globalizing market, transport, logistics, organization of deliveries, currency interchangeability, barriers of trade, information costs etc grow into a major part of the overall transaction costs. At this moment, the pattern of competition shifts. Now it unfolds not between individual producers or their guild-like unions, but rather countries and their respective institutions. In this way, globalization created a huge pressure on the extant institutions, forcing them to compete, while in segmented markets they could exist side to side relatively peacefully and cooperatively, regardless of their efficiency or the lack of thereof.

For example, the Hanseatic League and the synchronous development of the Italian towns (Venice, Genoa etc) pursued monopolistic trade and divided their respective markets. Although divisive and at times combative, their cumulative role was immense, since, taken together, as interlocking entities, they greatly improved the overall market integration. For example, the ducat became the de-facto gold standard of the time, with other states minting comparable coin.

However, this was only the initial stage. After creating a larger playing field, they could now be outcompeted by charter companies, more up to the growing scale of expanding bulk trade. In Coase's terms, due to its flexibility, market becomes more profitable than hierarchies. Among

examples, “The English Muscovy Company [with its royal charter granted in 1555] was the single most important customer for Russian tar, which it used in the manufacture of cordage, its main export from Russia... The Dutch operated two similar enterprises, one at Kholmogory by the early 1620s at the latest, and another at Arkhangel'sk in the early 1640s” (Arel 2004: 177). Even though they were indeed state monopolies, they were first to create an open competitive market as a replacement to the earlier monopolistic unions, such as the Hanseatic League. (Arel 2004: 175-203).

The search for cost savings also ignited technological change, when old and well known designs were used in a brand new context, within new applications. Among examples is the caravel, a juxtaposition of several well known principles. Each of these came from a different predecessor ship: from the European carvel construction to the Arab lateen sail. As it evolved to the galleon and other large tonnage ships, their much longer range of travel led to great reductions in transport costs, an important part of global transaction costs. The drive to reduce overall transaction costs applied to information as well. Its costs were lowered more or less simultaneously and quite dramatically with the help of bookprinting. Naval charts, descriptions of currents etc, previously often the subject of commercial secret, were made both affordable and widely available. Meanwhile, the first printed book was the Bible, while the first recorded profits of Gutenberg came from printing the indulgencies, which highlights the circuitous nature of the path between the old and the new.

Summarizing, efforts to reduce transaction costs at the time of globalization of the Late Middle Ages were developing in three major directions:

- Integration of the monetary market.

- Creation of new institutions – charter companies appeared as a replacement for merchant unions, up to the rise of the nation-state, which granted and protected the royal charter.
- New transport infrastructure, including all the needed technology, from shipbuilding to bookprinting. We need to note that the early modern bulk trade, which first evolved on the Baltic and Northern Sea trade routes and spread further, up to the transatlantic trade, completely changed the global geometry. The initial portion of this infrastructure was completed by the Hanseatic League around the 1500s.

Meanwhile, this drastic reduction of transaction costs turned out much less innocent than it might have seemed at the first glance and initiated a cascade of changes. Charter companies needed state protection of their trading routes. This, in its turn, meant navies, standing armies, taxes, budgets and other institutions of a modern state<sup>19</sup>. At the end of the day, the trading space has been greatly expanded and such nation-states that were better able to support the related market institutions, especially such expensive ones as the standing army, gained a competitive edge over their weaker neighbours, including the Eastern Europe and the Levant.

2. **Shortages of supply** – chronologically, these preceded shortages of demand and evolved from the end of the 12<sup>th</sup> century, becoming evident in the 13<sup>th</sup> century (Figures 1-2).

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<sup>19</sup> It is a well known fact that a regular standing army didn't exist before the rise of the early modern state. For example, the Roman legion was first and foremost the centrepiece of the Roman economy, where its soldiers built the majority of modern European capitals as legion campsites.

In its pronounced forms, shortage of supplies implies a seller's market. The supply of goods is inelastic and the price is established by the last item, which satisfies the urgent market needs. This leads to creeping inflation as the market is concentrated on assuring the procurement of the needed supplies at the price still acceptable for the market. Under these conditions, the market isn't geared at picking the absolute winner. Instead, anyone with more or less suitable offers can be easily accommodated.

