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## Heckscher on the Slow Monetization of Sweden and His Incidental Refutation of Jevons and Menger

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Department of Economics  
School of Economics and Management

# Heckscher on the Slow Monetization of Sweden and His Incidental Refutation of Jevons and Menger

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## **Heckscher on the slow monetization of Sweden and his incidental refutation of Jevons and Menger\***

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Abstract:

Eli F. Heckscher found that in 16<sup>th</sup> century Sweden: 1) indirect barter was the most common exchange method and 2) monetary exchange was carried out with different coins, none a generally accepted medium of exchange. These findings refute the search and transaction cost models of the emergence of money, which build on Jevons (1875) and Menger (1892). Instead, following up on Heckscher's suggestions, Alchian's (1977) model of money as the most saleable good by being the least costly to evaluate should be the basis for a positive theory of monetization. An increased quality of money causes monetization, which in turn spurs specialization in production. In addition, the government by demanding monetary payments of taxes and expenditures can force agents to overcome high initial costs of switching from barter to monetary exchange.

\* I thank Lars Jonung and participants at seminars at Lund University and the European Society of Economic Thought meeting in Rome 2015 for valuable comments.

## Introduction

Eli F. Heckscher (1930/1953) incidentally refuted two tenets of monetary theory originated by Jevons (1875) and Menger (1892). Incidentally because his purpose was to describe the exchange system in Sweden in the 16<sup>th</sup> century and he did not mention Jevons or Menger. He found that:

- indirect barter was the most common type of exchange, refuting Jevons's (1875) claim that the absence of double coincidence of wants makes money a necessary condition for exchange
- monetary exchange was carried out with different coins, none a generally accepted medium of exchange, refuting Menger's (1892) claim that one coin would spontaneously become a unique medium of exchange.

He used his findings, based on qualitative data, as a benchmark for the study of other periods and argued that non-monetary exchange was common in the medieval period and survived well into the 19<sup>th</sup> century. In other words, monetization was a slow process, which took centuries in Sweden.

Heckscher (1930/1953) was included in the anthology by Lane and Riemersma (1953), jointly published by the American Economic Association (AEA) and the Economic History Association, which I quote from. It has received few citations.<sup>1</sup> Perhaps the article was “too historical for the economists and too theoretical for the historians”, as was suggested by his pupil Arthur Montgomery (1953/2003, p. 325) as a general explanation for why Heckscher's life's work on economic history had a limited impact.

Regarding the economists, Heckscher's timing was unfortunate. The topic of the emergence money was dormant until the 1970s. The new theoretical literature broke a long hiatus after the contributions of Jevons and Menger, with homage paid to both. It considers the thought

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<sup>1</sup> I find nine citations in Google scholar, none of which follows up on his empirical work. A study of Heckscher's impact in general through citations is Sandelin (2006). Today he is primarily known for the Heckscher-Ohlin theory of international trade.

experiment of introducing money into a barter economy. If a monetary equilibrium exists and the public voluntarily chooses it, the model provides “microfoundations for money”.

Regarding the historians, there is a fair amount of work on the *process* of monetization of Europe in the medieval period, which has been synthesized by Spufford (1988). Works by economic historians and economists on monetization are almost absent with the exceptions of Cipolla (1956, ch. 1), Hicks (1989, ch. 5) and Jonung (1983).<sup>2</sup> A related theme is the origin of money, recently developed by the legal historian Desai (2014) from a European perspective. The economists Einzig (1966) and Melitz (1974) discuss so-called primitive money described by anthropologists as potential original money.

There is hardly any overlap between the theoretical and the historical contributions; neither in substance, nor in mutual citations. It appears the theoretical articles are too theoretical for the historians and the historical articles are too historical for the theorists. Heckscher (1930/1953) constitutes an attempt to establish an exchange between theory and history. A renewed effort in his footsteps incorporating modern theory could bring the topic of monetization to the center of economic history as Wesley C. Mitchell (1944/1953, p. 205) hoped, in order

to frame the best account now feasible of the way men came to organize their dealings with each one another on the basis of money payments, the way this scheme spread from one sphere to another, [and] the material and cultural consequences to which it led.

