

# Income Inequality: Does FDI Matter?



A thesis written as completion of the Master program; International Economics and Business Studies, at the Erasmus School of Economics, Rotterdam.

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# Abstract

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This paper combines two strains of literature - the literature on foreign direct investment (FDI) spillover effects and the income inequality literature - to find out if FDI inflows are among the determinants of income inequality. It explains the different FDI spillover effects, the general causes of changes in income inequality and elaborates upon two hypotheses in which these strains of literature are integrated.

Using OLS regressions, this study confirms that FDI spillover effects have a positive influence on income inequality. No changes to this conclusion are found, when only developing countries are tested. This makes it possible, to add this study to a great number of papers that call for more FDI inflows into poor countries in the fight against poverty. Testing whether the positive influence of FDI inflows on income inequality changes if countries are open to trade, leads to the conclusion that the positive effect in this case almost doubles. This study, therefore, advises that governments do not only try to attract more FDI inflows but at the same time should introduce policies to stimulate trade in general.

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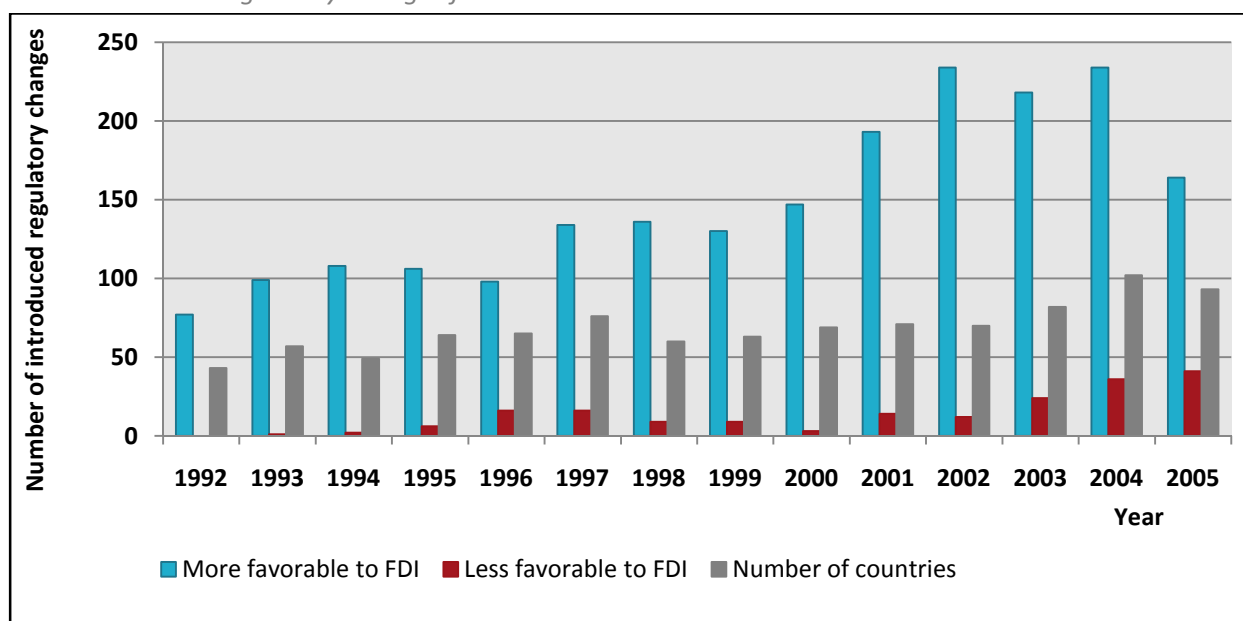
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# 1 Introduction

Governments often promote inward foreign direct investments (FDI) to encourage the development of positive side effects caused by the inflow of new capital, technology and know-how (Brewer and Young, 1997). Such regulatory changes are mainly in the form of newly implemented policies, for example, partial or complete exemptions of corporate taxes and import duties which are only available for foreign corporations<sup>2</sup>.

Table 1 below shows an overview of the annual sum of introduced regulatory changes regarding the inflow of FDI. In total, 92 per cent of all regulatory changes made within these countries are more favorable towards FDI inflows (UNCTAD, 2006). But are these governments justified by implementing such policies to attract more foreign investors? In other words: Do these regulatory changes result in a better welfare for the entire population?

Table 1: National regulatory changes from 1992 until 2005.



Source: UNCTAD, database on national laws and regulations.<sup>3</sup>

<sup>2</sup> See UNCTAD (2006) and Brewer and Young (1997) for more definitions of various FDI incentives.

<sup>3</sup> More favorable towards FDI includes further liberalization, or changes aimed at strengthening market functioning, as well as increased incentives. Less favorable towards FDI includes changes aimed at increasing control, as well as reducing incentives.

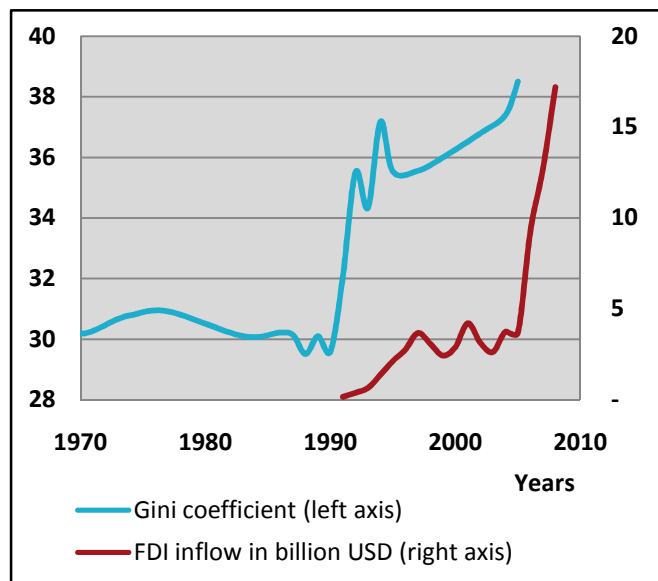
India, which is estimated to have the world's largest population by 2050 (PRB, 2008)<sup>4</sup>, has already set two recent national records. Both the total FDI inflows, over 2006, and the Indian level of income inequality, over 2004, have never been so high<sup>5</sup>.

Although India's income inequality is still respectively low<sup>6</sup>, the trend depicted in figure 1 shows a rapid worsening inequality which started in the year 1990. Are countries like India residing in a state of development as predicted by the famous Kuznets (1955) curve? Or is there indeed a systematic relationship between increased FDI inflows and the continues deterioration of income inequality?

To find out what the implications are for the inhabitants of countries like India and to verify if governments are justified when implementing regulatory changes in order to attract FDI, this paper is aimed at finding a relationship between FDI inflows, their side effects and its relation towards income inequality.

The organization of this paper is the following; firstly two strains of literature are discussed, the literature on FDI spillover effects, described in chapter two, and the literature on within country income inequality, which is described in chapter three. Chapter four will integrate both strains into two hypotheses which each elaborate the within country income inequality and the influence of FDI inflows from two different perspectives. Chapter five describes the data and the followed strategy of the conducted regression estimations of which the results and explanations can be read in chapter six. At last provides chapter seven the conclusions followed by some remarks.

Figure 1: FDI inflows vs GINI in India



Source: Reserve Bank India (2007) and World Bank data

<sup>4</sup> As estimated by the Population Reference Bureau (2008) but with the remark that this will only hold as long as China holds on to its "one child" policy.

<sup>5</sup> Most recent figures (as depicted in figure 1). FDI inflow as reported by the Reserve Bank India (2007). Income inequality is measured by the GINI coefficient taken from World Bank data (WDI Online; see appendix A1, table 7 for more details).

<sup>6</sup> Using the latest figures as reported by the World Development Report (2008) India's record GINI only differs slightly from the world's mean.

## 2 FDI spillovers

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The possibility of getting access to modern technology is perhaps the most important beneficial side effect of countries that wish to attract foreign investments (Blomström and Kokko, 1996). By inviting multinational enterprises (MNE's), host countries may get access to technologies that they cannot produce themselves. Foreign direct investment can also lead to indirect productivity gains for host country firms through the realization of external economies (Barrios and Strobl, 2002). Generally these benefits are referred to as spillovers, which indicates the importance of the way in which the influence is transmitted.

The following five paragraphs will each describe one of the five main channels through which technology spillovers may occur (Blomström, 1991; Blomström et al., 1999; Lipsey, 2002; Sinani and Meyer, 2004). These five spillover channels are;

1. *Demonstration and imitation*
2. *Exports*
3. *Labour mobility*
4. *Competition*
5. *Backward and forward linkages*

### 2.1 Demonstration and imitation

The phenomenon of learning by someone else's experience has long been observed by economists (Johnson, 1985). Annually trillions are invested by companies worldwide in research and development just to outrun the competition (World Bank data<sup>7</sup>). For the competition that cannot afford high spending on research and development, copying might be the only way to keep up. International patent laws protect new innovations from "copycats", this is made possible because a new product has certain features that distinguish it from other already existing products (Moser, 2003). For any product or even

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<sup>7</sup> World Bank data (WDI Online) on research and development expenditure shows that in the period 1995 until 2005 annually over 15,0E15 in constant US\$ is being spend on research and development worldwide. Due to missing values in the World Bank's data this number only includes a median of 76 country observations per year. This makes it reasonable to assume that the real figure is even substantially higher.



a complete production process, with little features to distinguish itself from the competition, it is not possible to claim a right of ownership unless it is brand new. Therefore, not surprisingly, this copycat behavior is found to be the most evident spillover channel of all (Jaffe, 1986).

Many factors within a host country may contribute to sub-optimal levels of investment in learning. Wang and Blomström (1992) find high real interest rates, especially important for less developed countries, and externalities in learning investment as possible factors. The domestic firm faces a trade-off decision between its present, lower, but steady profit. Or, the domestic firm could take the risk to invest in new technology, hoping that the newly acquired knowledge or machinery will result in higher profits in the future.

When a MNE successfully “demonstrates” the use of such a new technology it will encourage domestic firms to adopt it since this substantially lowers the risk of investment (Greenaway et al., 2004). It is obvious that the level of similarity between the manufactured products of the MNE and the domestic firm also determines the size of the effect it has on the domestic firm (Barrios and Strobl, 2002).

The higher the relevance between the MNE and the domestic firm, the more straightforward it is to copy the firms activities. Once a domestic firm has adapted or modified a new technology to fit domestic conditions, it will be easier and cheaper for other domestic firms to do the same. Although it seems intuitive, Kokko et al. (2001) showed that this effect will be larger the more the domestic firm is capable of absorbing the MNE’s activities. They also found that MNE’s change their strategy depending on the type of trade regime within the host country which has consequences for potential copycats.

If a trade regime is import substituting, the MNE established at that time will focus on competing on the local market. In order to succeed the MNE will require an advantage over the local competition. This is mostly a form of technology taken from the home country which is not owned by the competition. In this case, the competition can profit from the spillovers of the new technology used by the MNE. However, if the trade regime is more outward oriented instead, a settled MNE will turn its focus and depend on their international marketing skills and international distribution networks. The obvious downside is that the technology spillovers are very limited in this case, making it harder for the local firms to compete with the MNE (Kokko et al., 2001).