However, the situation slowly and gradually deteriorates, as the resulting creeping inflation eats into profit margins. Up to a degree, the pressure of such an evolving inflationary spiral may be still mitigated, through the evolution of economies of scale. Participation in such a market implies the existence of a suitable market share, which must be guarded and protected at any cost. Thus, a seller doesn't deal with a single item, but a flow of items, with transactions costs calculated for the entire flow. Obviously, the larger the flow, the lower per item costs – a sizable part of these costs would be thus devoted to getting and protecting one's market share.

Among expenses: sorting, quality maintenance, fraud protection etc. For example, in the case of the squirrel fur trade of the Hanseatic League with Novgorod, the Hanseatic buyers had to sort the furs according to the grade, which usually meant a discount ("naddacha") for possible inferior furs, presumably hidden in the middle of the pack. Then, with the quality assured, they had to repack the furs into barrels etc, for the move to the end customer etc. They had to guard against trespassers, who might dump their goods etc as it indeed happened with the Novgorodian sellers, who brought excellent goods at a low price directly to the market and found no takers.

As shown in the new trade theory, today, significant transaction costs related to building and maintaining a company's market share force

towards development of economies of scale. In historical practice, to maintain and protect one's market share various devices could and were in fact used, from the protection of one's supply routes through such means as disinformation and up to militaristic actions, improvement of the desirability of the traded items to the end customer through brand-name creation and up to price collusion and shadowy agreements on to not infringing others' markets. Such efforts, while quite expensive, might be still economically feasible (Krugman et al 1999). These considerations, developed for the case of modern markets, were also valid for the past, as long as an oligopolistic market segmentation and implicit or explicit price collusion could be supported by adequate levels of demand<sup>20</sup>. Obviously, this presumes more or less steady increases of cash flows – implying overall inflationary conditions of the market. In this positive sum game the market expansion pays for occasional inefficiencies as long as it is still possible to compensate for them. In the case of the high medieval Europe the continuing growth of the market was supported through various means: silver mining<sup>21</sup> (first Saxon, then Bohemian, then Slovenian etc); coin debasements, especially evident from the 14<sup>th</sup> century, but which happened at the earlier dates as well; or speedier transactions through the circuit of fairs, which were up and running from the 12<sup>th</sup> century. All of these devices contributed to the swift growth of the

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<sup>20</sup> We need to stress that oligopolistic market segmentation can be observed up to our days in the developed economies as brand/market leader segmentation through select companies that, taken together, "make the market". Meanwhile, price conspiracies are expressly prohibited by the law and there is extensive anti-monopoly legislation. Thus, modern oligopolies represent the dynamic equilibrium of various parameters, such as brandization, advertisement, goodwill, price wars, legal/patent battles etc, which, taken together, support company-wise market shares.

<sup>21</sup> In a lesser degree, gold mining, since gold was relatively unaffected by the spiralling debasement (Volckart).

high medieval economy and the surging demography in Europe for more than a century, from the 13<sup>th</sup> and up to the start of the 14<sup>th</sup> centuries<sup>22</sup>.

The appearance of a wide range of new economic institutions during the period of the swift growth of the High Middle Ages is well documented. This includes such oligopolistic bodies as the Hanseatic League, Italian cities etc, which often had their distinct and mutually interlocking geopolitical areas and rarely infringed on others' specialist turf. Their rise was facilitated by attempts at minimizing transaction costs under conditions of shortages of supplies characteristic for that period. Among popular devices used were: market segmentation, various medieval-style privileges, guild-like organizations etc. Under these conditions, such bodies as the Hanseatic League, lacking armies, could defy the king of Norway, using a trade blockade, since they controlled the grain market under the overall inflationary conditions of the High Middle Ages.