Fittingly this paragraph ends the first essay in the section “Money and prices” in Lane and Riemersma (1953), just before Heckscher (1930/1953).

After presenting Heckscher’s general framework and findings, I discuss how Heckscher’s suggested explanations for slow monetization may be developed with contemporary theory to be tested with quantitative data.

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<sup>2</sup> I cannot find any references to empirical work on monetization in *The Oxford Encyclopedia of Economic History* (2003).

## Heckscher on theory, history, and the exchange mechanism

Heckscher used the terms “natural and money economy” for barter and monetary exchange, originally coined in German by Bruno Hildebrand (1864) and still used by historians.

Heckscher (1930/1953) introduced the topic of natural and monetary economy as a showpiece for the need to use theory in economic history:

Now, if economic theory is at all what it ought to be, its reasoning should apply to economic life as such, and consequently to that of all ages. No doubt much remains to be done in the field of economic theory; but an attempt might at least be made to utilize economic theory for the work of economic history. Our subject [natural and money economy] will illustrate the need for that. Heckscher (1930/1953, p. 2).

His study appeared just after Heckscher (1929/1953), “A plea for theory in economic history”, cited as a forerunner to the postwar “New Economic History”, which also is included in Lane and Riemersma (1953).<sup>3</sup> Heckscher (1929/1953) noted two uses of theory:

... the value of economic theory increases enormously when the work of historians is carried further than the stating of external facts; for its most important use refers to the *choice* of facts and the *explanation* of them. Heckscher (1929/1953, p. 425, Heckscher italics).

For choosing facts, theory for Heckscher meant a typology of exchange systems. He began with a two-part classification of exchange systems:

From an economic point of view nothing in the domain of exchange is at all comparable in importance to the use or non-use of a medium of exchange. Heckscher (1930/1953, p. 208).

The category “non-use of a medium of exchange” was divided into three sub-categories:

a natural economy will then be found to contain no less than three different aspects held together only by the absence of a generally accepted medium of exchange, or currency: absence of exchange, direct exchange, and indirect exchange without money. Heckscher (1930/1953, p. 208).

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<sup>3</sup> See McCloskey (1994).

For explanations of the chosen facts, theory was used to study the effects of the exchange system on the economy in order to show:

... how each of the different forms of exchange and money was working in actual economic life at different times, as well as how they worked into each other... My intention is, ..., to make use of Swedish materials for a problem of general economic history. ... The most interesting part of the subject will be found in the implications and consequences of the methods of exchange. Heckscher (1930/1953, p. 210).

An obvious effect is that barter limits the extent of specialization. Heckscher was also concerned with implications of in-kind payments of rents and taxes to the government, which hindered the development of the public sector. A positive effect of a natural economy was that policy makers would not be subject to mercantilist faulty thinking:

Under natural economy, economic life showed its proper working to the dimmest eye, as real conditions had not been overlaid by the most deceptive of all appearances – the cloak of money. Heckscher (1930/1953, p. 222).

As discussed below Heckscher also sketched the causes of the observed exchange system.

## Heckscher's findings

Exchange mechanisms are prime examples of institutions, which are central to economic history. Heckscher (1929/1953) remarked on the peculiar character of institutions as economic facts, which makes economic history a challenge:

Economic History has an object and materials which are usually more intangible than those of other branches ... and while economic facts are always internal, human, or psychological, like institutions, it has usually been nobody's business to *put them on paper*... It is therefore greatly to be feared that Economic History, of which so much has been expected will be unable to do the work allotted to it unless a clear view is gained of what it really means, which sort of facts it has to work upon. Heckscher (1929/1953, p. 427, my italics).