## 2.2 Exports

Several studies have highlighted the positive impact of MNE's on the export capacity of the domestic firms within the host economy (Aitken et al., 1999; Kokko et al., 2001). The downside of outward oriented trade regimes, no available technology spillovers, is being replaced by the opportunity that appears to domestic exporting firms which are now able to learn from the more advanced exporting processes of the MNE.

Greenaway et al. (2004) reasons that domestic firms may be able to benefit indirectly from the presence of an MNE, hereby increasing their own productivity level. Their key point is that exporting involves fixed costs associated with developing new markets and in order to cover those fixed costs, productivity has to be higher to enable the firm to enter. Thus, more productive firms self-select into export markets. Once there, imitation effects or competition effects might lead them to become even more productive. This means that MNE's, with consequent entry to export markets, can set the example for domestic firms. By learning from their example, or by collaborating with the MNE, the domestic firm could open up a potential route for productivity growth. Hereby reducing costs of entry to a foreign market via export spillovers, rather than direct efficiency spillovers mentioned in paragraph 2.1. In this argument it also holds that it is favorable to other domestic firms, considering the demonstration effect, if one has succeeded in realizing export growth.

## 2.3 Labour mobility

Technological spillovers originated from FDI inflows can also be transferred by labourers. Fosfuri (2001) concludes that MNE's could transfer its superior technology to its foreign affiliate only after having trained a local labourer. Once the training has been completed, the same labourer could be hired by other domestic firms or start its own business. In both cases this will lead to technology transfers which in turn will be used in favor of the domestic firms.

In case such spillovers do not take place at that time it could still have other effects on the host country. The first effect is a positive welfare effect due to the higher wages provided by the MNE for trained local labourers in order to prevent them to move to a local competitor. The second, possible, effect is a negative welfare effect which is a direct result of the first real wage effect (Sinani and Meyer, 2004). Since the MNE's are capable of offering higher wages, it could attract the best labourers to move from local firms to the MNE's hereby leaving the domestic firms worse off.

But as Saggi (2002) elaborates; the effect of labour mobility is hard to measure because they leave no paper trail. If one really wanted to measure the effect properly, one would have to track individual labourers who have worked for MNE's and interview them on their future job prospective. This would also require a determination per labourer on their impact on the productivity of new employees once they enter a firm. For these reasons it is no wonder that empirical studies on this specific part of technology spillovers are scarce.

## 2.4 Competition

This spillover channel is driven by the search for more market power by both the MNE and the domestic firm. When a MNE enters the market, both firms are driven to increase or maintain their market power in order to secure their individual firm's profits. This will force both firms to make more efficient use of the existing resources and technologies or even adopt new technologies and exploit new resources (Caves, 1974; Markusen and Venables, 1999).

The results, however, can also have a negative impact on domestic firms. For domestic firms which are not able to compete with the MNE it could mean that they will lose a significant share of their market power. An imperfectly competitive domestic firm, with fixed production costs, will become an easy target for the competing MNE with lower marginal costs. Now, the MNE has an incentive to increase its production in order to decrease the market demand for products made by the domestic firm. The domestic firm in turn has to equalize its fixed costs over less products, increasing the total production costs per product (Aitken and Harrison, 1999).

In case the MNE can force enough domestic firms to operate on a less efficient scale, it is even possible that the net domestic productivity declines as well. In this case the MNE conquers the host market in such an aggressive way that the domestic firms simply have no time to profit from the technology or firm specific assets transferred by the MNE (Sinani et al., 2004).

## 2.5 Backward and forward linkages

FDI inflows can also generate spillovers through backward linkages in the host economy. This will be the case if local competitors, in the same industry as the MNE, can benefit from the upstream efficiency improvements that were induced by the MNE (Javorcik, 2004).

When the domestic firm's production process has increasing returns to scale, the presence of an MNE might increase their profits due to an increased demand for local supplies (Markusen and Venables, 1999; Görg and Strobl, 2002).

If the MNE's are also trying to assure a certain quality of their final product(s), the local suppliers could have more to gain. The MNE's could assure the quality standards of their suppliers in several ways; by providing technical support for the further development or improvement of their product(s), or by actually introducing new innovations to the domestic firm. The MNE could also provide support for the supply of new manufacturing goods such as machinery or raw materials. And, of course, they can be of assistance by providing for highly skilled staff at the different organizational and management levels (Lall, 1980).

In turn this could also result into two side effects; Firstly, the increased competition among the domestic suppliers, in order to become the main supplier of the MNE, could increase the efficiency of these competing firms. Secondly, the effect on other domestic firms which might also benefit from the presence of the MNE's if they also produce the same end-user consumer goods (Matouschek 1999).

The spillover effect can also be generated by forward linkages. Partly as a result of the gained backward linkages, domestic firms might become more productive. The MNE's direct or indirectly opened the host market for cheaper and higher quality intermediate products as well as finished products. The sale of these products may be accompanied by complementary services that were not available before the MNE entered the market. Although here the downside is that if firms cannot use these cheaper and qualitative better intermediate products in their advantage, they will experience negative effects associated with increased costs (Javorcik, 2004).

## 3 Within country income inequality

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In order to find a theoretical and empirical explanation of the influence of FDI inflows on the income distribution within a country, this chapter will briefly discuss the determination of income levels between different groups of labourers (e.g. high and low skilled, male and female, etc.) within a country because the difference between these levels basically determine the level of income inequality.

In chapter five and six the empirical model will be partly based on the findings of this chapter in order to include all the independent variables that are responsible for changes in income inequality.

Katz and Murphy (1992) find that changes in inequality between labour groups can be explained by changes in the rates of growth of different labour groups and the level of demand for educated labourers. They recognized three main forces that contributed to these changes and will be described in the following three paragraphs;

1. *Labour supply shifts*
2. *Labour demand shifts*
3. *Institutional factors*

### 3.1 Labour supply shifts

The changes in the characteristics of the labourers within a country are responsible for shifts on the labour supply side. There are three main categories that distinguish the characteristics of the total labour supply within a country; Age, sex and education (Katz and Murphy, 1992). The explanations of how these characteristics influence the real wage of a labourer are quite intuitive. If a labourer is young, this will have a depressing effect on its relative wage since this labourer is probably less experienced than older labourers. When the total group of young labourers relative to the total labour force increases, the overall wage distribution will widen by lowering the wages in the bottom (Dooley and Gottschalk, 1982).

In the U.S., Bloom et al. (1987) researched the effects of the baby boom in the fifties and sixties. Their main finding is an increase in the experience premium of wages during the first years after this generation had entered the labour market. This finding supports the theory that if the labour group

of low skilled labourers increase relative to the group of high skilled labourers, the overall income inequality will increase. Not only because the increased demand for high skilled labourers, which causes their wage to increase, but also since the increased demand for low skilled jobs decreases the incomes at the bottom (Katz and Murphy, 1991).

The wage differential between men and women has been a subject of public controversy for a long time. Most economists have explained the earning differentials in terms of the women's weaker commitment to their working careers, as reflected both in effort and in time input. Mincer and Polachek (1974) argue that "on-the-job investment" is the major source of the wage gap between the sexes. Women expect to retrieve from the labour force when they have children and they tend to invest less in "on-the-job training" and thus consequently enjoy more moderate wage rises in their working career compared to men. This results in a small wage gap between young men and women at the beginning of their career and a wider wage gap when both sexes get older. However, recent trends in western countries show that the share of women in the labour force is increasing, which seems good for the emancipation of the labour force, but in reality this means that women compete with low skilled labourers for the same jobs (Spain and Bianchi 1996). Of course the labourers in the more physical industries, like mining, do not suffer from these side effects but for other industries this could generate the same effects from an overflow of low skilled labourers as described above (Howell et al., 1991).

Changes in the relative supply of labourers with different levels of education also play a role in explaining wage trends. High levels of education are on average rewarded with higher levels of income and vice versa (Rumberger, 1987).

The labour force can, however, also be altered by immigration, adding more labourers with different characteristics to the labour force. The immigrants might change the wage setting within a country for instance if a lot of unskilled labourers migrate to a developed country. The inflow will result in more competition for low skilled jobs which will depress the wage level in the lower wage segments, resulting in a more unequal income distribution ( Borjas, 1993).

### 3.2 Labour demand shifts

The changes in the growth rates of supply cannot solely be held responsible for the changes in income inequality within a country, the demand side also plays its part. According to Levy and Murnane (1992) the demand for different groups of labourers is not only determined by the total

demand for final goods. They also recognize the importance of the state of technology within a country and the value of its currency.

The state of technology determines not only the types of final goods requested by the final consumers but also the knowledge of the labourers needed to produce these goods. An increase in the demand for service industry goods, which requires more higher skilled labourers, will increase the highest wages and, *ceteris paribus*, increase the income inequality. The income inequality in this argument could also increase between young and old labourers since age, as mentioned before, also is considered as an indicator of job experience and skills. Evidence of this particular argument is found by Mincer (1989) who showed that the wages of highly skilled labourers relative to low skilled labourers and the share of high skilled labourers as a percentage of the total labour force are the highest in the technologically most progressive countries.

If, on the other hand, the demand for manufactured goods would increase, which requires low skilled labourers, the lower wages would increase, *ceteris paribus*, narrowing the income inequality gap. The latter suggestion could also result in a bigger income inequality between men and women since generally more men tend to work in manufacturing jobs than women because of the physical requirements (Bourguignon, 1990).

The exchange rate partly determines the level of international demand for goods which means that all the earlier arguments also hold when fluctuations in the exchange rate occur (Goldberg and Kolstad, 1994). If the domestic currency increases, the domestically produced goods and services become more expensive for foreigners which, *ceteris paribus*, results in a lower international demand for both the demand for products and thus domestic labour. In turn, this could also determine the export decision of domestic and foreign MNE's since they could choose to move production to another country in order to increase their competitiveness by lowering production costs (Goldberg and Klein, 1997).

### 3.3 Institutional factors

Although the labour supply and demand shifts are the main determinants of changes in income inequality, the labour market operates in certain bandwidths which are set by non-market forces which, in turn, determine the rules and regulations of the labour market.

The government has an enormous influence by setting the minimum wage level (Stewart, 2004). Changes in the minimum wage, hence the name, have most effects on the lower income groups (e.g.

the younger, female and lower skilled labourers). Increasing the minimum wage would therefore result in a decrease in income inequality and vice versa.

The second biggest non-market forces are controlled by the labour unions. Neoclassical theories claim that unions would be responsible for an increased income inequality between organized and unorganized labourers (Friedman 1962). They view them as monopolies within the labour market who only strive to increase the wages of their members at the expense of non-member labourers. This anti-market power behavior would hurt the efficiency of the economy as a whole and is blamed for job losses due to union wage effects. When a labour union successfully bargains for higher wages, the industries or firms involved will face higher marginal costs since the price of their main input, wages, will increase. If the firms involved still want to generate their prospected profits, they will have to increase their market prices, thereby, reducing their competitiveness. The decrease in market power could result in a lower output, which in turn depresses the demand for labour by the firms, creating more unemployment within a country (Blau and Kahn, 1994).

