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**The long term impact of microfinance on income,  
wages and the sectoral distribution of economic activity**

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## ***Abstract***

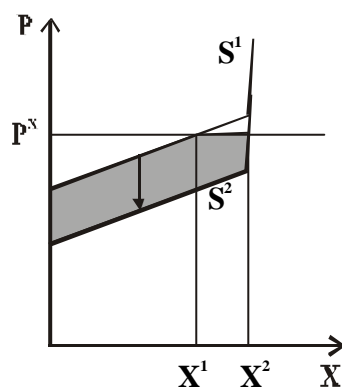
*This paper analyses the long-term effects of improved small-scale lending, often provided by microfinance institutions set up with the support of development aid. The analysis shows that some common assumptions about microfinance are not true at all: First, it shows that the impact on income will accrue not to the microenterprises themselves, but rather to the consumers of their products. Second, microfinance will have a significant positive effect on the wage levels of employees in the informal sector. Third, microfinance will cause high growth rates in the informal production sector, whereas the trade sector will either contract or at best grow very little.*

## Introduction

This paper analyses the long-term effects of improved small-scale lending, often provided by microfinance institutions set up with the support of development aid. The analysis shows that some common assumptions about microfinance are not true at all: First, it shows that the impact on income will accrue not to the microenterprises themselves, but rather to the consumers of their products. Second, microfinance will have a significant positive effect on the wage levels of employees in the informal sector. Third, microfinance will cause high growth rates in the informal production sector, whereas the trade sector will either contract or at best grow very little.

### 1. Income-related effects

This section examines the income-related effects of small loan programmes. Unfortunately, conventional impact analyses are limited to an investigation of the ways in which small-scale lending programmes *directly* affect borrowers' incomes.<sup>1</sup> These direct effects comprise, on the one hand, the interest rate differential between the programmes' loans and alternative sources of financing, and, on the other, the additional profits that entrepreneurs are able to make because they have been able to expand their businesses by using the borrowed funds. The effects captured by this traditional approach are depicted in Figure 1. Access to inexpensive loans causes the cost or supply function of an enterprise to shift downward from  $S_1$  to  $S_2$ , so that the profit per unit produced and the supply increase simultaneously. The increase in the producer's surplus accruing to the owner of the enterprise is represented by the area shaded in grey.



**Fig. 1: The direct income-related effects of small loans**

The extent to which a small loan programme contributes to combating poverty (measured in US\$) is then determined by multiplying the average increase in the borrowers' income (in US\$) by the number of borrowers and the percentage of borrowers who are poor. If, for

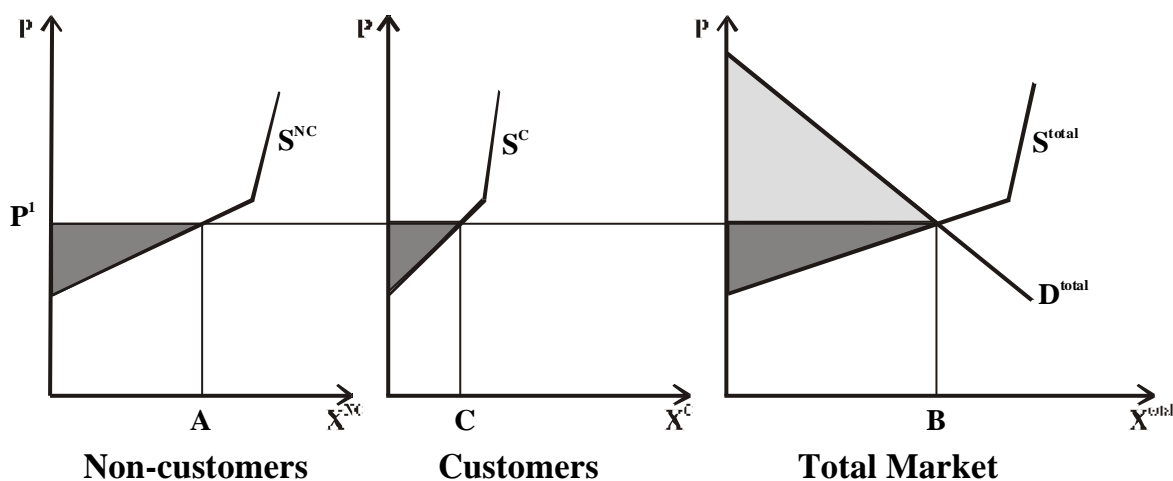
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<sup>1</sup> For an overview on impact analyses of microfinance see BOLNIK/NELSON, 1990, S. 299-301. Also cf.: US-AID, 1973, WOLRD BANK, 1976, PAGE et al., 1977, DAVID/MEYER, 1979, RAO, 1980, HUNT, 1983, TENDLER, 1983, FEDER/SLADE, 1985. Concerning the methodologies of impact analyses cf.: DAI, 1981, BROWN et al., 1978, BROWN, 1984, BAINES, 1979, as well as CASLEY/LURY, 1982 and 1988.