In the case of the exchange mechanism, a key problem is the paucity of written sources. Even when sources - such as accounts, receipts, and contracts - exist, we do not know if the goods were bartered or exchanged with coins, though often a monetary unit of account is given. Heckscher used as source material the letters and proclamations by the Swedish king Gustav Vasa. This source was unique in Heckscher's view in that it revealed in writing the relevant facts:

His long reign from 1521 to 1560, therefore, presents exceptional opportunities to the student of economic history. He was not only the principal landowner, but also the principal farmer; he was the all-important foreign merchant and the ablest trader within the country, being in fact master in every sort of acquisition, often not too scrupulous; ... When it is added that he had almost a passion for having everything *put upon paper* and brought to account, himself writing - rather dictating - singularly outspoken letters which fill twenty-nine stout volumes in print, it is clear that our opportunity to learn the economic life of Sweden in the sixteenth century is good. Heckscher (1930/1953, p. 210, my italics).

The most striking finding claimed by Heckscher is that indirect exchange was more common than direct barter or monetary exchange. He based his claim on indirect exchange being the dominant type in Gustav Vasa's letters. The finding is striking as it flies in the face of the case against indirect barter as Jevons put it:

The first difficulty in barter is to find two persons whose disposable possessions mutually suit each other's wants. There may be many people wanting, and many possessing those things wanted; but to allow an act of barter, there must be a double coincidence, which will rarely happen. Jevons (1875, ch. I.5).

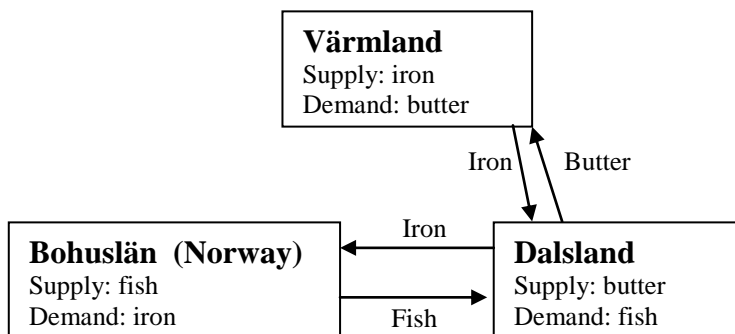
which was echoed by Menger:

Even in the relatively simple case and so often recurring case, where an economic unit, A, requires a commodity possessed by B, and B requires one possessed by C, while C wants one that is wanted by A - even here a rule of mere barter, the exchange of the goods in question would as a rule be of necessity left undone. Menger (1892, p. 242).

Heckscher's prime example of indirect trade is the triangular trade between the three regions Värmland, Dalsland, and Bohuslän. The example appears typical in that it involves interregional trade between producers without a merchant. Trading with merchants was rare as this was only legal in towns, in which less than five percent of the population was living according to Heckscher (1930/1953, p. 211).



The trade is depicted in Figure 1, described in Heckscher (1930/1953, p. 215) and Heckscher (1954, p. 34). Dalsland demanded dried fish supplied by Bohuslän. Bohuslän, in turn, demanded iron. Dalsland, however, did not supply iron, but salted butter. Värmland supplied iron and demanded butter. None of the three possible pairs constitute a double coincidence of wants.

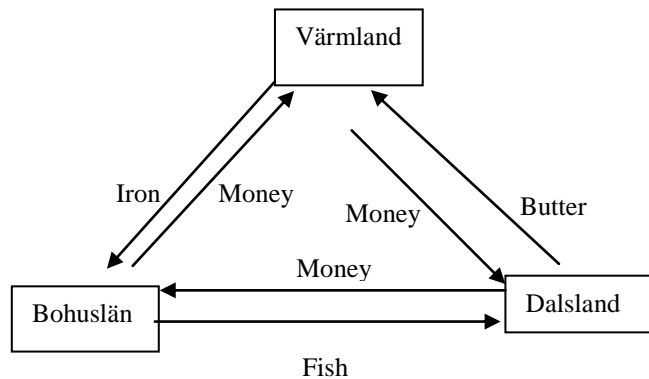


**Figure 1.** Indirect barter with three agents in 16<sup>th</sup> century Sweden.

The solution was indirect trade. Dalsland bartered its butter for iron from Värmland, and in turn bartered the iron for their demanded fish in Bohuslän. Thus iron was the intermediate good with Dalsland as middleman. (Logistically butter or fish could also have been used as the intermediate good.) Note that two of the agents fulfill their desired trade with one transaction and the intermediate agent fulfills it with two transactions, which makes for two transactions in total.

