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FACTORS OF INCOME INEQUALITY AND THEIR INFLUENCE MECHANISMS: A THEORETICAL OVERVIEW

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Abstract

When analysing the factors of income inequality, first as many factors as possible have to be included in order to obtain valid results. The present article systematises the factors of income inequality discussed in the pertinent literature into five groups and summarises the hypotheses about the signs of the influences of the discussed factors on income inequality. But additionally the influences between the factors themselves that form indirect effects on income inequality have to be included. In this article, these influences are discussed and arranged in a system to give an idea about the possible indirect effects on income inequality of all the factors discussed in the article.

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INTRODUCTION

Although there is copious literature about the factors of income inequality, no complex theory comprising all the hypothetical factors of income inequality can be found. Most of the articles in this field concentrate on either a single factor or a few factors. Indeed, there are also studies examining more factors (e.g., Nielsen, 1994; Gustafsson and Johansson, 1997; Nielsen and Alderson, 1997; Xu and Zou, 2000; Clarke, Xu and Zou, 2003), but they are not intended to cover all the factors of income inequality discussed in the pertinent literature. While such an approach enables a more insightful discussion of the possible mechanisms of influences, it is questionable whether the results of such an empirical analysis reflect the reality in the best possible way. The same doubt is expressed by Parker (1999). The relationship between two variables, in addition to a causal relationship, inevitably involves a non-causal relationship induced, for example, by the third variables influencing both variables under discussion. If the empirical analysis covers only these two variables, the results about the causal relationship can be misleading. For example, in the case presented in Figure 1, if the second factor is omitted, it is not possible to tell apart the causal and non-causal relationships between the first factor and income inequality. Therefore it would be necessary to include into the analysis as many factors as allowed by the available data.
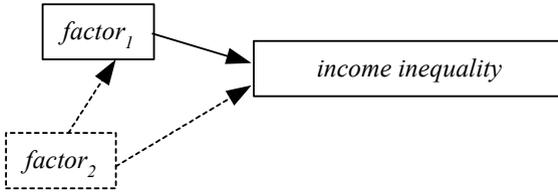
Figure 1. A fragment of the system of the factors of income inequality.

Further, if the analysis includes as many factors of income inequality as it is possible to include, it is reasonable to expect that the factors have causal interrelationships between themselves. So, in addition to their direct effect, many of the factors exert an indirect effect on income inequality through the other factors. For example, the second factor in Figure 1 has a direct effect on income inequality, but also an indirect effect through the first factor. Thus, the total effect of each particular factor on income inequality comprises a direct and indirect effect. The indirect effect can be quite different from the direct one and sometimes even has the opposite sign. So, the total effect can also differ remarkably from the direct effect, yet only the direct effect is estimated if the interrelationships between the factors are not taken into account. In economics we are usually interested in the effect of one variable on another *ceteris paribus*. A change in income inequality, which is caused by the change of the particular factor, includes both the direct and indirect effect and is best described by the total effect of this factor on income inequality. Therefore, when analysing the factors of income inequality, all presumable interrelationships between these factors have to be included.

The first part of the present article systematises the factors of income inequality that have been discussed in the literature to-date into the following five groups: economic development, demographic factors, political factors, cultural and environmental factors, and lastly, macroeconomic factors. The hypothetical

signs of the influences of the previously discussed factors are considered and summarised in a table. As pointed out before, it is important to additionally take account of the indirect effect of these factors which consists of the influences between them. Therefore the second part of the article reviews the influences which form the chains of indirect effects. These influences are systematised on the basis of the influencing factor. Finally, all the influences between the discussed factors are drawn together into a single diagram.

1. THE FACTORS OF INCOME INEQUALITY

In this part, all these factors of income inequality are introduced which have been proposed in previous literature as known to the author of this article. The theoretical hypotheses and the results of earlier studies about the character (sign)[2] of these influences are discussed. It is worth mentioning that often it is not clear whether the authors of previous studies have discussed the direct or total effect of a particular factor. The factors of income inequality are taken to fall into the following categories: economic development, demographic factors, political factors, cultural and environmental factors, and macroeconomic factors.

1.1. Economic development

In previous literature on factors of income inequality, the factors related to economic development have undoubtedly got most attention. These factors are: a country's wealth (mostly measured as GDP per capita), economic growth, technological development and the development of economic structure.

Most of the studies about a country's wealth and income inequality rest on Kuznets' (1955) hypothesis about an inverted U relationship: as the GDP grows, inequality will first increase and then will start to decrease. This hypothesis was supported by the data available at the time when the labour force was

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[2] Sometimes it has also been called as the direction of influence, but here direction is understood as the direction of causality: from which variable to which the causal relationship goes. Whether the influence (effect) is positive or negative, is indicated by the sign of the effect. Here and hereafter the positive influence means that an increase in the value of one variable will cause an increase in the value of another variable; in the case of a negative influence, an increase in the value of one variable will cause a decrease in the value of another variable.

moving from agriculture to industry. One explanation offered is that income inequality between sectors, for example, the less productive agricultural sector and the more productive industrial sector, is greater than inequality within them. Then at the beginning of the movement of labour force income inequality increases, but starts to decrease when most of the labour force is already in the industrial sector or the movement between the sectors has equalised the rates of return in both sectors (Ferreira, 1999b). There are also other hypotheses about the influence of a country's wealth on its income inequality. Chang and Ram (2000) have proposed that if a country's wealth increases, its wealthy people as entrepreneurs and resource owners have more opportunities to increase their incomes.

In addition to a large number of articles testing Kuznets' hypothesis, most of the analyses covering several factors of income inequality have also included GDP per capita. Kuznets' hypothesis is supported by many analyses using various data. For example, Higgins and Williamson (1999) used panel data for the 1960s to 1990s, Clark, Xu ja Zou (2003) panel data for 1960–1995, similar data were used by Barro (1999). Nielsen and Alderson (1997) analysed data about U.S. counties in the years 1970, 1980 and 1990, Weede and Tiefenbach (1981) studied a cross-section from 1965. All these studies have found support to the inverted U hypothesis. On the other hand, Ram (1997) analysed the panel data of developed countries for 1951–1992 and found an un-inverted U-curve: with the increase in the GDP, income inequality decreased in the 1950s and 1960s, but increased from the 1970s on. Analogical results were yielded by an analysis of U.S. counties in a similar period (Ram, 1991). In the study by Gustafsson and Johansson (1997) about OECD countries in the years 1966–1994, a country's wealth turned out to be insignificant as a factor of income inequality. Hence, there is no clarity about the influence of a country's wealth on income inequality. A more exhaustive overview of the articles about a country's wealth and income inequality can be found in Glomm (1997).