Opposed to this scenario, that highlights the downside of the unions, is the empirical research by Freeman and Medoff (1984). They show that unions compress earnings within firms, standardize wage rates across firms and raise the wages of low-wage labourers. Through collective bargaining, unions have the possibility to induce; better management, higher productivity, the development of skills, the provision of company and industry information, improvement of the work floor morale and pressure on the management to work more efficiently. Plus, when joining a union a labourer will feel protected by an organization that has the power to overrule arbitrary management decisions and is able to reach out to politicians to make their case when necessary.

According to Leicht (1989), who researched the threat effects of unions, the equalizing effects of unions are stronger than the inequality caused by the unions wage premium, providing evidence of the positive side effects of labour unions.

The last important institution is the central bank which is indirectly responsible for the employment levels while using its main monetary policy instrument; the interest rates (Taylor, 1993). Whenever the central bank sets the interest rate, it makes a tradeoff between employment and inflation. Simply put<sup>8</sup>, if the central bank allows for a certain level of maximum inflation, they will slow down the market using the interest rate as instrument once this threshold level is exceeded. By increasing in the interest rate the central bank will trigger a decrease in the total demand for goods

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<sup>8</sup> This macroeconomic phenomena is too complex to elaborate completely in this paper. Suggested literature; Manning (1992) and Taylor (1993).



and services resulting in an decrease in total labour demand which will, in the end, lower inflation and increase the unemployment level. A decrease of the interest rates will , normally, trigger an opposite reaction and thereby feeding inflation and reducing unemployment.

## 4 FDI and inequality: Two hypotheses

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The second chapter described the possible effects of FDI inflows on the host economy while the third chapter provided a short overview of the economic forces that are responsible for the changes in wages of different groups of labourers within a country. In this chapter both strains of literature will be combined into two hypotheses with different explanations of the consequences of FDI inflow on income inequality; the modernization hypothesis and the dependency hypothesis (Bornschieer, 1983)<sup>9</sup>. Both recognize the role of developed countries as the home economies of MNE's and developing countries as host, and both give arguments that could be used to argue that FDI inflows both increases and decreases income inequality within the host economy. However, the historical perspectives and future prospects of both hypotheses do differ greatly.

### 4.1 The modernization hypothesis

The modernization hypothesis finds its roots in the basic economic theory of marginal productivity in combination with the propensities to save and consume<sup>8</sup>. It claims that the production levels need to be at a certain threshold level in order to redistribute. This is the center thought of the hypothesis; income inequality is a necessary step that needs to be taken in order to create a better overall income distribution.

The argument is in line with the well known income inequality theory of Kuznets' (1955) "inverted-U curve" according to which inequality levels increase at the early stages of development which will later decrease, after a certain level of development is reached. The increased income inequality during the early stages is caused by the development of a small and modern industrial sector within the economy which is the growth source. In time, the growing industrial sector starts to grant higher wages to attract more high skilled labourers. This will finally result in an increased level of inequality within each sector. Logically the result for the overall income inequality is the same (Adelman and Robinson, 1989). Once past this stage, output levels will increase and more labourers will shift from the traditional

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<sup>9</sup> The origin of both hypotheses lay in the development economics (Lipset, 1959), which have been modified by Biersteker (1982) and Bornschieer and Chase-Dunn (1985) to account for the influence of FDI. Bornschieer (1983) provides a distinct description of both perspectives.

agricultural sector to the modern industrial sector. This process will continue until the surplus of labourers in the agricultural sector disappears and the marginal products of both sectors are equal. Because of the growth process, real income levels increased resulting in less income overall income inequality.

The hypothesis integrates both chapter two and three in the following way. In the first phases of development, the established MNE('s) trigger(s) a labour demand shift. This will, as described in chapter three, deteriorate the overall income inequality. As explained above the spillover effects from chapter two are firstly only limited to the sector in which the MNE has settled. The flourished sector causes an increase in the relative demand for high skilled labourers and as a result causes an increase in high-skill wages relative to low-skill wages, provoked by the sector's technological progress. The consequence of the growth of this single sector is an increase in income inequality at the end of the first development stage. Once the spillover effects start to spread out over the whole country they will, using the accompanied technology and know-how, level the labour demand and supply gap again. As a result, this could also create a better environment for the establishment or improvement of institutional factors. Theoretically this should, as predicted by the hypothesis above, drop the level of income inequality even below its starting value (Acemoglu et al., 2007).

Several researchers have drawn conclusions in line with the modernization theory (Batra and Tan, 1997; Blomström and Kokko, 1996; Coe et al., 1994; Hanad and Harrison, 1993; Markusen and Venables, 1999;) all concluded that because of the increased levels of technology and capital within a country, caused by the establishments of MNE's, the overall level of efficiency and labour productivity, provoked by spillover effects as discussed in chapter two, increased. In the end, this could result in a more equal income distribution.

## 4.2 The dependency hypothesis

The dependency hypothesis is more critical towards the consequences of FDI flows as opposed to the modernization hypothesis. This hypothesis qualifies the existing income inequality as a result of historical events. It argues that the income inequality level is not determined by economic output but by social control and the organization of production. The most important factor in this line of argument is the position which a country holds in the world economy and the position of the economic actors within the economy.

In short, the idea is that the more economic dominance and influence countries have in the world economy, the more equal the distribution of power will be within these countries and thus the more equalized their income distribution (Rubinson, 1976). With exercising economic dominance one could think of the right of ownership, financial control, the ability to set market prices and other decisions that determine what is being produced, by whom, in what quantity and who is allowed to sell the product.

As a result the hypothesis recognizes two different types of countries; the ones that are economically important to the world economy, the dominant countries, and the dependent countries. The dominant countries have strong governments which control their internal production processes and markets, with only little foreign interference. Dependent countries have weak governments and allow a large amount of foreign control over their production and depend highly on foreign markets.

Within the dependent countries a class structure has formed which is dominated by a single elite class which has led to the formation of an economic and political alliance between the elite and foreign economic actors including MNE's. The alliance makes it possible for foreign actors to gain control over the local production. While the elite, with the help of FDI inflows, controls and develops the export sector, the development of the indigenous production in other industries is being suppressed. This means that the multiplier effect that leads to diversification of production, which occurs according to the modernization hypothesis, is not able to develop in the other, surrounding, industries resulting in a more unequal distribution of income (Bornschier, 1983).

The dependency hypothesis shows clearly that the influence of the institutional factors, discussed in chapter three, together with the strength of the government, are both indeed very important for the distribution of income.

Again both theories of chapter two and three integrate but now with a different result. The spillover effects positively influence the sector in which the MNE('s) settled which triggers a labour demand and supply effect just as mentioned in the previous paragraph. The next stage of development now depends on the country itself. If it is a dominant country, the development will continue just as predicted by the modernization hypothesis in paragraph 4.1. If it is a dependent country the organizational structure of the country will withhold the sector's spillover effects to transfer to the rest of the country as explained above.

Within the dominant countries, with strong governments, established institutional factors like labour unions, act in the best of interest for their labourers. Nafziger (1997) concluded that in countries with weak governments, MNE's might have negative consequences on the income distribution if they are able to pressurize host governments to cut welfare expenditures and labour unions to reduce their

wage claims. Both will hurt the lower and middle working classes enlarging the overall income inequality. If the MNE's job creation is of importance to the host economy, solely the threat of leaving the country could be enough to reduce the wage claim of the labour unions since this reduces the union's bargaining power (Rosen, 1969).

Thus within the dominant countries the spillover effects will cause for a deteriorated income inequality at first, but an improved level after the first development stages. The dependent countries are only letting a controlled sector develop, leaving the income inequality at a higher level than before.

Just as elaborated above, more researchers have stressed the possible negative side effects of FDI inflows. They argued that, in line with the hypothesis in the case of dependent countries, MNE's which depend on capital-intensive technologies indeed promote unemployment among unskilled labourers and, without government intervention, will deteriorate the income inequality within the host economy by creating a small advanced sector and a large backward sector (Jenkins, 1996; Lall, 1985; Muller, 1979; Nafziger, 1997; Robbins, 1996).

### 4.3 Which hypothesis holds?

Both hypotheses recognize the influence of FDI inflows on the rising levels of inequality within countries and make a clear distinction between the consequences for developed and developing countries. However, the future prospective is different depending of the governmental and organizational structure of the country.

The modernization hypothesis views the increased income inequality during the development stage of a country as a necessary stage that eventually will lead to a more equal income distribution. The dependency hypothesis argues that because of initial differences between countries in terms of government strength, internal market control and foreign market dependency, countries develop in different ways resulting in within country differences in the level of income inequality among countries. If it concerns a dependent country the worsened inequality is not a stage that, with the help of FDI spillovers, will improve. But it is the final stage that can only be altered by major structural changes within the country. This seems unlikely to happen because this would require that the elite class gives up their profitable position.

Based on these hypotheses it is not possible to tell if FDI inflows are increasing or decreasing the income distribution. The modernization hypothesis clearly states the negative side effect in the development stage, but it also points out that once a country is past this stage FDI inflows in other

sectors will eventually improve the overall income inequality. The dependency hypothesis does not blame the MNE's for worsening the income distribution, but it does acknowledge that FDI inflows are an evident factor if a country is not dominant enough.

To find out which hypothesis might hold, the next chapter will present the results of a conducted empirical research in which a regression analysis was performed to find more evidence on the influence of FDI inflows on income distribution.

# 5 Data and empirical strategy

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The two hypotheses described in chapter four suggested that spillover effects do occur in certain industries within countries, but the effect on overall income distribution depends on the hypothesis in favor, the stage of development and the government strength of the country in question.

This chapter will elaborate on the methodological approach used to find support for any of the two hypotheses by using ordinary least squares (OLS) regressions with input of empirical data. To cover both hypotheses, not only determinants of economic output indicators but also social indicators will be included to control for the organization of production.

The methodological approach is based on the study of Dollar and Kraay (2002)<sup>10</sup>. The results of the used methodology are shown in the next chapter.

## 5.1 Data description

The regressions are based on the income data of the 21st century. Since data on income inequality is scarce and in most cases only available in national databases, this paper makes use of a already existing set of data from three different sources collected by Dollar and Kraay (2002). Their dataset contains, in addition to self gathered data, income distribution data taken from datasets of Deiniger and Squire (1996), Chen and Ravallion (2000) and Lundberg and Squire (2000). This adds up to a dataset existing of 953 observations covering 137 countries over the period 1950-2000.

The income distribution data adds up to a total data set which is a highly unbalanced and irregularly spaced panel of observations. Some countries have recorded continues time series of annual observations on income distribution available for long periods of time. Most countries however have only few observations available over the total time span.

Data on FDI however is widespread. The data used is taken from the World Bank Database (WDI Online) and the Organization for Economic Co-operation and Development statistics online database. Combined, both sources cover data over the period of 1960 till 2007.