example, a small loan programme causes the income of its customers to increase by US\$ 10 per month on average, and 60% of a total of 10,000 borrowers are poor, the programme's contribution to the alleviation of poverty would be US\$ 10 \* 10,000 \* 60% = US\$ 60,000/month.<sup>2</sup> However, this will only prove to be an accurate method of gauging the income-related effects of such a programme if its outreach is quite limited, i.e. if the group of borrowers it serves does not represent a significant share of the overall group of small entrepreneurs. Otherwise, the effects on the market induced by the cost reductions which are made possible by the availability of inexpensive loans must also be taken into consideration; likewise, one must also take into account the effects on the incomes of competitors who did not receive credit, as well as the effects on the incomes of consumers.

In analysing the income-related effects of small loan programmes for all market participants, first, the situation prior to the introduction of small-scale lending is described, then the situation assuming a low level of market penetration, and finally the situation assuming a higher degree of market penetration. In the following, it is assumed that the cost and supply functions of borrowing enterprises are not significantly different from those of enterprises that do not receive credit.

Figure 2 shows the situation prior to the receipt of loans; here, a distinction has already been made between future customers and non-customers of small loan programmes, i.e. future borrowers and non-borrowers. It is assumed that one-third of the enterprises will eventually have access to credit. Because there are fewer potential customers than non-customers, the supply function of the future customers is steeper than that of the non-customers, although the elasticity of supply is the same for all enterprises.

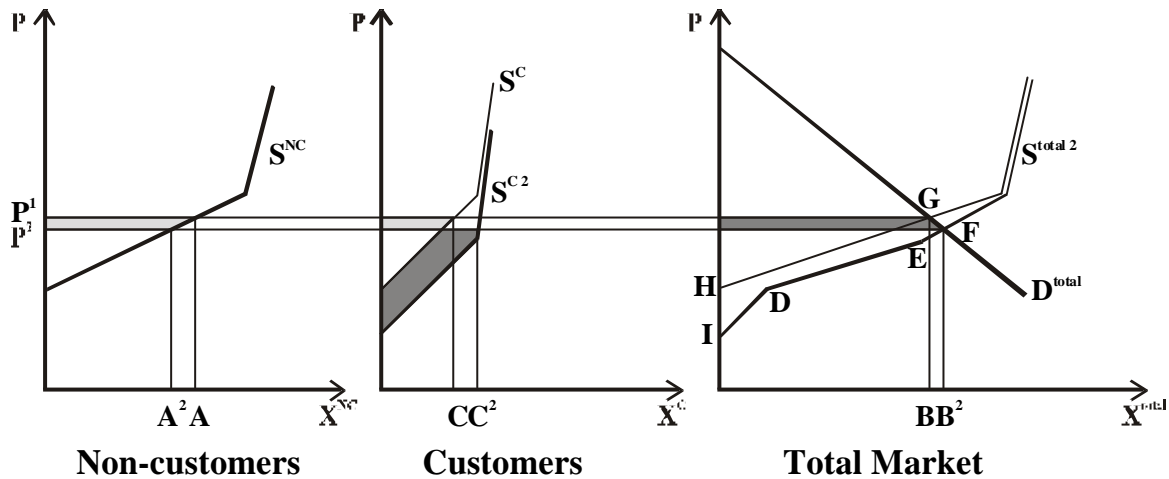


**Fig. 2: The situation prior to the introduction of small loans**

The supply functions of the two groups – future non-customers ( $S^{NC}$ ) and future customers ( $S^C$ ) – aggregate in the overall market to form total supply function  $S^{total}$ , for which, given demand of  $D^{total}$ , price  $P^1$  emerges. The producer's surplus, both for the respective groups of entrepreneurs and for the enterprise sector as a whole, corresponds to the area shaded in dark grey. The consumer surplus is represented by the light-grey area.

<sup>2</sup> Cf. HULME/MOSLEY, 1996, pp. 182–5.

Customers now receive loans that are cheaper than those previously available to them in the informal credit market; as a result, their supply function shifts downward (see Figure 3). They will thus expand their output from  $C$  to  $C^2$  and operate at their capacity limit. In the market as a whole, this gives rise to a new supply function,  $S^{\text{total } 2}$ ; consequently, the quantity sold increases to  $B^2$ , while the price decreases to  $P^2$ .