Some studies have used energy consumption per capita as an indicator of a country's wealth. Muller (1988), for example, found an inverted U relationship between energy consumption and income inequality, using a cross-section of the years 1965–1975. Nielsen and Alderson (1995) got the same result, analysing the panel data for 1952–1988. However, Nielsen (1994) used both energy consumption and GDP per capita in turn and in a cross-section of 1970 both indicators appeared to be insignificant as factors of income inequality. Nevertheless, the per capita GDP is mostly used as an indicator of a country's wealth.

Whereas the labour force movements between different economic sectors play an important role in the formation of inequality, the development of economic structure (the shares of agricultural, industrial and service sector in the whole economy) has to be taken into account as a factor of income inequality. Gustafsson and Johansson (1997) included into their analysis, in addition to the per capita GDP, the shares of labour employed in the industrial and service sectors. This choice can serve as an explanation for the aforementioned insignificance of a country's wealth as a factor of income inequality in this study. The studies by Doessel and Valadkhani (1998), and Clarki, Xu and Zou (2003) also allow us to assume that the influences exerted by a country's wealth and by the development of its economic structure on income inequality can overlap to some extent.

The level of development of the economic structure has also been described with the derived indicators. Abdel-Ghany (1996) used the ratio of manufacturing workers to service workers as a factor of income inequality. Some studies (Nielsen, 1994; Nielsen and Alderson, 1995; Nielsen and Alderson, 1997) used the indicator of sectoral dualism, which describes the income inequality between the sectors. In case of two sectors, it can be found by subtracting, for example, the agriculture's share of the GDP from the share of the labour force employed in agriculture (Nielsen and Alderson, 1995). However, nowadays already three sectors have to be taken into account, so more complex derived indicators are needed. As the methods used in different

studies are not comparable, no unique assumption can be made about how the development of economic structure influences income inequality. However, it can be assumed that like the influence of a country's wealth, the influence of the development of economic structure is nonlinear.

In addition to the GDP per capita, its growth as an indicator of economic growth is analysed as a factor of income inequality. It is taken for granted that a faster economic growth involves greater entrepreneurial activity and so the incomes converge to rich people who are able to invest and benefit from the economic growth (Chang and Ram, 2000). Edwards (1997) analysed a cross-section of the 1970s and 1980s, finding that a faster economic growth increases income inequality. The study of Xu and Zou (2000), based on data about China, yielded similar results. However, the empirical analysis of Chang and Ram (2000) using a cross-section of the 1980s showed that a faster growth, on the contrary, reduces income inequality. In the study of Ahluwalia (1974), who used a cross-section of the 1960s, the economic growth turned out to be not significant at all as a factor of income inequality. Unfortunately, there has been no significant discussion about the mechanisms of this possible influence. Therefore, no unique assumption can be made about the influence of economic growth on income inequality.

Often technological development has been analysed as a separate factor of income inequality. For instance, Cornia and Kiiski (2001) found that technological development is one of the most important factors of income inequality in developed countries, while in other countries the influence is weaker. The mechanism of the influence can vary, according to Snower (1999). In case of intensive changes in technology, the wages of skilled workers are increasing, while the wages of unskilled workers remain on the same level. In case of extensive changes, skilled workers will take over the jobs of unskilled workers; both the demand for skilled workers and their wages increase, while the demand for unskilled workers and their wages decrease. According to Bresnahan (1997), who analysed the impact of computerisation on income inequality, computerisation too

increases income inequality. Consequently, technological deve-
lopment is supposed to increase income inequality. However, it
has to be admitted that this influence has mostly been analysed
in rather theoretical studies, there being no commonly used
indicators for technological development.

1.2. Demographic factors

The next group of factors of income inequality involves
demographic factors, such as urbanisation, age structure of
population, and composition of households, and also includes
factors related to education such as the population's educational
level, education inequality, and education expenditure. These
factors have also been widely studied in previous literature.

There are contradictory assumptions about the influence of
urbanisation on income inequality. Crenshaw (1993) showed
that higher population density is associated with lower ine-
quality, explaining it with better possibilities for advanced
social organisation in case of higher population density. On the
other hand, Nielsen and Alderson (1997), and Litwin (1998)
found that higher population density and urbanisation increase
inequality: income inequality is usually higher in urban than in
rural areas. In the study of Li, Squire and Zou (1998), using
panel data for 1947–1994, and also in the work of Xu and Zou
(2000), which used Chinese data, the influence of urbanisation
on income inequality turned out to be insignificant.

The influence of the age structure on income inequality is not
clear, either. According to Deaton and Paxson (1997), older
people have a larger dispersion of incomes and so a larger share
of older people in population leads to higher income inequality.
This idea is supported by the empirical analysis of Deaton and
Paxson (1997) using four countries' data. On the other hand,
Higgins and Williamson (1999) studied panel data for the 1960s
to 1990s and found that a larger share of the population aged
40–59 in population aged 15–69 decreases inequality. It can be
assumed that a larger share of older and more experienced

people reduces demand for them and the wage premium for experience, so the overall inequality is lower (Higgins and Williamson, 1999). In Nielsen and Alderson (1997) it appeared that the influence of the share of elderly people (ages 65 and older) on income inequality in U. S. counties was different in different decades. The studies of Gustafsson and Johansson (1997) about OECD countries in the years 1966–1994, and by Muller (1988) using a cross-section from the years 1965–1975 both showed that a larger share of children (aged 0–14) increases income inequality. This can be explained by the assumption that the birth rate is higher in families with a smaller income and so the incomes per family member become even smaller in this group of population, and hence the overall inequality increases.