In this sense, the growth of both the Hanse and the Italian cities was nothing if not the result of the work of "the invisible hand" in its attempt to connect supplies and sales in the most cost efficient way by cultivating interdependent monopolies. Of course, at the end, this attempt backfired, as bodies that grew to cope with shortages of supplies were suddenly faced with the opposite situation of shortages of demand, were found lacking and gradually faded, just as they grew, in interconnected pairs: Novgorod-Hanse, Venetians-Cairo. Ironically, their demise was an indirect result of their own earlier spectacular success in locating new far-flung suppliers, monetizing new, previously unknown goods, and cultivating new, previously unheard-of needs. As the market expanded, it was gradually overstretched, and then, inevitably, flung to the direct

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<sup>22</sup> "... the secular rise of prices between say 1225 and 1345 proceeded at a rate not higher than 0.5 percent per annum" (Postan, ??) (cited from Fischer p.17, endnote 9, pp 317-320)

opposite of a new and much ominous condition of shortages of demand. Its contribution to the start of the early modern era was described in detail above.

## **Conclusion**

Despite its restricted scope, the preliminary analysis above shows the interconnections between the monetary centres and the economies of the resource-exporting periphery between the late Middle Ages and the Early Modern era. They grew and faded synchronously, after developing interlocked and highly specialized infrastructures of procurement and distribution, which proved to be overly dependent on the “good old days” of moderate inflationary conditions of the High Middle Ages. For a while, such conditions could be emulated during the much more tumultuous period of the Late Middle Ages through such means as oligopolistic price collusion and monetary debasement.

Regardless of the initial motivation for debasement – princely greed or market need - it led to the expanding monetization of new arrays of goods from afar, which were brought to the market in a more or less efficient manner by the interlocked oligopolies. The related transaction costs were trimmed to a bearable level by developing economies of scale. For a while, this solution worked, contributing to occasional episodes of intensive growth. As the evidence shows, the resource suppliers grudgingly accepted the debased coins as long as the increases in the sales could compensate for their losses, which they absorbed. However, the related condition of the covert overproduction gradually worsened, eventually tilting the market pendulum (Badalian, Krivorotov 2009) towards a switch from shortages of supplies to shortages of demand. As shown above, this also started a cascade of events, eventually leading to the dawn of the early modern era. Just as the proponents of European

versus British-industrial point of view (O'Brien 2009, Jones 1988, Crafts 1996) have stated, this was happening in Europe, at a much earlier date than the industrial era.

Meanwhile, the system of the oligopolistic traders first grew, in response to conditions of shortages of supplies, and then collapsed, as they reversed to their opposite, conditions of shortages of demand, which they were ill equipped to handle. From the 17<sup>th</sup> century, instead, there was the new world of the early modern nation-states. They cut off the middlemen, replacing them with their royal charter companies. This was the end of a long process. Starting from the second half of the 15<sup>th</sup> century, the deflationary spiral evolved slowly but steadily. Its squeeze caused a switch in the basket of preferred goods, drastically lowering their costs, while no less drastically increasing the volumes. At the end, even the American gold and silver proved inadequate for monetizing the resulting immense array of highly competitive goods. The defaults of the Spanish crown were highly public. The monetary system was at the end stabilized, using new and utterly revolutionary means designed by the Amsterdam bankers. The latter created the foundation for the modern banking, which, finally, was adequate to the size of the new subject on the scene – the young nation-state.