**Fig. 3: The effects of lending to a small portion of existing enterprises**

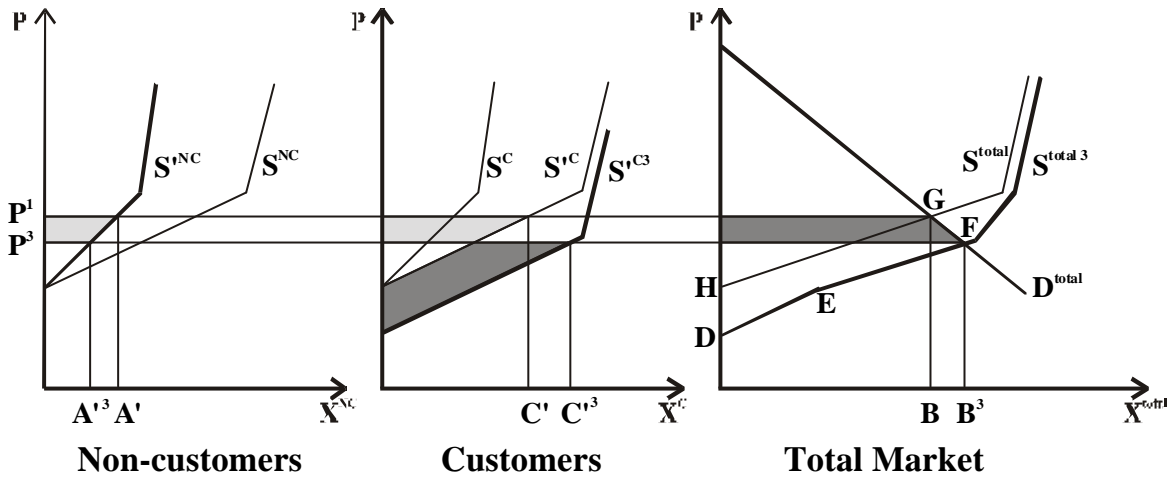
The increase in surpluses that is induced by the introduction of small-scale lending corresponds to the dark-grey areas; the decrease in surpluses is represented by the areas shaded in light grey. Thus, on the producers' side, non-customers must accept a decrease in the surplus that accrues to them, while the producer's surplus that accrues to customers increases by an amount that corresponds to the difference between the dark and light-grey areas. The consumer surplus also increases. The total increase in the surpluses accruing to producers and consumers corresponds to the area DEFGHI, and is clearly larger than the increase in the consumer surplus. Thus, the income of the producers as a group increases, although at the same time there is also a redistribution of income within this group from non-customers to the customers of the small-scale lending institutions.

If the scope of lending activities is now extended, an expanding share of producers will have access to inexpensive loans. Figure 4 depicts a situation in which two-thirds of producers receive credit.

In analysing the diagram, we must first of all bear in mind that the group of customers is larger. Consequently, the supply function of this group would have been longer and flatter than it was before any enterprises received credit, and would have corresponded to the function  $S^C$ . The opposite is true for non-customers, whose supply function,  $S^{\text{NC}}$ , would have been shorter and sloped upward more sharply.

In the market as a whole, the supply functions  $S^{\text{NC}}$  and  $S^{\text{C}3}$  now aggregate to form total supply function  $S^{\text{total } 3}$ , causing the supply to increase to  $B^3$  while the price falls to  $P^3$ . The increase in the surpluses accruing to producers and consumers, as compared with the situation prior to the introduction of the credit programme, is represented by the areas shaded in dark grey, while the decrease in surpluses accruing to producers corresponds to the light-grey area. The overall increase in the surpluses is represented by the area DEFGH, which in turn is larger than the increase in the consumer surplus. Therefore, producers as a group also benefit in this case. At the same time, there is a relatively large redistribution of income from non-

customers to customers of the credit programmes (the producer's surplus accruing to non-customers decreases by more than half).



**Fig. 4: Effects of lending to the majority of existing enterprises**

Depending on the price elasticities of supply and demand, it is also possible that the consolidated group of microenterprises suffers an income loss. In this case, the customers of the credit programmes will still have increased their income, but not by as much as the income of the non-customers has fallen. In this case too, the true beneficiaries of microfinance would be the consumers, who would reap the benefit of reduced prices in the informal enterprise sector.

As long as the consumers served by the informal enterprises are also poor, this would still mean that microfinance helps to alleviate poverty: As shown, the combined effects on consumers' and producers' surpluses are always positive. However, if the consumers, or at least a significant percentage of them, are not poor, microfinance would not benefit the poor much.

## 2. Impacts on the labour market and the sectoral distribution of enterprises

The impact of small-scale lending is a matter of debate in development policy circles. The concern is often voiced that increasing the availability of small loans merely causes the (unproductive) trade sector to expand. Underlying this concern is the tacit assumption that an improvement in the income of the poor who work in the trade sector would not enhance the welfare of the society as a whole. Without exploring whether such a position is even tenable, this section will demonstrate that the point is irrelevant in any case because efficient small-scale lending in fact leads to a disproportionate expansion of the informal production sector.