John Hicks (1989, p. 44) claimed that “indirect trade would be a very artificial model and we may be sure that if anything like it was ever achieved in practice, it would soon break up”. For merchants to live on indirect trade they would need coins to realize their gains by trade. In Hicks’s “market model of money” merchants are the agents creating markets and money. In the Swedish case. Dalsland, is a producer and middleman, but not a merchant. Dalsland will be satisfied with the gains from trade in terms of the extra fish it can obtain as middleman and thus explain why indirect trade could persist, contrary to Hicks’s claim.

Figure 2 shows how the problem could be solved with money. Note that each agent will have to trade twice as buying goods is separated from selling goods. In total there will be three transactions as opposed to two transactions in the indirect barter case.



**Figure 2.** Monetary exchange with three agents.

Heckscher's second finding is the "non-fungibility of money", that is, coins were less than fully liquid:

The non-fungible character of trade in general extended even to money, the most non-individual or fungible of all goods. The characteristics of natural economy, in other words, come to light even in those cases where money was actually used: otherwise expressed, money was also in the nature of a commodity. Heckscher (1930/1953, p. 218).

Heckscher (1930/1953) based this finding on a number of observations:

- Monetary and barter transactions exist side by side, often without apparent cause, other than what is immediately available of coins and tradable goods, p. 216.
- Monetary exchange was sometimes combined with barter by the use of coins and goods in a single transaction, p. 217.
- Different coins, domestic and foreign, circulated simultaneously, with less than perfect substitutability, p. 218.
- Traders, like Gustav Vasa, kept separate accounts and separate inventories of different coins, p. 219.

Regarding foreign coins, Heckscher observed that:

... all sorts of foreign coins were continually imported and exported in the days of natural economy, in spite of the insignificance of trade; while at the present time, in spite of an enormous trade between countries, foreign monies practically are confined to tourist traffic. This shows the fundamental “natural economy” character of both money and foreign trade in earlier times, and the opposite in our day. Heckscher (1930/1953, p. 218).

These observations refute Menger’s prediction of monetization with one coin appearing as a generally accepted medium of exchange. Menger (1892) suggested that the process occurs spontaneously through the self-reinforcing process of a certain coin becoming more liquid, or saleable in his terminology, as more people use it.

Heckscher (1936, pp. 635-641) followed up the evolution of monetization for the 17<sup>th</sup> century, which he summarized in English in Heckscher (1954). An effort to monetize the country was made by the government by replacing some of its in-kind transactions by money and a policy of urbanization:

Gustav Adolphus [King 1612-1632] and Axel Oxenstierna [Chancellor 1612-1654] were confirmed adherents to the view that natural economy should be replaced by a money economy, especially in the field of public finances as well as in the country at large. This, incidentally, was one reason for the policy of enthusiastic urbanization. For townsmen could pay in money, while the peasants paid in kind. The great emphasis on customs duties was rooted in the same notion. Heckscher (1954, p. 119).

The idea of townsmen using money agrees with Hicks’s (1989, p. 44) idea of merchants as agents of monetization.

The attempts at monetization of the public finances and indirectly of the whole economy was reversed at the end of the 17<sup>th</sup> century during the reign of Charles XI between 1660 and 1697:

The increasing use of money in public finance so vigorously promoted by Gustav Adolphus and his Chancellor was checked and a deliberate return to a natural economy took place. Once more the revenue of the crown consisted of grain, meat, iron and a score of other commodities. The result of this retrogression was that natural economy in Sweden persisted longer than in any other country. This was especially true in public finances where it might even be

said to have lingered on until the beginning of present century. Heckscher (1954, p. 124).

## Heckscher and the moderns on the emergence of money

Heckscher suggested that indirect barter in 16<sup>th</sup> century Sweden was the lowest-cost exchange system:

On the one hand, the difficulties of barter in a community where private trading prevails are clear. Each of the two parties to an exchange must hold the peculiar position of being at the same time able to offer what the other party wants and wanting what the other party is able to offer, all this at a rate agreeable to both. On the other hand, *the introduction of money is often a difficult operation*. Consequently both direct exchange and money exchange are in many cases out of the question. Heckscher (1930/1953 p. 214, my italics).