As income inequality is mostly measured on the basis of the average income of the household members, the composition of household plays an important role in forming income inequality. It has been presumed that the more different the types of households, the higher the income inequality, because the households of different types have different incomes per household member (Wilkie, 1996). Larger households are more able to equalise the income per household member, so, as the average number of household members decreases (children leave their parents earlier, fewer marriages and more single persons), the overall inequality increases (Blank and Card, 1993). Most studies have focused on the impact of the proportion of single-female-headed households. Whereas such households usually have one employed person instead of two like in the traditional family type, it is assumed that single-female-headed households have a lower income per household member and so the overall inequality is higher in case of more single-female-headed households (Partridge, Partridge and Rickman, 1998). This assumption is supported by many studies using U.S. data, such as Maxwell (1990), Nielsen and Alderson (1997), Bishop, Formby and Smith (1997), Partridge, Partridge and Rickman (1998), and Chevan and Stokes (2000).

The population's educational level and education inequality are undoubtedly the most actively discussed factors of income inequality. Although it is often argued that the spread of education reduces income inequality (Nielsen and Alderson, 1995; Chu, 2000; Sylwester, 2002), the average level of education and educational variations have to be distinguished between. The average number of school years is often used as a measure for the educational level of the population and the results are contradictory again. For instance, Partridge, Partridge and Rickman (1998) found that income inequality was lower in U.S. counties with more average years of education. On the other hand, for example Sylwester's (2002) study, which used a cross-section of 50 countries, showed that countries with a higher average number of school years had also higher income inequality.

Theoretically, higher education inequality should be associated with higher income inequality, as a higher educational level should duly ensure a higher income. This assumption is supported by the studies of Chiswick (1971), and Cornia and Kiiski (2001) using international cross-section data. Nielsen and Alderson (1997), who used the indicator of educational heterogeneity, found that in U.S. counties in 1970–1990 the inequality-increasing influence of higher educational heterogeneity had become stronger in time. In some studies, the shares of population with different levels of education are used. According to Chevan and Stokes (2000), higher shares of population with both low and high educational levels are usually associated with higher income inequality, which is partly supported also by their analysis of U.S. data. Hence, education inequality can be assumed to increase income inequality. Very often also the indicators of school enrolment are used, but as their function is to enable to predict the educational level in the future rather than now, it would be premature to assume their impact on the income inequality at present. Therefore, the indicators of education inequality should be preferred.

Education expenditure is also often analysed as a factor of income inequality[3]. The government's expenditure on education can reduce income inequality if poorer people have access to public education. If their income is too low, they cannot benefit from public education and thereby income inequality even increases (Sylwester, 2002). Sylwester's (2002) empirical analysis of 50 countries showed that countries with larger government's expenditure on education have lower income inequality. However, it is possible that in countries whose government spends more on education, the government's total expenditure and hence the expenditure on redistributive transfers is larger, too. So the relationship between education expenditure and income inequality can be non-causal and derive from common causes instead. Doessel and Valadkhani (1998), for example, studied the years 1967–1993 in Iran. They included both the government's total and its educational expenditures into the analysis, and the total government expenditure turned out to reduce income inequality, while education expenditure had no significant effect on it. So, the influence of education expenditure on income inequality is questionable and requires further analysis.

1.3. Political factors

There are also political factors that are supposed to influence income inequality, such as the shares of the government and the private sector, democratisation, liberalisation, etc.

The share of the government sector[4] in economy is mostly measured as the share of government expenditure in the GDP.

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[3] Although education expenditure can also be classified as a political factor, the author has preferred to hold together all the factors concerning education.

[4] The share of the government sector can also be considered as a macroeconomic factor since it has an important role in macroeconomic processes. Yet, as the amount of the government's expenditure

A large proportion of government expenditure is formed by transfers, such as pensions, subsidies, grants, which have a redistributive and equalising function in society. Hence, a higher share of the government sector should bring about lower income inequality. In addition, earnings inequality in the public sector is usually lower than in the private sector (Gustafsson and Johansson, 1997), which is the second possible mechanism of the inequality reducing influence of the share of the government sector. The inequality-reducing influence of the share of the government sector has appeared in many panel data studies: Durham (1999), for example, analysed the years 1960–1992, Gustafsson and Johansson (1997) the years 1966–1994, Clarke, Xu and Zou (2003) the years 1960–1995. Stack (1978) got the same result using a cross-section from the 1960s. However, the inequality-reducing influence of government expenditure depends on the share of transfers in total expenditure. If most of the government's expenditure is addressed to more well-to-do people, government expenditure can, on the contrary, increase income inequality (Xu and Zou, 2000; Clarke, Xu and Zou, 2003). The work of Blejer and Guerrero (1990) showed that higher income inequality was connected with larger government expenditure which was addressed to industrial projects benefiting rich people rather than to social insurance. Consequently, there is no clear assumption about the influence that the share of the government sector can exert on income inequality.

Since the shares of the government and private sectors are connected unambiguously (if one increases, then the other one decreases), there is no need to include the share of the private sector into the analysis that already includes the government sector. The share of the private sector in economy has been taken into account mainly when analysing transition countries. Ferreira (1999a), for example, points out that privatisation increases income inequality, because the hitherto poorer people have fewer chances to benefit from privatised assets. The

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is a political decision, it is considered as a political factor in the present article.

second reason is higher earnings inequality in the private sector (Ferreira, 1999a). These findings are in accordance with the assumption about the inequality-reducing effect of the share of the government sector.

There exists no unique and widely used indicator of democratisation. In a more democratic society, poor people have more political rights and possibilities to achieve larger redistribution and a more even distribution of income (Sirowy and Inkeles, 1990; Gradstein and Milanovic, 2002). Gradstein and Milanovic (2002) found that the expansion of franchise has reduced income inequality. Li, Squire and Zou (1998) analysed the panel data of 49 countries for the years 1947–1994 and found that an improvement in civil liberties reduces income inequality. Lundberg and Squire (2003) obtained similar results using similar data. On the other hand, it is argued that it is simpler to accomplish the redistribution in authoritarian societies (Sirowy and Inkeles, 1990). Further, the higher centralisation of an authoritarian regime involves more opportunities to diminish the differences between incomes in different regions (Durham, 1999). Crenshaw (1993), for example, found an inequality-increasing influence of democracy using a cross-section of the year 1970. Nielsen and Alderson (1995) showed that income inequality used to be significantly lower in the communistic countries. However, in the studies of Nielsen (1994) and Nielsen and Alderson (1995) the index of political democracy, in the work of Higgins and Williamson (1999) the index of civil liberties and political rights, and in the study of Durham (1999) different indicators of democracy appear to be insignificant in determining income inequality. Some authors have pointed out that it is the length of democratic experience that matters and not the current state of democracy (Nielsen and Alderson, 1995; Gradstein and Milanovic, 2002). Muller (1988), for example, used a cross-section of the years 1965–1975 and found income inequality to depend on the age of democracy. Consequently, there is still no clarity about the influence of democratisation on income inequality. A more exhaustive overview of relevant articles can be found, for example, in Durham (1999).