In the following, the impact of small scale lending on both the labour market, i.e. wage levels in the informal sector, and the sectoral distribution of economic activity, is analysed. The point of departure is a situation characterised by a segmented credit market, i.e. one in which there is no supply of small-scale lending programmes, and therefore small enterprises finance a portion of their "total assets" by taking out informal loans at very high interest rates. If they are to be able to afford these loans, such enterprises must achieve a very high ROI; this in turn

forces them to employ relatively labour-intensive production methods, and thus their labour productivity remains low. Consequently, wage levels are also low.

By contrast, large enterprises<sup>3</sup> can finance their operations quite inexpensively. Accordingly, their operations are capital-intensive, which leads to high labour productivity and high wages.<sup>4</sup>

Thus, besides the credit market, also the labour market is divided into two segments. Employees of large enterprises earn relatively high wages, whereas wages are low at small businesses. This is not an outgrowth of official restrictions or requirements, but rather a result of market processes taking place under perfect competition! A segmented credit market thus gives rise to segmentation not only of the size distribution of enterprises, but of labour markets as well.

Figure 5 illustrates the segmentation of credit and labour markets as depicted by the HECKSCHER-OHLIN model. In contrast to the conventional representations, this model employs not two, but three sectors in order to describe more accurately the complex reality of these markets. In industrial sector 1 ( $I^1$ ), “tradable good 1” is manufactured using a linear-limitational production process.<sup>5</sup>  $I^1$  is the unit-value isoquant which represents the various factor combinations that would enable good 1 to be produced in a quantity which has a value of US\$ 1.

Analogously, isoquant  $I^2$  describes the possible combinations that could be used in the production of good 2, with a moderate factor substitution elasticity being assumed. In the third sector, isoquant NT plots the possible combinations that could be used in the production of non-tradable goods.

The price ratios must be such that the factor price lines – i.e. the factor combinations which result in costs of US\$ 1 – are just barely tangent to the isoquants. Given the positions of the isoquants in the diagram, there is not a single line which would fulfil this condition. This is not surprising, for we have already explained that factor prices must be different for small and large enterprises.

The segmentation of the credit and labour markets is shown in Figure 5. Here, the line running through points A and B represents factor prices for large enterprises, i.e. enterprises with high wage levels and low capital costs, while the line running through points C and D represents factor prices for small enterprises. Because the cost of capital is high for small enterprises, their operations are relatively labour-intensive. This explains, on the one hand, why they are the sole suppliers in the labour-intensive non-tradable goods sector and, on the other, why they produce industrial good 2, which is also manufactured by large enterprises, using a comparatively labour-intensive technology (point C).

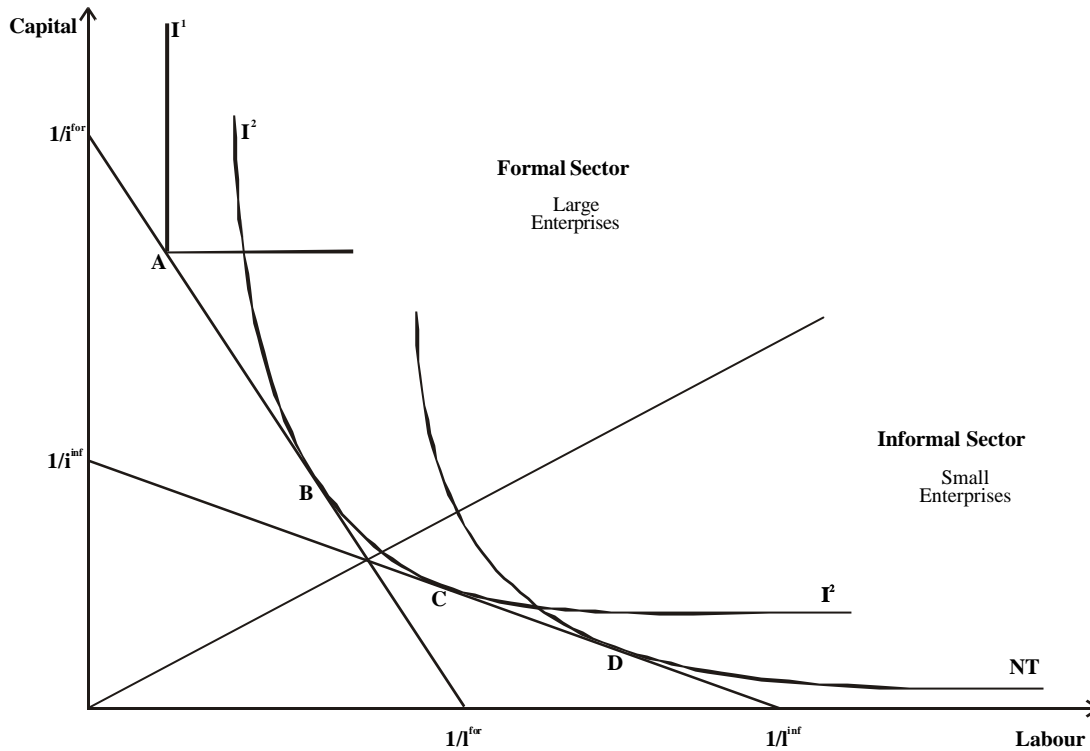
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<sup>3</sup> “Large enterprises” are used as a synonym for enterprises with access to formal bank credit, which is conditional on a certain minimum loan size (see Tschach, 2000) and on formal registration.