His general reasoning follows the same logic as the modern microfoundation of money models: an equilibrium will occur such that the cost of the exchange system is minimized. From Heckscher's triangular example in Figure 1, we may reason about the size of the costs associated with indirect barter and the cost of "introduction of money" to execute the indirect exchange.

The microfoundation theories demonstrate how the introduction of money reduces barter costs arising from:

- 1) *transaction costs* for shopping by reducing the number of trading posts, Ostroy (1973), Starr (2012).
- 2) *search costs* for buyers and seller by reducing the search for a double coincidence of wants, Jones (1976), Lagos and Wright (2005).
- 3) *quality assessment costs* of goods by the services of specialized merchants who use money as the good which can be recognized by everybody, Alchian (1977), Banerjee and Maskin (1996).

The cited authors from the 1970s belong to the progenitors of the three strands of microfoundations.<sup>4</sup> Each strand is also represented with one recent contribution, which all are formal general equilibrium models. All of the contributions, except Alchian (1977), assume the absence of double coincidence of wants. They also rely on one good with superior qualities as a medium of exchange. Starr (1972) who formulated an early formal model of the superiority of monetary exchange expressed his result as:

... anything a barter economy can do a monetary economy can do better (or as well), at least in the case where the monetary system itself is costless. Starr (1972, p. 302).

Heckscher's logic requires that the costs of indirect exchange are lower than the costs of monetary exchange.<sup>5</sup> Meliz (1974, p. 59) analyzed the triangular case and concluded that search costs would be higher with indirect exchange, but relative transaction costs are undetermined.

To illustrate the possibility of indirect exchange being cheaper than monetary exchange, even allowing for costless transfers of money, consider Heckscher's example shown in Figure 1. Since the middleman Dalsland is geographically located between Värmland and Bohuslän, transportation costs were minimized. Regarding search costs, they could presumably be very high for first finding out this particular triangular loop. If the trade is repeated, these costs would shrink substantially. Repetitive trade would also bring down quality assessment costs of the goods to a minimum through reputation and experience.

Now consider the costs with monetary exchange. Transportation costs would be larger compared to barter since there will be three trips instead of two trips as illustrated in Figures 1 and 2. Inventory costs of goods would not be affected by the introduction of money, if production and shopping follow a yearly pattern. Monetary exchange, however, involves the extra inventory cost of procuring and maintaining the money supply as noted by Melitz (1974, p. 62). With a velocity of money of one transaction per year, the new money would represent

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<sup>4</sup> The listed authors were active at UCLA in the 1970s. Two other early articles are Clower (1967) and Brunner and Meltzer (1971), also at UCLA.

a whole year's production for one of the goods, or a third of the production in the triangular loop. This is a one-time cost, so if the money could be borrowed, the yearly cost would be the interest cost of the money loaned. While loans are possible in a barter economy, borrowing money would presuppose at least a partial monetary economy. The switching cost from barter to money will in all likelihood be a large proportion of the value of the goods traded, represented by the produce which will have to disappear from the closed triangular loop to procure the money.<sup>6</sup>

Fixed costs of switching between different monies/coins have been considered by Dowd and Greenaway (1993). They analyzed switching from one currency to another such as the euro, in the context of positive network externalities as in Menger (1892). With switching costs, the Menger effect may never get to work.<sup>7</sup> Heckscher's argument that "the introduction of money is often a difficult operation" is analogous, while referring to the switch from barter to money.

A switch from barter to monetary exchange may occur as a result of deliberate effort of the government to change from in-kind to monetary payments. Such an effort in the 17<sup>th</sup> century Sweden failed, however, to switch the whole economy to monetary exchange according to Heckscher:

Gustavus Adolphus and Axel Oxenstierna worked to provide a greater role for money economy in the public finances; but for private business nothing appears to have been done to extend the money economy... At the same time the complicated and haphazard character of the monetary system probably contributed to hamper a general change to monetary exchange. Heckscher (1936, p. 641).