Since this paper aims on finding evidence on income inequality on the medium and long run in a wide and evenly divided sample of countries and observations, the sample<sup>11</sup> is therefore adjusted to

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<sup>10</sup> Their final estimator is similar to the one used in this paper, however due to heterogeneity problems with the data on FDI, this paper does not make use of a GMM estimator, but a more simple OLS (see paragraph 5.3).

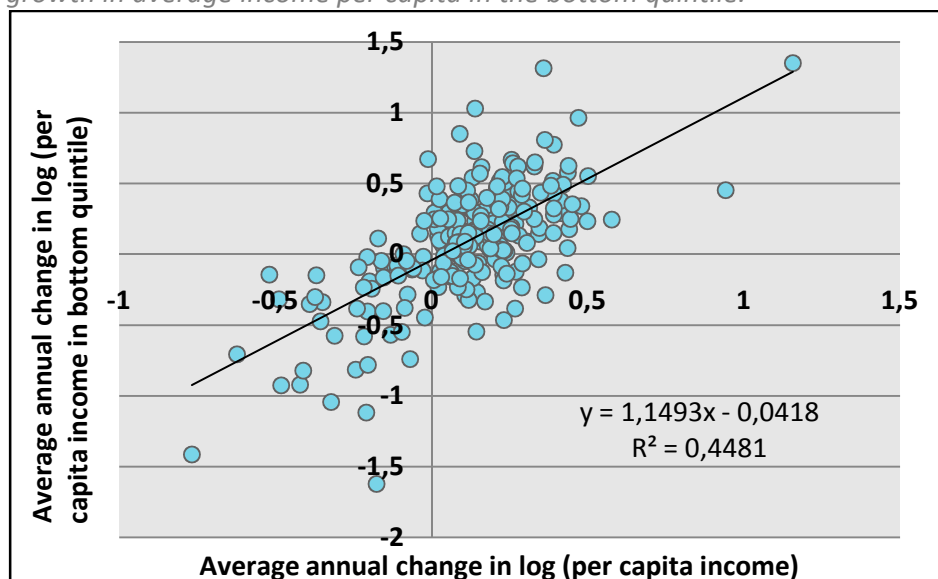
meet the constraint of a minimum of five years between each observation. The annual data on income inequality is the base of the regression data to which all the other data is matched. The result is a data set consisting of 239 observations with a median of 4 observations per country from 1960 till 2000.

## 5.2 The choice of the dependent variable

To estimate the influence of FDI on income inequality, a way of measuring the level of income inequality will be needed. Most research on income inequality is performed using GINI coefficients. However, this data is scarce which greatly limits the number of observations one could use. For this reason, Dollar and Kraay (2002) created the dataset mentioned in the previous paragraph. They even claimed that, at that time, their dataset on income distribution is the largest one available.

Since data on income levels and income shares of the richest are also not available, the only two usable and available income measures are; income levels and shares of the bottom quintile and overall income levels and shares. Dollar and Kraay (2002) used these to calculate the variables which are depicted in figure 2.

Figure 2: The relationship between annual growth in overall average income per capita and annual growth in average income per capita in the bottom quintile.



Source: Dollar and Kraay dataset (2002) (see appendix A1 for more details)

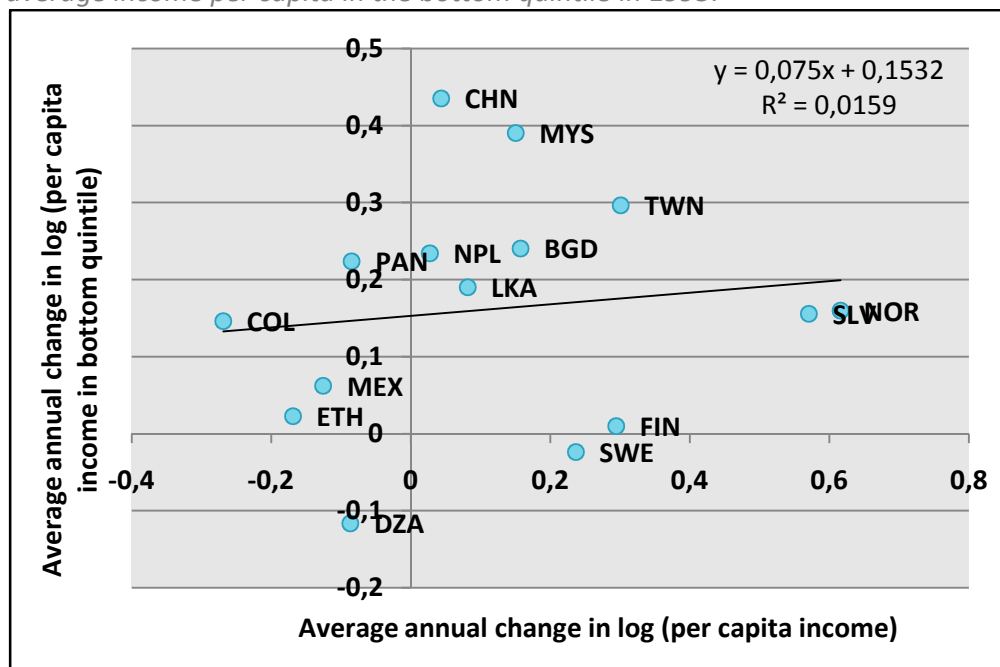
<sup>11</sup> Definitions and sources for all the variables used in the data sample are provided in appendix A1. A list of all included countries is given in appendix A2. Paragraph 5.4 motivates and elaborates shortly on the choice of the additional variables.



Figure 2 depicts the relationship between the growth of average annual per capita income and the growth of average annual per capita income in the bottom quintile for 92 countries covering the period 1950 till 2000. The sample consists of 284 pooled observations in total, with at least 1 observation per country and a median of 3 observations per country. The growth periods have a minimum size of 5 years. The figure shows a strong relationship between both variables with a slope of 1.15. Statistical tests confirm that the null-hypothesis, the slope equals 1, cannot be rejected.

Thus, figure 2 shows that, on average, incomes in the bottom quintile seem to rise equiproportionately with average incomes. However, on average also means that the regression outcomes do not represent a systematic relationship between average incomes within the bottom quintile and the overall average income.

Figure 3: The relationship between growth in overall average income per capita and growth in average income per capita in the bottom quintile in 1995.



Source: Dollar and Kraay dataset (2002) (see appendix A1 for more details)

Figure 3 shows more clearly that there is no such relationship once only one, randomly chosen, year is depicted. Only Taiwan (TWN) and Algeria(DZA) have linear growth rates, all other

countries have different growth rates for their average incomes compared to the bottom quintile. This means that there are forces of income growth active within the economy causing both variables to grow differently.

To identify the economic growth forces of both income groups and to check whether FDI inflows is one of them, the difference between the two income variables, the logarithms of overall average income per capita ( $y$ ) and average income of the bottom quintile per capita ( $by$ ), will form the bases of the depended variable of the following regression equation. These variables will be used to measure the income inequality in the dataset of paragraph 5.1 by calculating the gap between the two and use this as the dependent variable to estimate what causes this new variable to change. This is based on the assumption that at the moment that the gap between average overall income and average income of the bottom quintile within a country narrows, the income inequality decreases and vice versa.

### 5.3 Empirical model

As elaborated in the paragraph above, the estimator of the empirical model will combine information in both levels and changes of the data. However, this difference estimator is not only chosen because of its two dimensional estimation properties, but also because it disposed of any time-invariant country specific sources of heterogeneity within the sample, which was a problem at first while estimating the data<sup>12</sup>. Using OLS the following regression will be estimated;

$$(y - by)_{ct} - (y - by)_{lct} = \beta_1 \cdot (FDI_{lct} - FDI_{2lct}) + \dots + \beta_n \cdot (X_{lct} - X_{2lct}) + (\varepsilon_{ct} - \varepsilon_{2lct}) \quad (1)^{13}$$

Where the country and time specific variables are given by respectively (c) and (t). As discussed in the data description, the data points are country and time specific, whereas (ct) denotes the end of a time period in which the variable is measured, (lct) is the one period lagged value and (2lct) is the second lagged value. FDI stands for FDI net inflow measured in current US dollars which is obviously

<sup>12</sup> Mainly for this reason this estimator, once proposed by Arellano and Bover (1995) and evaluated by Blundell and Bond (1998) (with a GMM estimator), is also used by Dollar and Kraay (2002).

<sup>13</sup> Dollar and Kraay (2002) did not use this exact equation. Their dependent variable was average income in the bottom quintile and the main control variable overall average income, but they still drew conclusions on income inequality based on the relationship of the two variables. Since the importance of FDI inflows in this study the equation is altered to capture the influence of FDI inflows on income inequality.

the most important control variable in this model. Additional control variables are denoted by (X) and are discussed in the next paragraph.

The right-hand-side of the regression makes use of lagged values because of two reasons. Firstly, the regression is meant to capture both the direct and indirect effects of FDI inflows. A direct effect could be the immediate creation of jobs, or wage increase, when an MNE settles in the host economy. An indirect effect could be the transfer of knowledge when a former MNE employee starts to work for the competition. The latter effect will obviously not be immediate, just as the creation of forward and backward linkages and the possible side effects these might cause once established. Secondly, the use of lagged values might provide evidence for one of the two hypotheses mentioned in chapter four. Both agree on increased levels of income inequality in the early stages of development when the MNE only just established, but only the modernization theory suggests that after this stage income inequality will decrease in developed countries<sup>14</sup>.

By taking second lagged values the regression might be able to capture the decrease in income inequality after the first stage of development. Using differences, lagged and twice lagged values does reduce the sample size substantially but this proved to be the best possible way to create a consistent estimator.

## 5.4 Additional control variables

The choice of the remaining control variables is mainly based on the findings in the previous chapters and, as elaborated below, findings by other researchers on key elements of income growth and distribution<sup>15</sup>. All included variables are averaged over five years up to and including the year (t) per country (c) as given in equation (1) to correct for outliers in the data.

In chapter three, the three main determinants of income inequality were described; Labour supply shifts, labour demand shifts and institutional factors. The following sub-paragraphs will elaborate on the choice of additional control variables using these three categories.

### 5.4.1 Labour supply control variables

For the first determinant it proved to be hard to find a measurable variable. Preferably, one would add data that could be responsible for changes in the demographic characteristics of the labour

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<sup>14</sup> See paragraph 5.6 for the distinction between developed and developing countries.

<sup>15</sup> Given the extent of the Dollar and Kraay (2002) paper, I did not use all their variables but only the ones that are of similar importance to FDI inflows and income inequality.

supply. But the availability of such demographic data is very limited and thus using this scarce data would greatly reduce the number of observations<sup>16</sup>. However, not including this data will probably result in a lower r-squared since the explanatory power of the regression will drop when leaving out important influential explanatory variables. But this is the only option since the regression outcomes would be useless if even less than ten percent of the original dataset would be used.

To compensate for the lack of data on labour supply, primary - and secondary education variables will be included. The educational variables are measured in average stock of years of education. The expectation is that primary education has a positive effect on income inequality since it increases the basic skills of the population. Secondary education however, is expected to have a negative impact on income inequality. Especially in developing countries where skilled workers are scarce, this is expected to improve the individual employee's bargaining position for a higher wage increasing the income inequality gap (Wood, 1997).