<sup>4</sup> For an explanation why wages in the formal sector are not reduced to informal sector wage rates see Tschach, 2000 and Tschach, 2002.

<sup>5</sup> Limitationality is not a central assumption, but rather an approximation of reality. There would be no qualitative change in the correlations derived below if the elasticity of factor substitution were greater.





**Fig. 5: Segmented factor markets as explained by the Heckscher-Ohlin model**

At the same time, because the operations of large enterprises are capital intensive, they are the only suppliers in capital-intensive sector 1. They are also active in sector 2 alongside the informal small enterprises; however, even in this sector their operations are relatively capital intensive (point B). The term “capital intensive” is used to contrast their mode of production with that of small enterprises within the same economy, not with ways of producing goods that are typically employed in other economies.

If we are to investigate the effects of small loan programmes on the sectoral distribution of enterprises, we must first formulate various assumptions regarding the development of factor and goods prices. The following analysis is limited to the assumption that product markets *and* the markets for capital have been liberalised extensively, i.e. that the economy is open. The funding rates in the formal financial sector in a given country are determined by international interest rates in conjunction with the country risk, and thus they will not change even if the demand for credit on the part of the informal sector increases, as this demand will be completely satisfied by additional capital imports. The prices of tradable goods also remain constant, i.e. the additional output generated in the informal industrial sector can either be sold abroad or be used to substitute certain formal-sector products on domestic markets, while the formal-sector goods thus “displaced” by informal products can easily be sold abroad.

Assuming that the increased availability of small-scale loans does not affect the formal sector, we will now examine the ways in which the expanded availability of capital impacts the development of informal industrial sector 2 and the non-tradable sector. The analysis will begin by discussing several theoretical aspects, which will then be illustrated graphically.

The direct effect of an increase in the supply of capital to the informal sector in the form of small loans is that the interest rates paid by informal enterprises will decline. The changes in demand in the two segments of the informal sector will be a function of interest rate elasticity. In comparison with trade enterprises, production enterprises operate at a higher level of

capital intensity; in addition, their rate of capital turnover is far lower than that of trade enterprises. These two characteristics make their costs much more sensitive to changes in interest rates than those of trade enterprises. Thus, an increase of one percent in the interest rate, for example, will raise the costs of a production operation far more than those of a trade enterprise. In other words, the output, and hence the credit demand, of production enterprises is more interest rate elastic than that of trade enterprises. If interest rates are high, there will be only a few industrial enterprises, and they will in turn have a relatively low output. By contrast, lower interest rates will, over the **long term**, result in a disproportionate expansion of output on the part of industrial enterprises.