Policy liberalisation has also been discussed as a factor of income inequality. Stewart and Berry (2000), for example, conclude that liberalisation on the whole increases income inequality. The empirical analysis of Cornia and Kiiski (2001) showed that in 32 countries in the years 1985–1990 the reforms on average had an inequality-increasing influence. Unfortunately, the empirical analysis of the impact of liberalisation on income inequality is constrained by the lack of appropriate indicators of liberalisation. Liberalisation indexes which synthesise different aspects of liberalisation are not available for all countries or for all periods of interest. Since reforms in different spheres may affect income inequality in various ways, it makes sense to analyse the influence of the diverse aspects of liberalisation separately. The liberalisation of foreign trade can be analysed as a macroeconomic factor, whereas smaller redistribution and privatisation have already been discussed together with the share of the government sector.

1.4. Cultural and environmental factors

In the formation of income inequality, an important role is played by cultural and environmental factors. This group of factors comprises land concentration, cultural variation, shadow economy, corruption and also the abundance of natural resources.

In countries with historically characteristic higher land concentration, the higher inequality of land rent is associated with higher income inequality as a whole. Lundberg and Squire (2003), for example, analysed the panel data of 38 countries and found that higher land concentration increases income inequality. Similar results can be found in Crenshaw (1993). However, the income inequality increasing effect of land concentration has diminished in the course of time, as shown by Cornia and Kiiski (2001) who compared the periods 1970–1974 and 1990–1999. In the study of Gupta, Davoodi and Alonso-Terme (2002) who used the data about the years 1980–1997,

land concentration turned out to be insignificant in determining income inequality. So, it is assumed that higher land concentration increases income inequality, but the influence becomes weaker in time.

There are very few studies about the influence of cultural traditions on income inequality. Nor is there a common indicator describing cultural traditions and their variations. It is assumed that in case of larger ethnic heterogeneity people are less interested in redistribution and therefore income inequality is higher (Clarke, Xu and Zou, 2003). Clarke, Xu and Zou (2003) found support for this assumption from the panel data of 91 countries for the years 1960–1995. Gradstein, Milanovic and Ying (2001) analysed the panel data of 126 countries for the years 1960–1998, discovering that income inequality depends on the religious traditions of a particular country. The same dependence emerged from the study of Partridge, Partridge and Rickman (1998) concerning U.S. counties. Muschinski and Pickering (2000) analysed the influence of tribal cultural characteristics on income inequality in North America. Unfortunately, the specific nature of this study makes it complicated to compare the results with other studies. So it can be said that while cultural variation is likely to increase income inequality, this influence needs further and more in-depth analysis since most of the studies of income inequality factors have omitted it (Muschinski and Pickering, 2000), often probably due to lack of data.

Shadow economy and corruption are phenomena that are directly connected to cultural traditions. A theoretical analysis of the relationship between shadow economy and income inequality can be found in Rosser and Rosser (2001) who point out that if the share of shadow economy increases, the inflow of taxes and possibilities for redistribution will decrease, and hence, income inequality may increase. The influence of shadow economy on income inequality seems not to have been studied empirically, probably because of problems with measuring shadow economy. The influence of corruption on income inequality was studied by Gupta, Davoodi and Alonso-Terme

(2002) by means of a cross-section of the years 1980–1997. They found that a higher level of corruption leads to higher income inequality because in more corrupt societies wealthy people have more opportunities to take advantage of the redistribution and use it in their own interests.

The abundance of natural resources is usually considered to be inequality-increasing. In the case of abundance of natural resources, for example, of minerals and metals, the production is capital-intensive rather than labour-intensive, requiring more skilled than unskilled workers. According to the demand for labour, the wages of skilled workers are higher and the wages of unskilled workers lower. (Cornia and Kiiski, 2001) In addition, the abundance of natural resources is often associated with a higher concentration of ownership and rent, which in their turn increase income inequality as a whole (Gupta, Davoodi and Alonso-Terme, 2002). Gupta, Davoodi and Alonso-Terme (2002) included the share of natural resources in exports into their analysis of a cross-section of the years 1980–1997 and it appeared to be an inequality-increasing factor. On the other hand, Williamson (1997) used a cross-section of 1965–1990 and in his case the abundance of natural resources proved to be an insignificant factor of income inequality. Cornia and Kiiski (2001) compared the periods 1970–1974 and 1990–1999; their results show that the inequality-increasing influence of the abundance of natural resources has diminished in the course of time. So, similarly to land concentration, it can be assumed that the abundance of natural resources does increase income inequality, but the influence becomes weaker in time.

1.5. Macroeconomic factors

In the last two decades, macroeconomic factors have been considered as factors of income inequality as well. It has to be noted here that even though economic development can be classified as a macroeconomic factor, it was reasonable to consider the factors related to economic development in a

separate chapter because of the much greater attention that they have got in pertinent literature. Inflation, unemployment, financial development, export, import and foreign investments are considered as macroeconomic factors.

As regards inflation, there is no common view about its influence on income inequality. It has been argued that inflation affects poorer people by devaluating fixed nominal incomes (pensions, subsidies) and thus increases income inequality (Gustafsson and Johansson, 1997; Parker, 1999; Xu and Zou, 2000; Cornia and Kiiski, 2001). The inequality-increasing influence of inflation was disclosed by the study of the Philippines performed by Blejer and Guerrero (1990) and the work of Xu and Zou (2000) who used Chinese data. The same view is supported by Edwards' (1997) analysis. On the other hand, there are several studies, according to whose results the influence appears to be inequality-decreasing: Gustafsson and Johansson (1997) used panel data of different countries, Jäntti (1994), and Johnson and Shipp (1999) analysed U.S. data. Lastly, Creedy and van de Ven (1997) concluded from their analysis of Australian data that inflation has no influence whatsoever on income inequality. Dimelis and Livada (1999), too, point out that the influence may depend on the country analysed. Hence, no solid assumptions can be made about the influence of inflation on income inequality.