#### 5.4.2 Labour demand control variables

Labour demand shifts will be captured by changes in the levels of import, export and indirectly by inflation<sup>17</sup>.

Indicators of trade are used since, as mentioned before, sufficient data on employment is unavailable and because labour demand is highly correlated with total demand for goods and services (Levy and Murnane, 1992). A measure of trade openness is calculated consisting of total imports and exports relative to GDP. By doing so, total demand for goods from and to the host country are measured in one variable.

It is a well documented phenomena that higher levels of trade generate higher levels of income (Frankel and Romer, 1999; Irwin and Terviö, 2002). Trade increases overall levels of income within countries by accelerating the accumulation of physical and human capital and by increasing the output for given levels of capital. Frankel and Romer (1999) conducted a research purely on this connection and found that even after controlling for geographic factors, increasing trade levels are highly significant with increasing levels of overall income. Wood (1995) complements this view and

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<sup>16</sup> Ignoring this fact and including the data in the data sample would have made it impossible to calculate changes in the explanatory variables or lagged data. Because after adding data on males, females and the share of young and older persons in the total workforce only twelve countries remained with more than one observation. The same holds for data on industry-, service- and agricultural employment and overall unemployment, in this case, only nine growth observations remained after adding data from three different sources (WDI online, OECD- and IMF statistics).

<sup>17</sup> See 5.4.3

adds to the argument that low skilled workers are the victims of this overall growth in prosperity. His research describes how, in line with the Heckscher -Ohlin theorem (Ohlin, 1933), international trade between developed countries and developing countries depresses the wage of low skilled workers. To improve their market power companies in developed countries lower the wages of their low - skilled workers while developing countries keep them low for the same reasons.

All of the studies mentioned above, show the importance of the effect of openness on income but these studies only use GDP per capita as variable in their research. The effect on the incomes in the bottom quintile and the effect on income inequality are therefore still unknown.

#### 5.4.3 Institutional factor control variables

To control for the institutional and social factors, inflation, government consumption and rule of law are included in the sample.

Inflation is an indicator that could be linked to all three determinants of income inequality but is eventually, although indirectly, controlled by the central bank by setting the interest rate as mentioned previously in chapter three. Paragraph 3.3 explained that an increased inflation would feed overall consumption levels and decrease unemployment. It is therefore to be expected that the relationship will be positive, just as Albanesi (2007) found in his study which was solely on the relationship between inflation and inequality. The variable is simply the logarithm of the inflation rate plus 1.

Government consumption is measured as a share of GDP. The dependency hypothesis suggested that weak governments allow elite classes to self enrich and thus do not seem to have the improvement of the welfare level of the entire population as most important goal. According to the hypothesis a lower level of government consumption should thus correlate with higher levels of income inequality.

An indicator for the rule of law is added as a measure for weak and strong governments. High values correspond with strong governments and should thus correlate with lower income inequality.

Both hypotheses emphasize the importance of the low skilled agricultural industry in the development stage. Therefore this indicator will be captured by a measure of arable land per capita (in hectares). In line with both hypotheses, most pro-poor growth literature assigned agriculture improvement policies priorities when it came to the list of policies that should be implemented in order to promote the poor, to achieve a more equal income distribution. This is no surprise since most

developing countries have two things in common; Firstly they have a greatly sized agricultural industry and secondly, this is mostly the only industry that contributes to the welfare of the general population (Matsuyama, 1991). As a result, most of the population is employed in the agricultural industry. According to the World Bank (2003) some 40 to 60 per cent of the national income in developing countries is produced in the agricultural industry and some 50 to 80 per cent of the population is employed in this industry. For this reason it is expected that this variable will be positively correlated with the dependent variable.

## 5.5 Developed versus developing countries

In chapter four both the modernization hypothesis and the dependency hypothesis show that in the development stage of a country FDI inflows can cause a more unequal income distribution. In order to check whether FDI inflows do indeed have more effect on developing countries, another model is estimated which has excluded all developed countries from the sample.

Because no convention is established for the designation of developed and developing countries, the United Nations simply named all the developed countries, whose example is followed by the International Monetary Fund and the Organization for Economic Co-operation and Development. The lists of both groups of countries is based on their lists of countries which is exactly equal for all three organizations and shown in appendix A2.

## 5.6 The influence of openness to trade

The evidence regarding the level of openness in determining the level of FDI flows is mixed. The main argument linking the two is that since most investment projects are directed towards the tradable sector, the level of openness to international trade should also be a relevant factor in this decision (Kravis and Lipsey, 1982). Edwards (1990) found a strong positive effect of openness on FDI. However, Schmitz and Bieri (1972) did not find such a strong relationship and Wheeler and Mody (1992) retrieved negative and positive results depending on the industry in question.

Table 2, on the next page, shows the correlation of FDI net inflows and the calculated openness index<sup>18</sup> within this dataset.

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<sup>18</sup> Import plus exports as a share of GDP, see appendix A1 for more details.

*Table 2: Correlation between FDI inflow and openness for trade*

Dependent Variable: FDI net inflow				
Included observations: 158				
Variable	Coefficient	Standard error	t-Statistic	Probability
Openness index	7.6214	1.9173	3.9750	0.0000
Constant	24.4654	0.8561	28.5772	0.0000
R-squared	0.0919	Prob(F-statistic)		0.0000

*Sources: Dollar and Kraay dataset (2002), WDI online, OECD statistics (see appendix A1 for more details)*

Because of the strong and positive correlation between FDI inflow and openness for trade found in this dataset, the model from paragraph 5.3 will be re-estimated to check whether the influence of FDI inflows on income inequality increases if all the countries in the sample are “open” to trade according to two different criteria.

The variables will be selected using two dummies to estimate two variants of the first model. Sachs and Warner (1995) wrote a paper on global integration in which they thoroughly describe and classify each individual country whether if they are open or closed. To create a model with only countries that are open to trade a dummy will be used that has the Sachs and Warner values<sup>19</sup>. Subramanian and Shang-Jin (2007) found strong evidence that the World Trade Organization (WTO) has had a strong positive impact on trade, amounting to about 120 per cent of additional world trade in 2000 alone. Therefore the second dummy variable will adjust the model to include only member countries of the WTO or its predecessor Generalized Agreement on Tariffs and Trade (GATT)<sup>20</sup>. Both dummies are, just like all other variables, averaged over five years up to and including the year (t) per country (c) as given in equation (1).

<sup>19</sup> 1 if open, 0 if closed. The complete list of countries included can be found in appendix A2 table 10.

<sup>20</sup> 1 if member, 0 if not. The complete list of countries included can be found in appendix A2 table 10.

## 6 Results

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The following chapter will describe the empirical research which is conducted in line with the strategy described in chapter five. A few reminders of earlier remarks have to be made before the results are shown. First of all, the estimations below reflect the effect of changes in the lagged control variables on changes in income inequality. In other words, the regression's aim is to verify how changes in FDI inflow and the other control variables in the past, result in recent changes in income inequality. Secondly, the signs of the coefficients should be interpreted in an opposite way. A negative sign stands for a decrease in the difference between the overall average income level and the average income in the bottom quintile which is a positive effect. And lastly, no conclusions can be drawn from the coefficient itself. All time gaps have a minimum of five years between each observation but have no maximum restriction. This means that annual values cannot be calculated and thus will not be mentioned.

### 6.1 OLS regression of the complete dataset

This first specification regresses the change in income equality on all other lagged control variables in the sample as specified in equation (1). This regression consists of 90 observations divided over 21 developed countries with 36 observations and 27 developing countries with 54 observations<sup>21,22,23</sup>.

The regression results are shown in table 3 on the next page and will be discussed per variable.

#### 6.1.1 Income inequality

The regression outcome in table 3 shows a small, positive, effect of lagged FDI inflows on the income inequality gap, significant at the 10 per cent level, which means that within the complete sample that contains both developed and developing countries the overall effect is a decrease in income inequality. Thus if one only considers the complete dataset, the overall effect of possible FDI spillovers on income inequality is positive.

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<sup>21</sup> The complete list of countries is given in appendix A2.

<sup>22</sup> This is obviously a lot less than the original number of observations in the dataset but as elaborated in chapter four, the use of lagged and twice lagged data requires a minimum of three observations per country.

<sup>23</sup> Insignificant variables are not included in the model.



*Table 3: OLS regression of equation (1) with use of the complete dataset.*

Dependent Variable: Income inequality gap				
Included observations: 90				
Growth variable	Coefficient	Standard error	Probability	
FDI inflows	-0.0292	0.0153	0.0882	*
Inflation	0.5761	0.1452	0.0002	***
Government consumption	-1.9240	0.9282	0.0413	**
Arable land	0.2725	0.1363	0.0488	**
Constant	0.0449	0.0274	0.0963	*
R-squared	0.3489	Probability (F-statistic)	0.0000	
Breusch Godfrey (F-statistic)	0.3424	Ramsey (F-statistic)	0.5586	
White (F-statistic)	0.6244			

*a Sources: Dollar and Kraay dataset (2002), WDI online, OECD statistics (see appendix A1 for more details)*

*b All control variables are lagged with respect to dependent variable*

*c \*\*\* significant to <0.01, \*\* significant to <0.05, \* significant to <0.1.*

*d Insignificant variables are not included in the model*

*e Standard errors are corrected for heteroskedasticity and for the first-order autocorrelation using a standard Newey-West procedure.*

With regard to the question raised in the introduction this first result is promising because it supports the claim that governments are indeed justified when promoting FDI inflows with regards to income inequality. An increase in FDI inflows will in time, indeed, lead to a more equal income distribution.

This result is in line with the studies of Batra and Tan (1997), Blomström and Kokko (1996), Coe et al. (1994), Hanad and Harrison (1993) and Markusen and Venables (1999)<sup>24</sup>.

However, this first regression does not provide any evidence for one of the two hypotheses, discussed in chapter four, simply because the sample is a mix of developing and developed countries. Both hypotheses claim that developing countries should have a more equal income distribution compared to developed countries as explained in chapter four. The next paragraph will therefore separate both in order to test if the consequences for income inequality due to FDI inflow do differ between developed and developing countries.

### 6.1.2 Inflation

Although chapter three mentioned that an increased inflation would feed overall consumption levels and decrease unemployment, it still has a highly significant, at the 1 per cent level, negative effect on overall income inequality. This means that with rising levels of inflation the overall average incomes increase faster than the income levels in the bottom quintile.

<sup>24</sup> See chapter five for a more extensive explanation of their findings.

The result is in line with both the studies of Easterly and Fischer (2001) and Erosa and Ventura (2000). It seems plausible to argue that this is caused by the compensation characteristics of the labourers. Typically the labourers at the average income level are more likely to receive additional inflation adjusted non-wage benefits. In addition it could also be that more average income earners are employed in unionized industries with indexed wages. Therefore, these labourers face no or little wage loss. These benefits could be excluded to a large number of labourers in the bottom quintile leaving them less protected from inflation than other labourers (Erosa and Ventura, 2000).