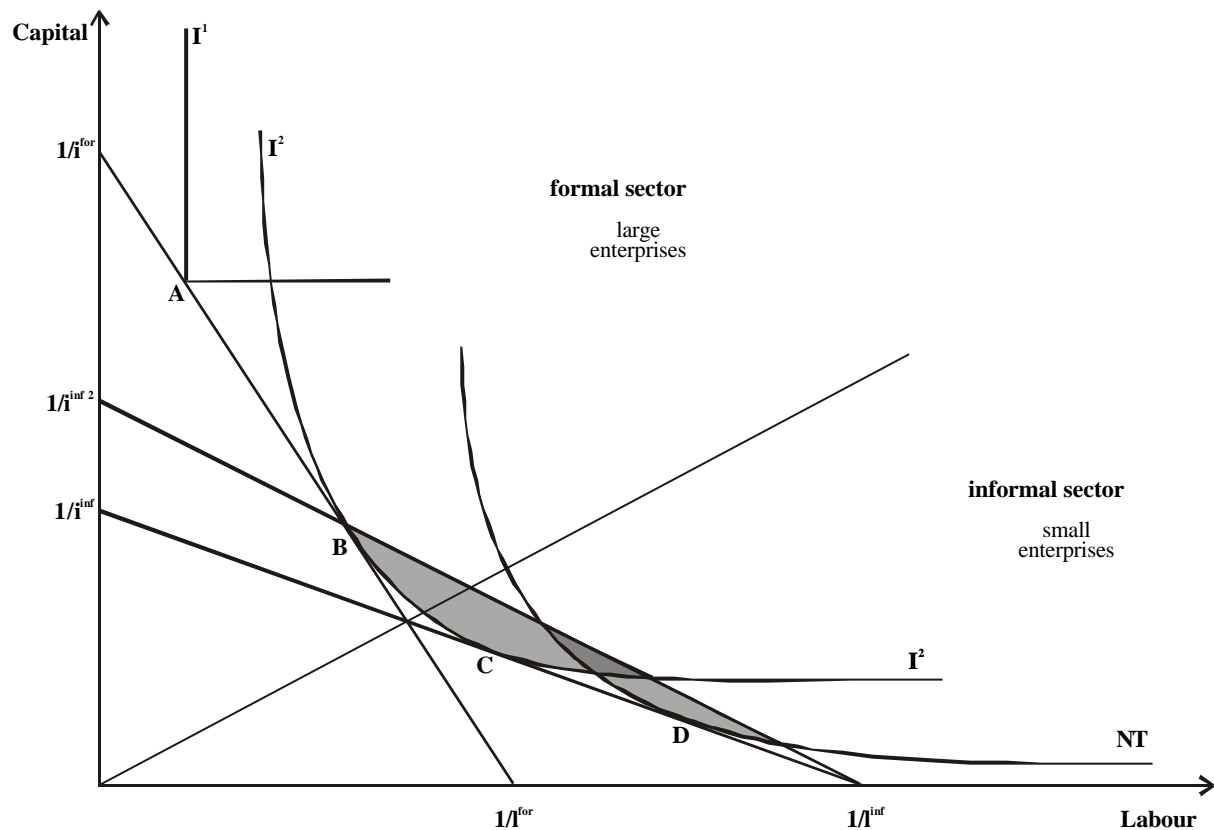
Over the **short term**, the significant decrease in the cost of capital will initially cause the profits of production enterprises to rise dramatically. In planning for the **medium term**, these enterprises will strive to boost their output, which is a realistic goal for them because their increased profits will enable them, on the one hand, to increase their equity capital, and, on the other, to finance additional projects (at least in part) with relatively inexpensive external capital. Thus, existing businesses will grow substantially. Moreover, entrepreneurs in the trade sector will attempt to move into the production sector, which will have become a more attractive market than trade, provided that the additional know-how required to do so is not so substantial as to act as a market entry barrier. In other words, the number of production enterprises will increase.

Changes in product prices are a function of both the nature and size of the markets on which enterprises can sell their products and the elasticity of demand. The output of the production sector is tradable, and depending on their quality, the products involved can also be sold on international markets. The larger the potential sales market, the less pronounced the change in price will be. Indeed, the prices of goods which can be sold on international markets should not be affected at all. It was assumed above that far-reaching liberalisation measures have substantially reduced trade barriers; as a result of these liberalisation measures, industrial good 2 can be sold abroad, and its price will be determined exogenously in the world market. The option of selling industrial good 2 in other countries keeps the prices of informally produced goods from falling even if they are not of sufficient quality to be traded on the world market, provided they can substitute formal industrial good 2 in the domestic market.

Assuming that price effects remain very limited, the increased availability of capital will cause labour productivity – and thus, over the long term, the wage rate – to rise. It is impossible to arrive at conclusions regarding the changes in the non-tradable goods sector for two reasons: labour migrates to the production sector, but at the same time the substantial capital expansion in the production sector does not automatically rule out an increase in the supply of capital available to the trade sector. In other words, there will be an increase in the availability of capital in both sectors. As capital was previously quite scarce in the trade sector, even a small increase in the capital supply is more than enough to compensate for the migration of labour from trade to production.

This line of reasoning will now be illustrated with the help of several diagrams. The first diagram, Figure 6, shows the short term effects of cheaper financing options available to informal enterprises. If we depict these effects on the basis of the Heckscher-Ohlin model, the factor price line for the informal sector rotates upward; i.e. the costs of producing one unit of output (US\$ 1) decrease, enabling the enterprise to earn additional profits. It is clear that the

profits of production enterprises will increase to a greater extent than those of trade enterprises (areas shaded in grey).