The influence of unemployment on income inequality is not clear, either. Yet, according to Gustafsson and Johansson (1997), and Parker (1999), there are more empirical analyses indicating the inequality-increasing influence than analyses showing the opposite. This is explained by the supposition that unemployment hurts primarily people with lower income (Gustafsson and Johansson, 1997; Dimelis and Livada, 1999); there exists unemployment inequality and poorer people lose their jobs more often and so their incomes become even lower (Blank and Card, 1993; Johnson and Shipp, 1999; Parker, 1999). There are several empirical analyses showing that an increase in unemployment leads to an increase in income inequality: Jäntti (1994) and Abdel-Ghany (1996) analysed U.S.

data, Sharpe and Zyblock (1997) data from Canada, and Blejer and Guerrero (1990) the case of the Philippines. On the other hand, Nielsen and Alderson (1997) found that in the U.S.A., higher unemployment was associated with lower income inequality in the year 1980. In the years 1970 and 1990, this influence was insignificant. There are also studies which show no influence at all, for example, Blank and Card (1993), and Johnsson and Shipp (1999) analysed U.S. data, and Gustafsson and Johansson (1997) panel data of different countries. Consequently, as most of the studies on this issue have analysed the data of one country at a time, the influence of unemployment on income inequality would need further analysis by means of international panel data.

The influence of financial development has got less attention as a factor of income inequality. Clark, Xu and Zou (2003) analysed the panel data of 91 countries for the years 1960–1995, using the private credit and bank assets to GDP ratio as a measure of financial development. Their analysis showed that financial development provides a better access to loans to poorer people, accordingly giving them an opportunity to increase their incomes by investing into education or entrepreneurship. Hence, financial development reduces income inequality. Li, Squire and Zou (1998), and Lundberg and Squire (2003) used the M2 to the GDP ratio as a measure of financial development, likewise finding the inequality-decreasing effect. Hence it can be assumed that financial development reduces income inequality.

The number of studies about the influence of foreign trade on income inequality is not large. According to Richardson (1995), the influence of export and import on income inequality depends on many conditions. An increase in import from developing to developed countries can lower the wages in the competitive field of production of developed countries and, thus, increase inequality in developed countries. Yet, the influence can be different in developing countries or in case of trade between developed countries themselves (Gustafsson ja Johansson, 1997). Xu and Zou (2000) found that income ine-

quality increased with the growth of foreign trade in China in the years 1985–1995. Litwin (1998) got the same result by analysing developing countries. Both studies used the ratio of summarised exports and imports to the GDP as a measure of foreign trade. It makes sense to keep export and import apart here. Gustafsson and Johansson (1997), for example, included import from developing countries into their analysis of OECD countries and it turned out to be an inequality-increasing factor. Li, Squire and Zou (1998) included export into their study of the panel data of 49 developed and developing countries, and it appeared to be an inequality-decreasing factor. Yet, the influences of export and import on income inequality certainly need further analysis.

The influence of foreign investments on income inequality has got even less research attention in the literature. According to Alderson and Nielsen (1999), and Bornschier, Chase-Dunn and Rubinson (1978), it has been mostly found that larger incoming foreign investments tend to increase income inequality. The proposed explanation is an increase in both the elite and low-paid workers. Alderson and Nielsen (1999) analysed the panel data of 108 countries in 1947–1996 and found support to the assertion about the inequality-increasing influence of foreign investments. So, it can be assumed that if incoming foreign investments increase, then income inequality increases, too.

1.6. Summary of the hypothetical factors of income inequality

To sum up, it can be said that in the case of many factors of income inequality there is no agreement in earlier surveys about the character of the influence exerted by a particular factor on income inequality. Both the theoretical assumptions and the results of empirical analyses vary, often ranging from a negative to positive effect, including the possibility of no effect at all. The differences in the results in previous research may be due to the different numbers of other factors included into the

analyses. Moreover, the authors often do not specify whether they are dealing with the direct or total effect of a particular factor on income inequality, but for the sake of correctness, either only the direct effects or only the total effects estimated by different authors can be compared. Table 1 summarises all the factors discussed before and the hypothetical signs of the effects of these factors on income inequality.

It can be pointed out that the effects of a country's wealth and of the development of economic structure on income inequality are assumed to be nonlinear. The technological development, education inequality and foreign investments are supposed to increase and financial development to reduce income inequality. The concentration of land and the abundance of natural resources have also been supposed to increase income inequality, but the more recent studies have questioned this. Cultural variation, shadow economy and corruption are also thought to increase income inequality. However, because of the problems with the data availability, the number of studies addressing these cultural factors is small and so the hypotheses about them are questionnable. The same can be said about the influence of export and import on income inequality. Unfortunately, there is no common indicator to measure the composition of households and therefore the hitherto performed studies cannot be compared. Regarding other factors, there are various hypotheses about their influence on income inequality.

As there is high variance in results about the character of most factors' influence of on income inequality, there is definitely a need for a complex analysis that would include both direct and indirect effects. It is possible that the variance in previous results is at least partly due to mistakes in model specification − omitted factors or omitted influences between factors.

Table 1. The factors of income inequality and the hypotheses about the character of their influence on income inequality[5]

Group	Factor	Hypothesi-sed effect	Comments
Economic development	A country's wealth	?	Non-linear effect, ∩, ∪, insignificant
	Development of economic structure	?	Non-linear effect, ∩, ∪, insignificant
	Economic growth	?	+ , – , insignificant
	Technological development	+	
	Urbanisation	?	+ , – , insignificant
	The share of children in population	?	+ , –
	The share of elderly people in population	?	+ , –
Demographic factors	Composition of households	?	Indicators not comparable, summarising difficult
	Educational level	?	+ , –
	Education inequality	+	
	Education expenditure	?	+ , – , insignificant

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[5] "+" indicates a positive and "–" a negative effect; "∩" indicates a non-linear effect where the influence is positive at first and then becomes negative; "∪" indicates a non-linear effect where the influence is negative at first and then becomes positive; "?" indicates an effect, about the character of which there is no agreement.