## Bibliography:

- Arel, Maria Solomon. (2004) "The Archangel'sk Trade, Empty State Coffers, and the Drive to Modernize: State Monopolization of Russian Export Commodities under Mikhail Fedorovich". In: *Modernizing Muscovy. Reform and social change in seventeenth-century Russia*. (Kotilaine, Jarmo and Marshall Poe, eds)
- Ashtor, Eliyahu. (1983) *Levant Trade in the Later Middle Ages*. Princeton University Press.
- Badalian, Lucy; and Krivorotov, Victor. (2009) "Technological Shift and the Rise of a New Finance System: the Market Pendulum Model". *The European Journal of Economic and Social Systems*. Summer 2009. Vol. 21 – No. 2/2008. 233-267.
- Blanchard, Ian. (2001) *Mining, Metallurgy and Minting in the Middle Ages. Vol. 1. Asiatic Supremacy. 425-1125*. Franz Steiner Verlag Stuttgart.
- Blanchard, Ian. (2001) *Mining, Metallurgy and Minting in the Middle Ages. Vol. 2. Afro-European Supremacy, 1125-1225*. Franz Steiner Verlag Stuttgart.
- Blanchard, Ian. (2005) *Mining, Metallurgy and Minting in the Middle Ages. Vol. 3. Continuing Afro-European Supremacy, 1250-1450*. Franz Steiner Verlag Stuttgart.
- Bodin, Jean. (1962) .Reponse aux paradoxes de M. de Malestroit. Ed. H. Hauser Paris, 1932, pp.12-15. Cited from Anne Demieul-Cormier *A Time of Glory: The Renaissance in France. 1488-1559*. Doubleday. pp.231-234.
- Cheung, Steven N. S. (1987), "Economic organization and transaction costs". *The New Palgrave: A Dictionary of Economics*. vol. 2, pp. 55–58

- Chilosi, David and Volckart, Oliver. (2010). "Explaining Debasement in the Late Middle Ages: what can we learn from the gold-silver ratios?" Presentation at the seminar on modern economic history. LSE. January 2010.
- Chilosi, David and Volckart, Oliver. (2009) "Money, States and empire: Financial Integration Cycles and Institutional Change in Central Europe, 1400-1520". LSE Working Paper # 132/09.
- Clark, Gregory. (2003) *The Price History of English Agriculture, 1209-1914*. University of California, Davis. [gclark@ucdavis.edu](mailto:gclark@ucdavis.edu).
- Clark, Gregory. (1998) "Microbes and Markets: Was the Black Death an Economic Revolution?" Working paper. University of California, Davis.
- Coase, Ronald (1937). "The Nature of the Firm". *Economica* 4 (16): 386-405.
- Coase, Ronald (1960). "The Problem of Social Cost". *Journal of Law and Economics* 3: 1-44.
- Crafts, Nicholas (1996). "The First Industrial Revolution: A Guided Tour for Growth Economists," *American Economic Review* (May), pp. 197-207.
- Davies, Norman. (1981). *God's Playground. A History of Poland*. Col. 1. The Origins to 1795. . Clarendon Press. Oxford.
- Ehrenkreutz, Andrew. (1992). *Monetary Change and Economic History in the Medieval Muslim World*. Variorum.
- Farmer, D. L. (1988). "Prices and wages," in H. E. Hallam (ed.), *The Agrarian History of England and Wales, Vol. II, 1042-1350*, 716-817. Cambridge: Cambridge University Press.
- Farmer, D. L. (1991). "Prices and Wages, 1350-1500," in Edward Miller (ed.), *The Agrarian History of England and Wales, Vol. III, 1348-1500*, 431-525. Cambridge: Cambridge University Press.

- Findlay, Ronald and Kevin O'Rourke. (2007) *Power and Plenty: Trade, War, and the World Economy in the Second Millennium* (Princeton Economic History of the Western World).
- Findlay, Ronald and Kevin O'Rourke (2003) "Commodity Market Integration, 150-2000". In: Bordo, Michael et al (eds). *Globalization in Historical Perspective*. The University of Chicago Press. Pp. 13-65.
- Findlay, Ronald and M. Lundahl (2002). "Toward a Factor Proportions Approach to Economic History: Population, Precious Metals Prices from the Black Death to the Price Revolution" In: Findlay et al (eds). *Bertil Ohlin: A Centenary Celebration*. Cambridge. MIT Press.
- Fischer, David Hackett. *The Great Waves. Price Revolutions and the Rhythm of History*. 1996. Oxford University Press.
- Jones, Eric. (1988) *Growth Recurring. Economic Change in World History*. The University of Michigan Press.
- Krugman, Paul, Fujita, Masahisa and Venables, Anthony. (1999) *The Spatial Economy - Cities, Regions and International Trade*, MIT Press,
- Kindleberger, Charles. (2006) *A Financial History of Western Europe*. Routledge.
- Mahler et al 2010. Can the Euro Zone Cope with a National Bankruptcy? <http://www.spiegel.de/international/europe/0,1518,679502-4,00.html>
- Martin, Janet. (1986) *Treasure of the Land of darkness. The fur trade and its significance for medieval Russia*. Cambridge University Press.
- Munro, John. (1999) *The Monetary Origins of the 'Price Revolution' : South German Silver Mining, Merchant-Banking, and Venetian Commerce, 1470-1540'*, University of Toronto. WORKING PAPER No. 8, UT-ECIPA-MUNRO-99-02.