### 6.1.3 Government consumption

The largest significant coefficient in this result is lagged government consumption. It suggests a strong positive relationship between government consumption and future income inequality at the 5 per cent significant level. Previous chapters already reasoned that this effect quite intuitive but these only considered the opposite (negative) effects of little government consumption.

Cavallo (2005) also shows that increased government expenditure directly results in a decrease of unemployment, which seems to be the direct result of redistributive policies attached to government expenditures, like investments in education. Aiyagari et al. (1990) explains with the help of a theoretical model that government consumption over time acts as a multiplier effect ensuring that the impact of the long run effects exceed the direct impact.

### 6.1.4 Arable land

The last control variable that should add to the explanation of changes in income inequality raises more questions instead. An increase in arable land per capita was expected to decrease the income gap, especially since, as mentioned in chapter five, in most developing countries typically a minimum of 50 per cent of the population is employed in the agricultural industry, but maybe this is exactly why the coefficient is negative. Most land is owned by rich farmers who expanded their land over time since, due to the green revolution, new technologies made it easier to hold more land and even generate relatively more yield than before.

Freebairn (1995) performed a research in which he compared multiple studies on this topic, he finds that over 80 per cent of the sample, of published studies reviewed on the effects of higher yield varieties of technology, concluded that greater inequality resulted.

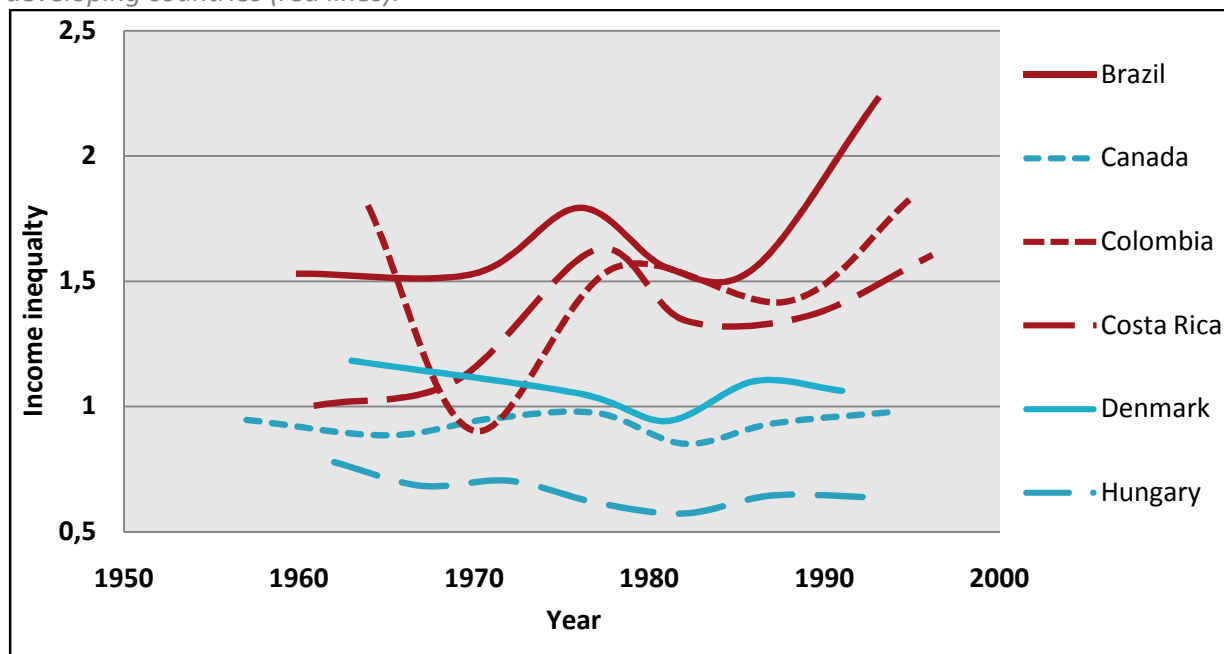
## 6.2 Two regressions: Developed versus developing countries

The result of the regression in the previous paragraph was in favor of the countries which governments actively promote the attraction of (more) FDI inflows. In order to find evidence of any of the two hypotheses described in chapter four this paragraph will make a clear distinction between developed and developing countries. Therefore, the sample is separated to create two new samples, one with only the developed countries from the original sample and one with only the developing countries.

### 6.2.1 A regression including only developed countries

Regressing the sample with only the developed countries, did not result in a single model with any significant variables above the minimum 10 per cent level. For this reason it cannot be tested if FDI inflows in developed countries indeed improves income inequality as argued by the dependency and modernization hypotheses. It is possible however, to explain this phenomena and make some assumptions based on the following figure and table which are in line with both hypotheses.

Figure 4: Income inequality trend in three random developed (blue lines) and three random developing countries (red lines).



Source: Dollar and Kraay dataset (2002) (see appendix A1 for more details)

A plausible explanation of the shortage of significant results is shown in figure 4 on the previous page. It depicts the trend of income inequality within six randomly chosen countries, three developed and three developing countries. Table 4 below shows the descriptive statistics of the used variable for income inequality of all developed and developing countries. While the minimum size of the income inequality gap does not differ for both groups of countries, the contrary holds for the standard deviation and maximum size of the gap. Figure 4 is a perfect example of the constantly sustained level of income inequality in developed countries and at the same time the large changes in income inequality in developing countries. Combined, figure 4 and table 4 clearly show that within developed countries in the past forty years the deviations are not only less extreme but also less frequent than developing countries.

*Table 4: Descriptive statistics of income inequality variable*

	Developed countries		Developing countries	
	Income inequality	FDI inflow	Income inequality	FDI inflow
<b>Mean</b>	0.9756	2.57E+14	1.2367	1.34E+14
<b>Median</b>	0.9570	2.50E+14	1.2029	6.80E+09
<b>Maximum</b>	1.4719	8.82E+14	3.0830	5.80E+14
<b>Minimum</b>	0.5094	1.10E+08	0.5103	78000.00
<b>Standard deviation</b>	0.2367	2.02E+14	0.3934	1.73E+14
<b>Observations</b>	112	97	301	169

*Source: Dollar and Kraay dataset (2002) (see appendix A1 for more details)*

Although there is no significant correlation the table does show that developed countries do not only have a more equal income distribution, they also attract more FDI than developing countries. This suggests that once countries are well developed a stable political and economical structure protects the labour force from possible sudden changes in income levels due to FDI or any other economic force. It can be depicted that if the dependent variable hardly changes between two observations, as in figure 4, it is obvious that no significant trend can be estimated for the control variables.

### 6.2.2 A regression including only developing countries

The following regression estimation in table 5 consists of only the 27 developing countries that were included in the first model, of paragraph 6.1, to test the emphasized difference between developed and developing countries, as described in both hypotheses in chapter four<sup>25</sup>.

<sup>25</sup> The complete list of developing countries is shown in table 9 in appendix A2

*Table 5: OLS of equation (1), only developing countries are included (see appendix A2)*

Dependent Variable: Income inequality gap				
Included observations: 54				
<b>Growth variable</b>	<b>Coefficient</b>	<b>Standard error</b>	<b>Probability</b>	
FDI inflows	-0.0392	0.0142	0.0334	**
Inflation	0.5438	0.1613	0.0011	***
Government consumption	-1.7561	1.0500	0.0982	*
Arable land	0.2339	0.1126	0.0409	**
Constant	0.0268	0.0177	0.0924	*
R-squared	0.3847	Probability (F-statistic)	0.0000	
Breush Godfrey (F-statistic)	0.5453	Ramsey (F-statistic)	0.3932	
White (F-statistic)	0.4683			

*a Sources: Dollar and Kraay dataset (2002), WDI online, OECD statistics (see appendix A1 for more details)*

*b All control variables are lagged with respect to dependent variable*

*c \*\*\* significant to <0.01, \*\* significant to <0.05, \* significant to <0.1.*

*d Insignificant variables are not included in the model*

*e Standard errors are corrected for heteroskedasticity and for the first-order autocorrelation using a standard Newey-West procedure.*

As shown in table 5, there is no negative relationship between FDI inflows and the income inequality gap. In comparison with the estimation of the basic model, it even contradicts to the claimed increase of the hypotheses. The regression coefficient increased by one tenth which is an increase of more than 30 per cent compared to the basic model. This would indicate that both hypotheses simply do not hold. The empirics seem not to be in line with the modernization hypothesis nor the dependency hypothesis which both predict rising levels of income inequality in developing countries. However it is more likely that this is due to the composition of the countries within the sample.

Since, as mentioned in chapter five, there is no convention established for the designation of developed and developing countries, there is no quantitative measure to distinguish when countries are in different development stages. Therefore it is likely to assume that the sample of developing countries contains countries that are already past the first development stage, countries that are in the first development stage and countries that still did not start developing. In the first scenario FDI inflows would, according to the modernization hypothesis, cause an decrease in income inequality and in the third scenario FDI inflows are minimized as well as the aggravating effect on income inequality. The dependency hypothesis argues that only countries with strong governments can experience an decrease in income inequality and all other scenario's would lead to an increase. In short, if one would average these possible scenario's the overall result could be a positive estimator as shown in table 5.

Thus, based on these two regressions, the hypotheses cannot be rejected. They are, however, weakened by the fact that the result does not only contradict their prediction, but also the regression coefficient is even stronger than the coefficient of the basic model. It would have been more helpful if one of the social control variables, like rule of law, would have been significant. This way it might have been possible to validate the dependency hypothesis's influence of governments and their social structure.

Nevertheless, this result is very promising and hopeful for developing countries in general. It calls for more FDI into developing countries confirming the claim that FDI is a key ingredient of successful economic growth and development in developing countries (Klein et al., 2001).

In comparison to the first model in paragraph 6.1 both the negative effect of arable land and the positive effect of government consumption decreased. The first is likely to be caused by the level of technology in the agricultural industry in developing countries (Freebairn, 1995) while the latter is almost certainly, as elaborated in paragraph 6.1, the lesser - or complete absence of redistribution policies within developing countries (Bruno et al., 1999). The negative effect of inflation almost remained the same, showing that even in developing countries the poor are more likely than the rich to mention inflation as a top national concern (Easterly and Fischer, 2001).

### 6.3 A regression on only the countries which are open to trade

Because of the strong and highly significant correlation between total trade flows and FDI inflow, as shown in table 2 in paragraph 5.6, another regression has been estimated with help of openness dummy variables. These dummies adjust the sample to include only the countries that are found to be open for trade, according to two criteria as explained in chapter five<sup>26</sup>. Since the openness index variable<sup>27</sup> has not been significant in any model, this model might help explaining the relation between trade, FDI and income inequality.

Table 6 on the next page shows that both dummies produce regression coefficients for FDI inflows that are almost two times the size of the coefficients of the first model in paragraph 6.1. This indicates that if a country is open for trade the positive spillover effects of FDI inflows on income inequality almost double.

However, the effect is still measured over a minimum time period of five years and is therefore still quite small. But it does make it clear that whenever a country wants to introduce a policy to

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<sup>26</sup> The complete list of included countries per dummy is given in appendix A2, table 10.