Group	Factor	Hypothesi-sed effect	Comments
Political factors	The share of the government sector	?	+ , −
	Democratisation	?	+ , − , insignificant
	Land concentration	+	insignificant in more recent studies
Cultural and environmental factors	Cultural variation	+	few studies
	Shadow economy	+	few studies
	Corruption	+	few studies
	Abundance of natural resources	+	insignificant in more recent studies
Macroeconomic factors	Inflation	?	+ , − , insignificant
	Unemployment	?	+ , − , insignificant
	Financial development	−	
	Export	?	+ , − , few studies
	Import	?	+ , − , few studies
	Foreign investments	+	

2. INFLUENCES BETWEEN THE FACTORS OF INCOME INEQUALITY

As mentioned before, in addition to the direct effect on income inequality, many factors also exert indirect effects on income inequality through other factors. It is possible that one particular factor influences one or more factors, which in their turn affect one or more other factors, and so on. Hence, the possible chains of indirect effects are quite complex and have to be systematised in some way. In this article, the influences between the factors forming chains of indirect effects are discussed separately. The influences are systematised according to the influencing factor. So, by each factor only the possible first links of the chains of indirect effect are considered, the following links are discussed by the next influencing factors, and so on. All the influences between the factors are summarised in Figure 1.

2.1. Influences of economic development

A country's wealth can influence income inequality, for example, through the share of the government sector. It is believed that growth in a country's wealth will lead to a relative increase in the government sector, because higher incomes involve higher readiness to pay taxes and a higher demand for public goods (Cameron, 1978; Singh and Sahni, 1984). This assumption has met with support, for example, in the studies of Cameron (1978) and Boix (2001), both using international data. Another explanation is that redistributive transfers form quite a large proportion of government expenditure. Redistribution can be viewed as a luxury good, the demand for which increases with an increase in incomes (Johnson, 1987). Some authors suppose that economic growth depends on a country's wealth: growth is faster in poorer countries where the backwardness

and, accordingly, opportunities for development are larger (Barro, 1991). This was evidenced by the analysis of Barro (1991) who used the panel data of 98 countries for 1960–1985, and by the study of Swank (1996) who analysed 25 countries in the period 1960–1989. A country's wealth can similarly influence income inequality via education. More affluent countries can afford to spend more per capita GDP on education and the educational level of their population is higher (Tolley and Olson, 1971). A country's wealth can also attract foreign investments. Barrel and Pain (1997), for example, found that larger GDP was associated with larger foreign investments. At last, a country's wealth can also affect income inequality through corruption. Corruption is induced by scarce resources and people's wish to make the distribution of scarce resources work in favour of themselves; consequently, there is a higher corruption risk in poorer countries with higher resource scarcity (Husted, 1999).

Technological development naturally brings about changes and the development of economic structure. Technological development can influence income inequality via a country's wealth and economic growth. After all, technological progress enables more effective use of resources in production and is one of the most important engines of an increase in a country's wealth and faster economic growth. The influence of technological development on unemployment has also been discussed in literature. It is assumed that with the introduction of new technologies some workers become redundant and some firms can get closed down, causing unemployment to increase (Eriksson, 1997). However, these are apparently short-term effects and it would be wrong to say that continuous technological development continuously increases unemployment.

The development of economic structure can affect income inequality through the share of the government sector. The demand for redistribution increases with industrialisation because of a higher probability to become unemployed and the risk of work accidents, which increase the demand for unemployment and health insurance coverage (Boix, 2001; Johnson, 1987). Berry

and Lowery (1984) have analysed U.S. data and have found that a larger share of the industrial sector in the GDP will accordingly raise the share of the government sector in the GDP. Boix (2001) analysed 65 countries in the period 1970–1990 and found that a smaller agricultural sector was related to a larger government sector. Yet, the influence mechanisms related to work accidents may not hold during further development and increase of the service sector. Nevertheless, it can be assumed that technological development will lead to more possibilities in health care and a longer average lifetime, which in its turn will increase expenditures on health care and pensions (Boix, 2001). The development of economic structure also affects the demographic factors of income inequality. If a large share of population moves from the agricultural into the industrial sector, important changes in family planning take place, the birth rate declines and the population ages. This trend appeared, for example, in a study by Schultz (1994) who used the data of 68 low-income countries. In addition, if employment shifts from agriculture to industry, the share of urban population increases, too (Gibbs and Martin, 1962). The changes in economic structure certainly cause some changes in the composition of households (for example, more working women). Unfortunately, this influence has not been widely discussed. Therefore, the composition of households being a very complex factor, no simple assumptions can be made about the influence of economic structure on the composition of households.

2.2. Influences of demographic factors

Next, the influences of demographic factors on other factors of income inequality will be considered. As there are many cultural changes related to urbanisation, including changes in family planning, urbanisation usually lowers the birth rate and the share of children in population (Li and Vaupel, 1989) and leads to ageing of the population. This was confirmed, for example, by a study of Schultz (1994). The age structure of population influences income inequality, for example, through the share of

the government sector. If there are more children and elderly people in population, the expenditures on pensions and subsidies as well as health care are larger. The empirical analysis of Boix (2001) showed that the larger share of children and elderly people in population will increase the share of the government sector in economy. The larger share of children in population also means government's larger expenditure on education (Stijns, 2001b); however, the change in education expenditure per child is not clear.

Larger expenditure on education can be assumed to raise the educational level of population, though this influence can only appear with a certain time lag. The educational level of population influences income inequality through many factors, such as technological development and economic growth. The higher educational level of human capital increases the productivity and technological development. According to Temple (2000), most studies have confirmed that the population's higher educational level leads to faster economic growth. The influence of the educational level on education inequality has also been discussed in literature, but the character of this influence is not clear. Winegarden (1979), for example, found that an increase in the educational level will reduce education inequality. Ram (1990), in his turn, showed that as the overall educational level grows, education inequality will first increase and then will start to go down.. Initially, only a small proportion of the population gets highly educated, while others remain on a low level of education, which means increasing education inequality. Later, more and more people get educated and the distribution of education will become more even again. (Ram, 1990; Cornia and Kiiski, 2001) According to Heliwell (1994), a higher level of education increases the demand for democratisation and, thus, probably increases the level of democratisation. The influence of the educational level on corruption has also been discussed, but according to Ahrend (2002), the influence depends on many factors (e.g., press freedom) and no clear assumption about the character of the influence can be pointed out. At last, the educational level affects income inequality via

foreign investments: as it means also higher quality of human capital, a higher educational level of population attracts foreign investments (Blomström and Kokko, 2003).