- Noonan, Thomas S. "Ninth-Century Dirham Hoards from European Russia: a Preliminary Analysis." *Viking-Age Coinage in the Northern Lands. The Sixth Oxford Symposium on Coinage and Monetary History*, Oxford (1981). (Blackburn M.A.S. and Metcalf D.M. eds).
- Noonan, Thomas S. "When and How Dirhams First Reached Russia: A Numismatic Critique of the Pirenne Theory": *Cahiers du Monde Russe et Sovetique*, 21 (1980), pp 401-469.
- Niehans, Jürg (1987). "Transaction costs," *The New Palgrave: A Dictionary of Economics*, v. 4, pp. 677–80.
- O'Brien, Patrick. (2009) The Relocation and Reconstruction of a Metanarrative in Global History European Expansion Overseas 1415-1825. forthcoming, Annual Proceedings of Fordervereins der Forschungstiftung (Marcus Denzel, ed.).
- Postan, Michael Moïsey. (1972) The medieval economy and society: an economic history of Britain, 1100-1500, University of California Press Berkeley and Los Angeles, California page 227.
- Postan, Michael Moïsey and J.Z. Titow. (1959) "Heriots and Prices on Winchester Manors." *Economic History Review*, 2<sup>nd</sup> ser. 11.
- Volckart, Oliver (2008) "The Big Problem of the Petty Coins, and how it could be solved in the Late Middle Ages". LSE Working Paper 107/08.
- Williamson, Oliver E. (1981). "The Economics of Organization: The Transaction Cost Approach". *The American Journal of Sociology*, 87(3), pp. 548-577.
- Williamson, Oliver E. (1985). *The Economic Institutions of Capitalism: Firms, Markets, Relational Contracting*. New York, NY: Free Press.
- Williamson, Oliver E. (1996). *The Mechanisms of Governance*. Oxford University Press.

Data sources:

- Ashtor, Eliyahu. "Spice Prices in the Near East in the 15<sup>th</sup> Century." *The Journal of the Royal Asiatic Society of Great Britain and Ireland*, No. 1 (1976), pp. 26-41
- Ashtor, Eliyahu. A social and economic history of the Near East in the Middle Ages. London. Collins. 1976.
- Ashtor, Eliyahu. Levant trade in the Later Middle Ages. 1983. Princeton University Press.
- Attman, Arthur. The Russian and Polish markets in international trade, 1500-1650. Publications of the institute of economic history of Gothenburg University, 26. Gothenburg: Kungsbacka. 1973.
- Dollinger, Phillippe. The German Hansa. (DS Ault, SH Steinberg, transl). Stanford University Press. 1970.
- RE: Elers' account book: Doroshenko V. "Torgovlia krupnogo tallinskogo kuptsa v XVI veke" *Izvestia akademii nauk Estonskoi SSR. Obschestvennye nauki* 18 (1969): 332-45
- Doroshenko V. "Russkie sviazi Tallinskogo kuptsa v 30x goda[ XVI v" in *Ekonomicheskie sviazi Pribaltiki s Rossiei*. Pp 47-58.
- Doroshenko V. "Ganza I Livonia. Problemy trgovli XIII-XVIvv. " *Izvestia akademii nauk latviskoi SSR*. No 10. 1965. Pp. 143-7.
- Kazakova N.A. "Iz istorii snoshenii Novgoroda s Ganzoi" *istoricheskie zapiski* 28 (1949): 111-31.
- Khoroshkevich A.L. "Inostrannoe svidetelstvo 1399 g o Novgorodskoi denezhnoi sisteme" in *Istoriko-arheologicheski sbornik*. Pp. 302-7. Avdusin D.A. and V.L. Yanin (eds) Moscow University. 1962.
- Khoroshkevich A.L. "Kredit v russkoi vnutrennei rusko-ganzeiskoi trgovle XIV-XV vv" *Istoria SSSR*. No 2. 1977. Pp. 125-40.
- Khoroshkevich A.L. *Russkoe gosudarstvo v sisteme mezhdunarodnyx otnosheni kontsa XIV- nachala XVI vv*. Moscow. Nauka. 1980.