<sup>27</sup> Import plus exports as a share of GDP, see appendix A1 for more details.

attract FDI inflows in order to profit from the spillover effects, it might have on its economy, it should also implement policies that promote overall trade in order to maximize the result on income inequality improvement.

*Table 6: OLS of equation (1), only open countries are included*

	Sachs and Warner dummy			WTO/GATT dummy		
Dependent Variable:	Income inequality gap			Income inequality gap		
Included observations:	64			80		
Growth variable	Coeff.	St. error	Prob.	Coeff.	St. error	Prob.
FDI inflows	-0.0552	0.0262	0.0162 **	-0.0408	0.0248	0.0281 **
Inflation	0.5950	0.1527	0.0002 ***	0.5869	0.1605	0.0004 ***
Government consumption	-2.2184	0.9514	0.0222 **			
Constant	0.0252	0.0143	0.0826 *			
R-squared		0.3888			0.3406	
Probability (F-statistic)		0.0000			0.0000	
Breush Godfrey (F-statistic)		0.7486			0.3099	
White (F-statistic)		0.9362			0.9484	
Ramsey (F-statistic)		0.2594			0.3175	

*a Sources: Dollar and Kraay dataset (2002), WDI online, OECD statistics (see appendix A1 for more details)*

*b All control variables are lagged with respect to dependent variable*

*c \*\*\* significant to <0.01, \*\* significant to <0.05, \* significant to <0.1.*

*d Insignificant variables are not included in the model*

*e Standard errors are corrected for heteroskedasticity and for the first-order autocorrelation using a standard Newey-West procedure.*

If all three regression models are compared, the other significant variables do not seem to vary significantly, except for government consumption. Whereas the influence decreased for developing countries, it increased for countries that are open to trade according to the Sachs and Warner index. Rodrik (1998) comes to the same conclusion when researching the correlation between any measure of government spending and its openness towards trade. He defines a plausible hypothesis that is also in line with the data found in this paper. The hypothesis explains that the vulnerability of open countries to external shocks is larger than that of closed countries. This means that the influence of government consumption decreases, weakening the effect of the distributional policies. Therefore, the government usually increase their spending as a way to reduce the risk of the increased foreign exposure.

## 7 Conclusion and remarks

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This paper has shown, with the help of empirical data, that governments which implement a policy to attract more FDI inflow, are justified because FDI does indeed create positive spillover effects, which have a positive influence on the equalization of the income inequality of all countries.

In the economic literature two hypotheses exist, the modernization- and the dependency hypothesis, that explain the consequences of FDI inflows for the host economy. An extensive research reveals little evidence to back up any of the two hypotheses. Even when the distinction is made between developed and developing countries the estimations do not show any evidence of deteriorating income inequality as predicted by both hypotheses. These estimations do show significant positive results for developing countries. It is therefore good to emphasize that there is no evidence found of any Kuznets curve effect, in which one industry develops, first increasing income inequality, and only at a later stage causes a multiplier growth effect in other industries, equalizing income distribution further than its starting position.

After the sample was adjusted, the outcome was not only more significant but it also lead to almost doubled regression coefficients. Governments which are planning to implement policies to increase the inflow of FDI in order to achieve more spillover effects are therefore advised to also implement policies that stimulate ordinary trade as well. If so, countries can almost double the positive effect of FDI inflow on income distribution.

However, there are three important caveats to these conclusions. First of all, the effects are not estimated with great precision. The data set is a highly unbalanced and irregularly spaced panel of observations which means that the sizes of the coefficients are not useful in determining the strength of the effects. Secondly, the explanatory value would also have been stronger if some of the social variables would have been significant. Thirdly, the lack of distinction between, underdeveloped, less developed and developing countries makes testing both hypotheses predictions on developing economies impossible. A method of distinction could have lead to more decisive conclusions with respect to both hypotheses.

Thus, although the results greatly bolster the case for the benefits of FDI inflow, they do not provide decisive evidence for it.



# References

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Acemoglu, D., S. Johnson, J.A. Robinson and P. Yared, (2007), "Reevaluating the Modernization Hypothesis", National Bureau of Economic Research, Working Paper, 13334.

Adelman, I. and S. Robinson (1989), "Income Distribution and Development," in H. Chenery and T.N. Srinivasan, Handbook of Development Economics, New York: North Holland, pp. 949-1003.

Aitken, B. and A. Harrison (1999), "Do Domestic Firms Benefit from Direct Foreign Investment? Evidence from Venezuela", American Economic Review, 89, pp. 605-618.

Aiyagari, S.R., J. Lawrence, J. Christiano and M. Eichenbaum (1990), "The Output, Employment, and Interest Rate Effects of Government Consumption", National Bureau of Economic Research, Working Paper Series, 3330.

Albanesi, S. (2007), "Inflation and Inequality", Journal of Monetary Economics, 54, pp. 1088-1114.

Arellano, M. and O. Bover (1995), "Another look at the Instrumental-Variable Estimation of Error-Components Models", Journal of Econometrics, 68, pp. 29-52.

Barrios, S. and E. Strobl (2002), "Foreign Direct Investment and Productivity Spillovers: Evidence from the Spanish Experience", Weltwirtschaftliches Archiv, 138, pp. 459-481.

Barro, R.J. and J. Lee (2000). "International Data on Educational Attainment: Updates and Implications". Harvard University Center for International Development Working Paper, 42.

Batra, G., and G. Tan (1997), "Malaysia: Enterprise Training, Technology and Productivity", Washington DC: World Bank.

Biersteker, T. (1982), "Distortion or Development?: Contending Perspectives on the Multinational Corporation", The MIT Press, Cambridge.

Blau, F.D. and L.M. Kahn (1996), "International Differences in Male Wage Inequality: Institutions Versus Market Forces", National Bureau of Economic Research, Working Paper, 4678.

Blomström M. (1991), "Host Country Benefits of Foreign Investment", National Bureau of Economic Research, Working Paper Series, 3615.

Blomström, M. and A. Kokko (1996). "The Impact of Foreign Investment on Host Countries: A Review of the Empirical Evidence", Policy Research Paper, 1745, Washington DC: World Bank.

- Blomström, M., S. Globerman and A. Kokko (1999), "The Determinants of Host Country Spillovers From Foreign Direct Investment: Review and Synthesis of the Literature", Working Paper, 76.
- Bloom, D.E., R.B. Freeman and S.D. Korenman (1987), "The Labour-market Consequences of Generational Crowding", *European Journal of Population*, 3, pp. 131-76.
- Blundell, R. and S. Bond (1998), "Initial Conditions and Moment Restrictions in Dynamic Panel Data Models", *Journal of Econometrics*, 77, pp. 125-139.
- Borjas, G. J. (1993). "The Impact of Immigrants on Employment Opportunities of Natives", In; *The changing course of international migration*, pp. 191-198, Organization for Economic Cooperation and Development, Paris.
- Bornschieer, V. (1983), "World Economy, Level Development and Income Distribution: An Integration of Different Approaches to the Explanation of Income Inequality," *World Development*, 11, pp. 1-20.
- Bornschieer, V. and C. Chase-Dunn (1985), "Transnational Corporations and Underdevelopment", Praeger Press, New York.
- Bourguignon, F. (1990), "Growth and Inequality in the Dual Model of Development: The Role of Demand Factors", *Review of Economic Studies*, 57, pp. 215-228
- Brewer, T.L. and S. Young (1997), "Investment Incentives and the International Agenda", *World Economy*, 20, pp. 175-198.
- Bruno, M., M. Ravallion and L. Squire (1999), "Equity and Growth in Developing Countries: Old and New Perspectives on the Policy Issues, World Bank Policy Working Paper, 1563.
- Cavallo, M. (2005), "Government Consumption Expenditures and the Current Account", Federal Reserve Bank of San Francisco, Working paper, 3.
- Caves, R.E. (1974), "Multinational Firms, Competition, and Productivity in Host-Country Markets", *Economica*, 41, pp. 176-193.
- Chen, S. and M. Ravallion (2000), "How Did the World's Poorest Fare in the 1990s?", Policy Research Working Paper, 2409, Washington DC: World Bank.
- Coe, D.T., E. Helpman, and A.W. Hoffmaister, (1994), "North-South Research and Development Spillover", IMF Paper, 94, Washington DC: International Monetary Fund.
- Deininger, K. and L. Squire (1996), "A New Data Set Measuring Income Inequality", *World Bank Economic Review*, 10, pp. 565-591.
- Dollar, D. and A. Kraay, (2002), "Growth is Good for the Poor", *Journal of Economic Growth*, 7, pp. 195-225.

Dooley, M. and P. Gottschalk (1982), "Does a Younger Male Labour Force Mean Greater Earnings Inequality?", *Monthly Labour Review*, 105, pp. 42-46.

Easterly, W. and S. Fischer (2001), "Inflation and the Poor", *Journal of Money, Credit and Banking*, 1, pp. 159-178.

Edwards, S. (1990), "Capital Flows, Foreign Direct Investment, and Debt-Equity Swaps in Developing Countries", National Bureau of Economic Research, Working Paper, 3497.

Erosa, A. and G. Ventura (2000), "On Inflation as a Regressive Consumption Tax", University of Western Ontario.

Fosfuri, A., M. Motta and T. Ronde (2001), "Foreign Direct Investment and Spillovers Through Labourers Mobility", *Journal of International Economics*, 53, pp. 205-222.

Frankel, J.A. and D. Romer (1999), "Does Trade Cause Growth?", *American Economic Review*, 89, pp. 379-399.

Freebairn, D.K. (1995), "Did the Green Revolution Concentrate Incomes? A Quantative Study of Research Reports", *World development*, 23, pp. 265-279.

Freeman, R.B. and J.L. Medoff (1984), "What Do Unions Do?", New York: Basic Books.

Friedman, M. (1962), "Capitalism and Freedom", Chicago: University Chicago Press.

Galbraith, J.K. (1998), "Inequality and Unemployment: An Analysis Across Time and Countries", *Research on Economic Inequality*, 8.

Goldberg, L.S. and C.D. Kolstad (1994), "Foreign Direct Investment, Exchange Rate Variability and Demand Uncertainty", National Bureau of Economic Research, Working Paper Series, 4815.

Goldberg, L.S. and M.W. Klein (1997), "Foreign Direct Investment, Trade and Real Exchange Rate Linkages in Southeast Asia and Latin America", National Bureau of Economic Research, Working Paper Series, 6344.

Görg, H. and E. Strobl (2002), "Multinational Companies and Indigenous Development: An Empirical Analysis", *European Economic Review*, 46, pp. 1305-1322.

Greenaway, D., N. Sousa and K. Wakelin (2004), "Do Domestic Firms Learn to Export from Multinationals?", *European Journal of Political Economy*, 20, pp. 1027-1043.

Hanad, M., and A. Harrison (1993), "Are There Dynamic Externalities from Foreign Direct Investment?", In C.R. Frischtak and S.R. Newfarmer, "Market structure, and industrial performance", pp. 160-272, Boston: Routledge Kegan Paul.

Held, D., A. McGrew, D. Goldblatt and J. Perraton (1999), "Global Transformations: Politics, Economics, and Culture", California: Stanford University Press.