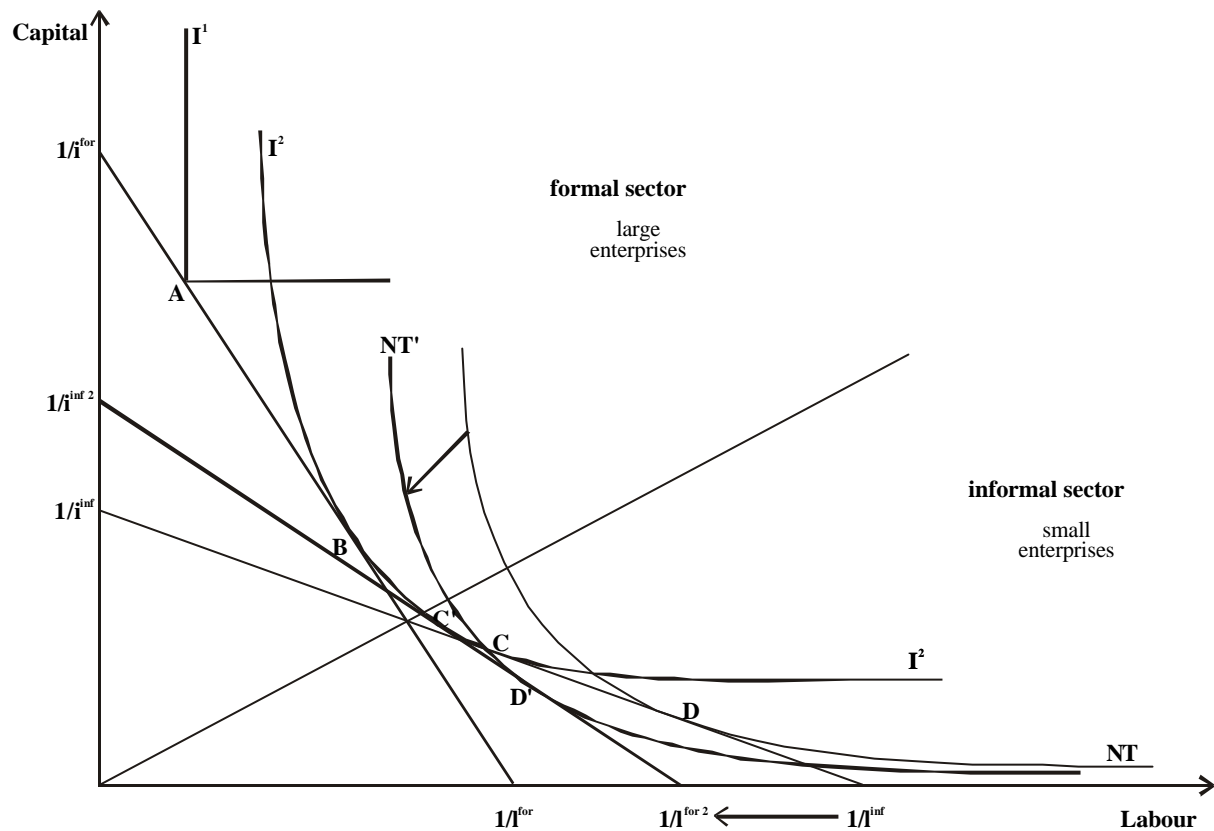
**Fig. 6: The short-term effects of lower lending rates**

The opportunity to earn higher profits will induce enterprises to expand their output. However, an increase in production requires, among other things, additional workers, who must be recruited from other enterprises. As enterprises compete for labour, wage rates in the informal sector will increase until output has expanded to the point where further growth will not result in additional profits.<sup>6</sup>

Figure 7 depicts the new state of equilibrium. If we assume that the goods produced by industrial sector 2 can be traded on international markets, and that, as a result, an increase in output will not cause the price of these products to decrease, informal wage rates will rise to a level of  $f^{or2}$ , i.e. the factor price line rotates downward until it is just barely touching the isoquant for industrial sector 2. Because there is no longer a point of intersection or tangency between the factor price line and the  $NT$  isoquant, enterprises in the non-tradable sector will invariably incur losses if prices remain constant. However, we have already demonstrated that a number of entrepreneurs in this sector would migrate to industrial sector 2, where they can earn greater profits. Thus, the supply of non-tradable goods will continue to contract (at least in relative terms) until the prices in this sector have increased sufficiently to cause the isoquant to shift (downwards and to the left) toward the origin until it reaches the position

<sup>6</sup> This statement is based on the assumption that the informal sector employs all workers who are unable to find employment in the formal sector; i.e. that there is no reservoir of unemployed workers.