2.3. Influences of political factors

The share of the government sector in economy affects income inequality, for example through economic growth. According to the overview by Ram (1986), the size of the government sector is considered both as a growth-increasing and growth-reducing factor. On the one hand, the government sector enhances economic growth, harmonising the social conflicts and protecting against foreign risks. On the other hand, the activity of the government sector is frequently inefficient; regulations and taxes impose excessive burdens on economy and distort economic incentives. Lundberg and Squire (2003) analysed the panel data for 1960–1995 and found that a larger government sector accelerates economic growth, but the significance of this influence is not clear. The influence of the government sector on corruption has also been discussed. It can be assumed that in case of a larger share of the government sector in economy there are relatively more bureaucrats and hence more chances for corruptive behaviour (Husted, 1999). However, the empirical analysis by Husted (1999) showed no significant influence of government sector at all. The share of the government sector can affect income inequality through inflation. Lindbeck (1983), for example, points out the possibility that the larger share of the government sector and a larger tax burden cause a wish to compensate for it by higher gross incomes, which in its turn leads to an overall increase in prices. The influence of the size of the government sector on unemployment is also possible: it can be assumed that a larger government sector also means more stable jobs and lower unemployment. However, Haskel and Szimanski (1993) studied the impact of the share of the private sector on unemployment and found that the influence can be either positive or negative.

Democratisation in its turn can influence income inequality through the share of the government sector in economy. In case of democracy, the government has to comply more with the voters' demand for public goods and redistribution (Boix, 2001). The influence of democratisation on economic growth has been widely discussed in literature, but there is no common view about its character. According to an overview by Sirowy and Inkeles (1990), many authors think that democracy enhances economic growth, because the protection of civil liberties and freedom motivates people to make decisions that are useful for growth. Some authors, on the other hand, believe that democratisation can slow economic growth, because it is simpler to take growth-enhancing political decisions in an authoritarian society. Yet, some authors consider democratisation as an insignificant factor for economic growth. The empirical evidence is contradictory, too. For example, Lindenberg and Devarajan (1993) analysed 93 developing countries in the years 1973–1988 and found that democracy is a growth-enhancing factor. On the other hand, both the analysis by Heliwell (1994) which used the panel data of 125 countries for the years 1960–1985, and the study by Lundberg and Squire (2003) who used the panel data of 38 countries in the years 1960–1985 showed that democracy slows economic growth, but the significance of the influence is doubtful. So, no clear assumptions can be made about how democratisation affects economic growth.

2.4. Influences of cultural and environmental factors

It is difficult to make assumptions about the indirect effect of cultural factors on income inequality. Evidently, many cultural factors do affect economic development (Granato, Inglehart and Leblang, 1996; Swank, 1996). Unfortunately, the influence of cultural variation, which is one factor of income inequality, has not been analysed. Stijns (2001b) analysed 102 countries in the period 1972–1999 and found that cultural heterogeneity reduces

education expenditures, but this possible influence needs further analysis in the future. It can also be assumed that in countries with higher cultural variation education inequality is also higher: different ethno-linguistic groups have different access to education as well as a different attitude to educational attainment (Kao and Thompson, 2003).

The abundance of natural resources affects the development of economic structure. In countries with few natural resources most of the population is probably employed in the service sector instead of sectors using natural resources. In addition, Gylfason (2001) points out that abundance of natural resources can hinder technological development. Abundance of natural resources can influence income inequality also via economic growth. In case of more natural resources there is less need to increase productivity and the economic growth is slower (Sachs and Warner, 1995; Rubinson, 1978). This view is supported by the study of Sachs and Warner (1995) analysing international data for the period 1970–1989 and using the share of exports based on agriculture, minerals and fuels in the GDP as a measure of abundance of natural resources. However, Stijns (2001a) analysed the same period and found that the stocks of minerals and fuels had no effect on economic growth. At last, abundance of natural resources can probably attract foreign investments, too. Unfortunately, the author has found no studies about this possible influence.

2.5. Influences of macroeconomic factors

The influence of inflation on economic growth has got much attention in literature, but there is no common view about it. Some authors believe that inflation destabilises the economy and slows down economic growth; others think that inflation motivates people to invest in production and thus accelerates economic growth. (Bruno and Easterly, 1996) The empirical evidence is contradictory, too. The results of Lundberg and Squire (2003) analysing panel data for 1960–1995 refer to the

growth-accelerating influence of inflation. Gillman, Harris and Matyas (2001) studied a similar period, but found inflation to slow down growth. Inflation can affect income inequality also via export and import. It can be assumed that higher inflation in a particular country decreases the purchasing power and demand for imports, whereas exports into other countries become relatively cheaper causing export to increase. The indirect effect of financial development on income inequality can go through economic growth. Leblang (1996), for example, found that a higher ratio of private credits to the GDP accelerates economic growth. However, this influence needs further analysis.

The indirect effect of foreign trade on income inequality can also involve the share of the government sector in economy. In case of a larger extent of foreign trade the foreign risks become higher. This, in turn, forces the government to increase control to reduce instability and compensate for increased foreign risks with higher social security (Cameron, 1978; Berry and Lowery, 1984; Rodrik, 1998; Boix, 2001). This hypothesis is supported by the study of Cameron (1978), which used a cross-section of 18 countries and showed that countries with a higher ratio of foreign trade to the GDP had a larger share of the government sector in the GDP. Foreign investments probably influence technological development and economic structure. For example, Barrell and Pain (1997) noted that foreign investments enhance technological development, probably because of additional resources available for development and a possibility for imitation. Foreign investments often create additional jobs, and can thus reduce unemployment. The influence of foreign investments on the educational level of population has also been discussed in literature (Blomström and Kokko, 2003). However, this influence mostly consists of training programmes for workers of firms based on foreign capital. Unfortunately, these programmes are likely to have no effect on the indicators usually used for measuring the overall educational level of population. Therefore, the influence of foreign investments on

the population's level of education can be considered insignificant.