Thus the absence of a common medium of exchange and unit of account hampered monetization. This suggests that there was no coin with a high enough quality, which would minimize total quality assessment costs of all goods as suggested by Alchian (1977). Had there been such a coin, a Menger process would have chosen it. Low-quality coins thus may constitute a second cost barrier against monetization.

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<sup>5</sup> Starr (2012, ch. 12) derived the conditions for monetary exchange to be chosen over indirect barter for the trading-post model. These conditions yield Jevons's condition of the absence of double coincidence of wants as a necessary condition for monetary exchange.

<sup>6</sup> Alternatively, doubling velocity would halve the real balance, but would double the fixed costs associated with the trips.

<sup>7</sup> See Stenkula (2003) for the connection between Menger and the network aspect of money.

Conversely, monetization can increase if these costs decrease. One possibility suggested by Heckscher's example is that the state acts as a prime mover for monetization by: a) supplying high-quality coins through payments for state expenditures, and b) demanding high quality coins for taxes. It starts a so-called bandwagon effect by forcing the one-time switching cost on the public, which is reinforced by the increasing convenience of the high-quality coins through a Mengerian network effect. The idea of the government as a first mover in monetization, which then takes off in a Mengerian fashion, suggests that the "two views of the origin of money" held by the "Cartalists" and "Mengerians", cf. Goodhart (1998), may be complementary.

The two fundamental determinants of monetization, following Heckscher, are technology and the state's degree of reliance on monetary taxes and expenditures. New technology affects the monetization in two ways: 1) by spurring further specialization which increases the gains from monetization, and 2) by improving the quality of the coins. A fascinating example by Selgin (2008) of how a new technology affects both the degree of specialization and the quality of coins is the invention of the steam engine in Great Britain. The private sector minted high-quality small token coins with steam-engine presses, which were redeemable in gold. These coins, "good money", were necessary to pay the workers in the new industries. Without them, the specialization associated with the industrial revolution may have been thwarted.

Both Jevons and Menger stated that high-quality coins are necessary condition for monetization. Jevons (1875, ch. V) discussed the properties of desirable coins in detail. Menger (1892, section VIII) briefly described the same properties. Thus they indirectly suggested that the evolution of coin quality is a determinant of monetization. Two of the desired properties of coins considered by Jevons (1875, chs. V.13 and V.17): "divisibility" and "cognizability", appear especially relevant as explanatory factors behind gradual monetization as they were subject to gradual technical change.<sup>8</sup>

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<sup>8</sup> The two properties are connected as pointed out by Cipolla (1956, ch. 2). The difficulty of providing coins in small denominations, "The big problem of small change" in Cipolla's words, was solved by the introduction of token money of high cognizability. See further Sargent and Velde (2003) and Selgin (2008).

In conclusion, monetization according to Heckscher arises from the government's need for monetary payments (and possibly seigniorage) provided there are good coins (publicly or privately produced) which facilitates trade. His findings are consistent with Alchian's (1977) model which shows how good money is necessary for specialized traders, which in turn are a prerequisite for specialization in production.

Monetization paves the way for specialization by reducing search and transactions cost, but is not caused by these costs as demonstrated by Heckscher's refutation of Jevons and Menger. The search and transaction cost models assume that the absence of a double coincidence of wants constitutes an insurmountable problem which cannot be solved with indirect barter, but which is solved with the introduction of a high-quality coin. By showing monetary exchange to be a unique Nash equilibrium for a highly specialized economy, these models not only collapse history to a sudden switch from barter to monetary exchange, but also reverse causality relative to history. The explanation of monetization by search and transaction costs amounts to an inadmissible teleological explanation.

## **Conclusion**

Heckscher (1930/1953) analyzed the state of monetization in 16<sup>th</sup> century in Sweden: a period between the introduction of money and today's completely monetized economy. Heckscher's broader concern was the process of monetization - not the start, nor the end; just as evolution is at the center of attention in biology. Monetization took centuries due to: 1) the cost of introducing money to replace direct and, in particular, indirect barter and 2) the costs associated with low-quality money. Monetization was part of the technological and institutional development process which led to modern market economies with a myriad of goods, of which each person consumes hardly an iota, and a perfectly divisible and cognizable, unique money.



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