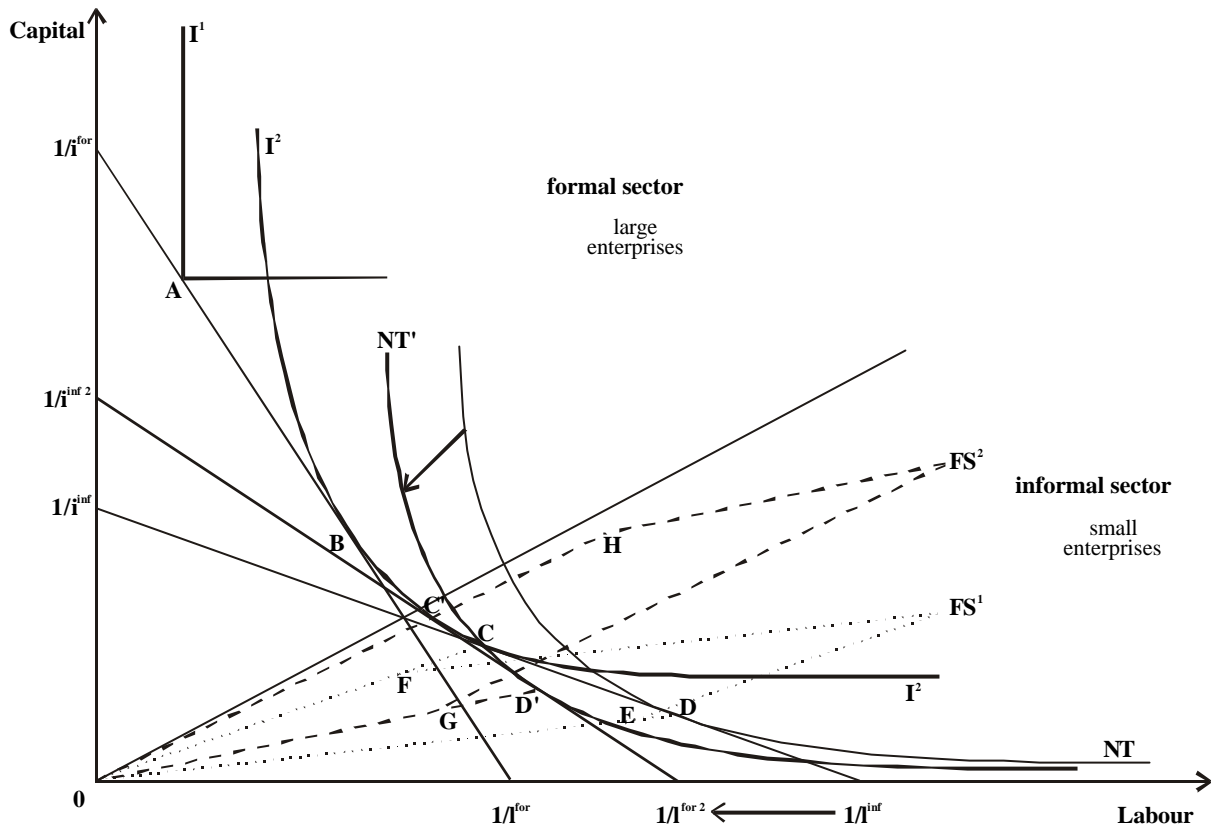
designated by  $NT'$ . Therefore, in the new state of equilibrium, the wage level in the informal sector will increase, as will the prices of non-tradable goods and services.



**Fig. 7: Changes in factor and product prices given lower lending rates**

How do the inflow of capital and lower interest rates alter the sectoral distribution of economic activity in the informal sector? We will assess these impacts on the basis of the RYBCZYNSKI theorem. Figure 8 shows the distribution of factors between the two segments of the informal sector, both before and after the supply of capital has expanded. Before the supply of capital increases, and before interest rates drop, non-tradable goods are produced with combinations of factors that correspond to the dotted line  $OD$ ; industrial goods 2 are produced with factor combinations that correspond to line  $OC$ .  $FS^1$  represents the total stock of factors available to the informal sector; informal industrial sector 2 uses the factors represented by line  $OF$ , while non-tradable goods are produced using the factors represented by  $OE$ .

Once the supply of capital has been increased and interest rates have declined, production in both sectors becomes more capital-intensive, and factor input intensities correspond to the slopes of the broken lines  $OD'$  and  $OC'$ . The inflow of capital has increased the factor supply to  $FS^2$ . If factors are distributed efficiently, then industrial sector 2 will now have access to a quantity of factors represented by  $OH$ ; in other words, the quantity of both labour and capital available to this sector will increase substantially. At the same time, the volume of factors available for the production of non-tradable goods drops to  $OG$  – i.e. output in this sector decreases.



**Fig. 8: Shifts in the sectoral distribution of enterprises resulting from an increased supply of capital and a reduction in interest rates**

### 3. Conclusions

If one takes into account the indirect effects of small scale lending, i.e. the effects on the level of output of the customers of microfinance institutions, and therefore on the market prices of their products, “microenterprises” as a group do not benefit as much as the measurement of direct income effects suggests. Indeed, depending on the price elasticities of supply and demand, the non-customers might even suffer income losses larger than the income gains accruing to the customers of microfinance institutions. The main beneficiaries of microfinance programmes are therefore not the microenterprises themselves, but their clients, i.e. the consumers of their products.

The second group of beneficiaries are the employees of the informal sector. In the long run, microfinance programmes will, through lower interest rates, increase the capital intensity of production. This increases labour productivity and informal wages. By increasing the wage level of informal employees, i.e. the poorest of the poor, microfinance has a strong, although indirect, impact on poverty alleviation.

The concern that microfinance only gives rise to growth in the non-tradable sector, especially traders, is irrelevant in the long run. Since the interest rate elasticity of demand for credit is much higher in the production sector, this sector will benefit most from microfinance programmes’ lowering the market interest rate. The production sector will grow much more than the non-tradable (or trade) sector, which might, in the long run, even experience a decline in output.

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