2.6. Summary of the hypothetical influences between the factors of income inequality

The influences between the factors of income inequality discussed above are summarised in Figure 1 which covers all the influences considered in literature to date and known to the author of this article. For the sake of simplicity and readability, the figure covers only the factors of income inequality and the influences among themselves. Income inequality and the direct influences of each factor on income inequality presented in Table 1 have been left out. So, to get the whole system of direct and indirect effects of all factors on income inequality, income inequality itself, direct effects of all factors on income inequality, and the last link of each chain of indirect effect have to be imaginarily added to the figure. It has to be mentioned that although Figure 1 includes direct effects of one factor on another factor, the cited studies have mostly not specified, whether a direct or total effect is discussed.

The character of the indirect and total effect of one particular factor on income inequality cannot be predicted on the basis of Figure 2. The problem lies in the fact that the relative size of different influences is not known. The indirect effect can be estimated, if the direct effects of factors on income inequality and all the effects between the factors are also estimated. Then it is possible to summarise all the causal chains to obtain the results about the indirect and total effect of this factor on income inequality. So, the indirect and total effects cannot be predicted without empirical analysis. Most studies published so far have used regression analysis to investigate the effects of different factors on income inequality. Regression analysis, however, excludes the opportunity to take account of the fact that there are causal interrelationships between different income inequality factors themselves. In order to analyse such a

complex system of relations, it is reasonable to use structural equation modelling. This approach enables distinguishing the causal relationship consisting of a direct and indirect effect from the total relationship between income equality and each factor of income inequality. So, it is reasonable to use structural equation modelling when analysing empirically the system of influences discussed in the present article.
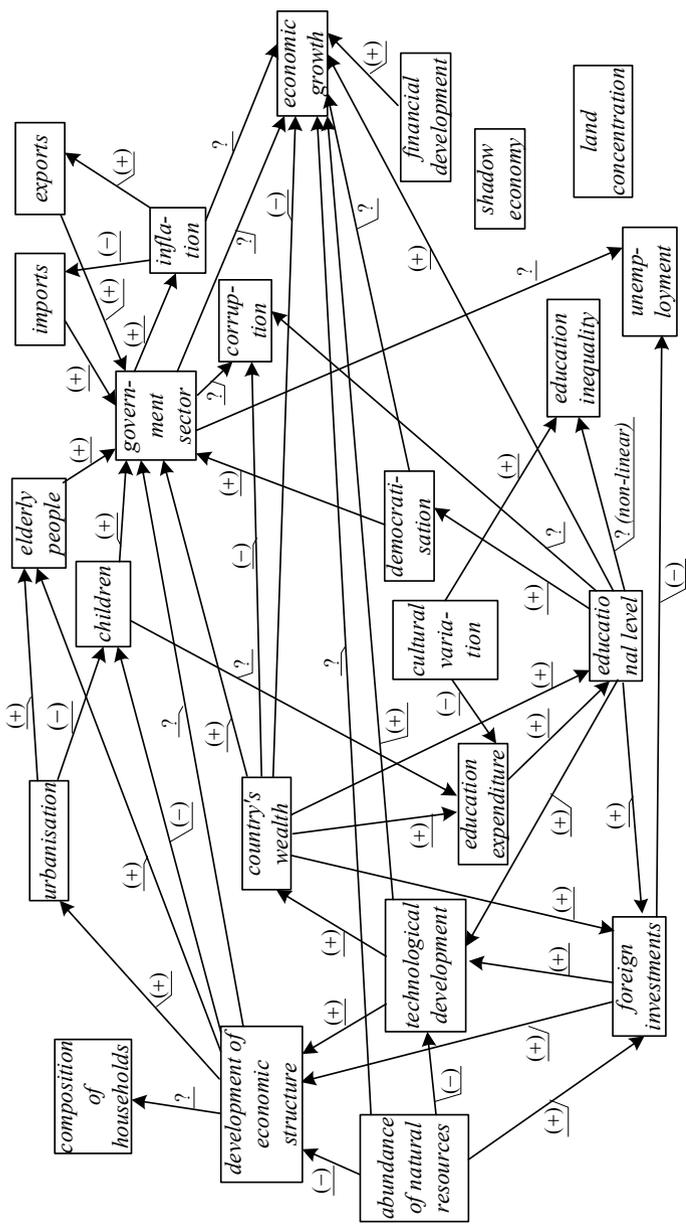
Figure 2. Influences between the factors of income inequality (For the sake of simplicity and readability, the figure covers only the factors of income inequality and the influences between themselves. Income inequality and the direct influences of each factor on income inequality presented in Table 1 are left out.) "+" indicates a positive influence and "–" a negative influence, "?" indicates the influence, about the character of which there is no agreement.

CONCLUSIONS

The motivation of the present article lies in the following concept. When analysing the factors of income inequality, first, as many factors as possible have to be included into the analysis, and second, in addition to the direct effects of these factors on income inequality all the influences between the factors themselves forming the indirect effects of these factors on income inequality have to be included. Then it is possible to estimate the total effect of one particular factor on income inequality as consisting of a direct and indirect effect and not comprising a non-causal relationship between this factor and income inequality.

This article introduces all the factors of income inequality proposed in previous literature as known to the author of this article. 24 factors can be pointed out which can be divided into five categories: economic development, demographic factors, political factors, cultural and environmental factors, and lastly, macroeconomic factors. It can be concluded that in the case of many factors there is no agreement as to whether their effect on income inequality is positive, negative or insignificant. One possible explanation is the differing number of other factors included into the analyses by different authors. Furthermore, often it has not been specified whether the direct or total effect of the particular factor on income inequality is studied.

For correct estimation of the total effects, indirect effects consisting of the possible influences between the factors of income inequality have to be taken into account. In the present article these influences are reviewed, too, ending up with a system of the influences giving an idea about the possible indirect effects of all factors on income inequality discussed in this article. The indirect and total effects, however, can be estimated only by means of empirical analysis, because the relative size of different influences is not known. As regards the

empirical analysis in the future, it is reasonable to use structural equation modelling as regression analysis does not include the causal interrelationships between different income inequality factors themselves.

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KOKKUVÕTE

Sissetulekute ebavõrdsuse mõjurid ja nende mõjumehhanismid: teoreetiline ülevaade

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tulekute ebavõrdsusele võimalik hinnata ainult empiirilise ana-
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modelleerimist.