- Khoroshkevich A.L. "Torgovlia inostrannymi tkaniami v Novgorode v XIV-XV vv" Istoricheskie zapiski 63 (1958): 206-43.
- Khoroshkevich A.L. "Vyvoz voska iz velikogo Novgoroda v XIV-XV vv" in Mezhdunarodnye sviazi Rossii do XVII v. pp 278-305. Moscow: Academia Nauk SSSR. 1961.
- Khoroshkevich A.L. "Znachenie ekonomicheskix svyazei s Pribaltikoi dlia razvitiia severo-zapadnyx russkix gorodov v kontse XV- nachale XVI vv". In Ekonomicheskie sviazi Pribaltiki s Rossiei. Pp. 13-31. Riga: Zinatne. 1968.
- Khoroshkevich A. L "Iz Istorii Ganzeiskoi trgovli (Vvoz v Novgorod blagorodnyx metallov v XIV-XV vv)" In Srednie veka. Sbornik, no. 20. Pp. 98-120. Moscow: Akademia Nauk SSSR. 1961.
- Kleinenberg IE "Serebro vmesto soli: element rannego merkantilizma vo vneshnetorgovoi russkogo kontsa XV-nachala XVI veka" Istorica SSSR. No 2 (1977): 120.
- Kopanev A. istoria zemlevladienia Belozerskogo kraya XV-XVI vv. Moscow. AN SSSR. 1951.
- "Krestianskoe zemlevladienie Podvinia v XVIv" in Problemy krest'anskogo zemlevladienia I vnutrennei politiki Rossii. Pp. 5-44. Leningrad. Nauka. 1972.
- Krest'anstvo russkogo Severa v XVIv. Leningrad. Nauka. 1978.
- "Kurostrovskie stolbtsy XVI v" materialy po istorii evropeiskogo severa SSSR. Severny arkheographicheski sbornik (Vologda) I (1970): 398-431.
- "o gosudarstvennyx nalogax chernososhnyx krest'an serediny XVIv". In. problemy istorii feodalnoi Rossii: sbornik statei k 60-letiu prof. VV Mavrodina. Pp. 127-34. Leningradski Universitet. 1971.
- "Platezhnaya kniga Dvinskogo uezda 1560g" in. agrarnaya istoria evropeiskogo severa. Pp. 519-36. Vologda: 1970.
- Kuchkin V.A. Rus pod igom: kak eto bylo? Moscow. Panorama. 1991.

- Kuzakov VK. Ocherki razvitiia estestvennonauchnyx I texnicheskix predstavleni na Rusi v X-XVII vv. Moscow: Nauka. 1976.
- Lesnikov MP "Ganzeiskaya Torgovlia pushninoi v nachale XV v" Uchenye zapiski Moskovskogo pedagogicheskogo institute imeni Potemkina 8 (1948) : 61-93.
- Lesnikov MP "Niderlandy I vostochnaya Baltika v nachale XVveka. Iz istorii trgovyx snosheni" izvestia AN SSSR seria istorii I filosofii 8 (1951) : 451-9.
- Lesnikov MP "Torgovye otnoshenia velikogo Novgoroda s tevtonskim ordenom v kontse XIV veka I nachale XV veka" istoricheskie zapiski 39 (1952) : 259-78.
- Vostochnaya Evropa v drevnosti i sovremennosti. Spornye problem istorii. Chtenia pamiati V.T. Pashuto. Moscow April 12-14 1993.

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