Howell, D.R. (1991), "Trends in the Growth and Distribution of Skills in the U.S. Workplace, 1960-1985", *Industrial and Labour Relations Review*, 44.

Irwin, D.A. and M. Terviö (2002), "Does Trade Raise Income?: Evidence From the Twentieth Century", *Journal of International Economics*, 58, pp. 1-18.

Iversen, T. (1998), "Wage Bargaining, Central Bank Independence, and the Real Effects of Money", *International Organization*, 52, pp. 469-504.

Jaffe, A.B. (1896), "Technological Opportunity and Spillovers of R&D: Evidence from Firms, Patents, Profits and Market Value", National Bureau of Economic Research, Working Paper, 1815.

Javorcik, B.S. (2004), "Does Foreign Direct Investment Increase the Productivity of Domestic Firms? In Search of Spillovers Through Backward Linkages", *American Economic Review*, 94, pp. 605-627.

Jenkins, R. (1996). "Theoretical Perspectives on the Transnational Corporation", In CR. Goddard, J T. Passe-Smith and JG. Conklin, "International Political Economy: State-market Relations in the Changing Global Order" pp. 439-459.

Johnson, W.R. (1985), "The Economics of Copying", *The Journal of Political Economy*, 93, pp. 158-174.

Johnston, B.F., J.W. Mellor (1996), "The Role of Agriculture in Economic Development", *Oxford Bulletin of Economics and Statistics*, 58.

Katz, L.F. and K.M. Murphy (1991), "Changes in Relative Wages, 1963-1987: Supply and Demand Factors" National Bureau of Economic Research, Working Paper, 3927.

Katz, L.F. and K.M. Murphy (1992), "Changes in Relative Wages: Supply and Demand Factors," *Quarterly Journal of Economics*, 107, pp. 35-78.

Klein, M.U., C. Aaron and B. Hadjimichael (2001), "Foreign Direct Investment and Poverty Reduction", World Bank Policy Research Working Paper, 2613.

Kokko, A., M. Zejan, and R. Tansini (2001), "Trade Regimes and Spillovers Effects of FDI: Evidence from Uruguay", *Weltwirtschaftliches Archiv*, 137, pp. 124-149.

Kravis, I. B. and R. E. Lipsey (1982), "The Location of Overseas Production and Production for Export by U. S. Multinational Firms", *Journal of International Economics*, 12, pp. 201-223.

Kurzer, P. (1993), "Business and Banking: Political Change and Economic Integration in Western Europe", New York: Cornell University Press.

Kuznets, S. (1955), "Economic Growth and Income Inequality", *American Economic Review*, 45, pp. 1-28.

Lall, S. (1980), "Vertical Interfirm Linkages in LDCs: an Empirical Study", *Oxford Bulletin of Economics and Statistics*, 42, pp. 203-226.

Lall, S. (1985), "Multinationals, Technology and Exports: Selected papers", New York: St. Martin's.

Lawrence, R. (1994), "Multinationals, Trade and Labour", National Bureau of Economic Research, Working Paper, 4836.

Leicht, K. (1989), "On the Estimation of Union Threat Effects", American Sociological Review, 54, pp. 1035-1045.

Levy F. and R.J. Murnane (1992), "U.S. Earnings Levels and Earnings Inequality: A Review of Recent Trends and Proposed Explanations", Journal of Economic Literature, 30, pp. 1333-1381.

Lipset, S.M. (1959), "Some Social Requisites of Democracy: Economic Development and Political Legitimacy", The American Political Science Review, 53, pp. 69-105.

Lipsey, R.E. (2002), "Home and Host Country Effects of FDI", National Bureau of Economic Research, Working Paper Series, 9293.

Lundberg, M. and L. Squire (2000), "The Simultaneous Evolution of Growth and Inequality." Mimeo, Washington DC: World Bank.

Manning, A. (1992), "Wage Bargaining and the Phillips Curve: The Identification and Specification of Aggregate Wage Equations", CEP Discussion Papers, 62, Centre for Economic Performance.

Markusen, J. and A. Venables (1999), "Foreign Direct Investment as a Catalyst for Industrial Development", European Economic Review, 43, pp. 335-356.

Matsuyama, K. (1991), "Agricultural Productivity, Comparative Advantage and Economic Growth", National Bureau of Economic Research, Working Paper, 3603.

Matouschek, N. (1999), "Foreign Direct Investment and Spillovers Through Backward Linkages", CEPR Discussion Paper, 2283.

Mincer J. (1989), "Human Capital Responses to Technological Change in the Labour Market.", Working paper, 3207, National Bureau of Economic Research, Cambridge.

Mincer, J. and S. Polachek (1974), "Family Investments in Human Capital: Earnings of Woman", Journal of Political Economy, 82, pp. 76-108.

Moser, P. (2003), "How Do Patent Laws Influence Innovation? Evidence from Nineteenth-Century World Fairs", National Bureau of Economic Research, Working Paper Series, 9909.

Muller, R. (1979). "The Multinational Corporation and the Underdevelopment of the Third World", In CK. Wilber, "The Political Economy of Development and Underdevelopment", pp. 151-178, New York: Random House.

Nafziger, W. (1997), "The Economics of Developing Countries", New Jersey: Prentice Hall.

- Ohlin, B (1933), "Interregional and International Trade", Harvard University Press, Cambridge, MA.
- Population Reference Bureau (2008), "World Population Data Sheet 2008", Washington.
- Reserve Bank India (2007), "RBI Bulletin February 2007: Foreign investment inflows", India.
- Robbins, D. (1996), "Evidence of Trade and Wages in the Developing World", OECD Development Center Technical Papers, 119.
- Rodrik, D. (1998), "Why do More Open Economies Have Bigger Governments?", *Journal of Political Economy*, 106, pp. 997-1031.
- Rosen, Sherwin, 1969), "Trade Union Power, Threat Effects and the Extent of Organization", *Review of Economic Studies*, 36(106), pp. 185-96.
- Rubinson R., (1976), "The World-Economy and the Distribution of Income Within States: A Cross-National Study", *American Sociological Review*, 41, pp. 638-659.
- Rumberger, R.W. (1987), "The impact of Surplus Schooling on Productivity and Earnings", *The Journal of Human Resources*, 22, pp. 24-49.
- Sachs J.D and A. Warner (1995), "Economic Reform and the Process of Global Integration", *Brookings Papers on Economic Activity*, 1, pp. 1-118.
- Saggi, K. (2002), "Trade, Foreign Direct Investment, and International Technology Transfer: a Survey", *The World Bank Research Observer*, 17, pp. 191-235.
- Schmitz, A. and J. Bieri (1972), "EEC Tariffs and U. S. Direct Investment", *European Economic Review*, 3, pp. 259-270.
- Sinani, E. and K.E. Meyer (2004), "Spillovers of Technology Transfer from FDI: the case of Estonia", *Journal of Comparative Economics*, 32, pp. 445-466.
- Spain, D. and S.M. Bianchi (1996), "Balancing act: Motherhood, Marriage, and Employment Among American Women", New York: Russel Sage Foundation.
- Stewart, B. (2004), "The Impact of the Introduction of the U.K. Minimum Wage on the Employment Probabilities of Low-Wage Labourers", *Journal of the European Economic Association*, 2, pp. 67-97.
- Subramaniana A. and S. Wei (2007), "The WTO Promotes Trade, Strongly But Unevenly", *Journal of International Economics*, 72, pp. 151-175.
- Summers, R. and A. Heston (1991). "The Penn World Table: An Expanded Set of International Comparisons, 1950-88." *Quarterly Journal of Economics*, 106, pp. 327-68.
- Taylor, J. (1993), "Discretion versus Policy Rules in Practice", *Carnegie-Rochester Conference Series on Public Policy*, 39, pp. 195-214.

UNCTAD (1996), "Incentives and Foreign Direct Investment", Current Studies, Series A, 30, New York and Geneva: United Nations.

UNCTAD (2006), "World Investment Report 2006; FDI from Developing and Transition Economies: Implications for Development", New York and Geneva: United Nations.

Vernon, R. (1971), "Sovereignty at Bay", New York: Basic Books.

Wang, J. and M. Blomström (1992), "Foreign Investment and Technology Transfer: a Simple Model", European Economic Review, 36, pp. 137-155.

Wheeler D. and A. Mody (1992), "International Investment Location Decisions: The Case for U.S. Firms", Journal of International Economics, 33, pp. 57-76.

Wood A. (1995), "How Trade Hurt Unskilled Labourers", The Journal of Economic Perspectives, 9, pp. 57-80.

Wood, A. (1997), "Openness and Wage Inequality in Developing Countries: The Latin American Challenge to East Asian Conventional Wisdom", World Bank Economic Review, 11, pp. 33-57.

World Bank, (2003), "World Development Report 2003: Sustainable Development in a Dynamic World".

World Bank, (2008), "World Development Report 2008: Agriculture for Development".

## Appendix A1: List of variables

All World Bank Data is taken from the WDI Online statistic database. Organisation for Economic Co-operation and Development Data, from the OECD statistic database and the other variables are taken from the Dollar and Kraay Dataset.

*Table 7: Variables included in the introduction.*

Variable	Explanation	Source(s)
FDI Inflow India	Foreign direct investment, inflow (BoP, current US\$)	Reserve Bank India (2007)
GINI coefficient India	Inequality measure; 0 representing total equality and 100 representing total inequality.	World Bank data

*Table 8: All variables included in the regression samples of chapter 6.*

Variable	Explanation	Source(s)
Arable land*	Arable land per capita, in hectares, divided by population aged 15-64. Average over five years up to and including indicated year.	World Bank data
FDI inflow	Foreign direct investment, net (BoP, current US\$)	Organisation for Economic Co-operation and Development Data, World Bank data
Government consumption*	Government consumption as share of GDP, current LCU, average over five years up to and including indicated year.	World Bank data
Income bottom quintile*	Log average incomes in bottom quintile, constant 1985 USD at PPP	World Bank data, UN-WIDER (2000), Deininger and Squire (1996), Ravallion and Chen (2000), Lundberg and Squire (2000)



Income inequality gap	Difference between overall income and income of the bottom quintile	World Bank data, UN-WIDER (2000), Deininger and Squire (1996), Ravallion and Chen (2000), Lundberg and Squire (2000)
Inflation*	Logarithm of 1+inflation rate, average over five years up to and including indicated year.	World Bank data
Openness index*	Exports Plus Imports as share of GDP, average over five years up to and including indicated year. All in constant 1985 USD at PPP	Summers and Heston Penn World Tables, World Bank data
Overall income*	Overall average per capita income, 1985 USD at PPP	Summers and Heston Penn World Tables, World Bank data
Primary education*	Average stock of years of primary education, average over five years up to and including indicated year.	Barro and Lee (2000)
Rule of law*	Rule of Law Index 1997-98, higher values indicate stronger rule of law, time invariant.	Kaufmann, Kraay and Zoido-Lobaton (1999)
Sachs-Warner dummy*	Sachs-Warner openness dummy, 1=Open, average over five years up to and including indicated year.	Sachs and Warner (1995)
Secondary education*	Average stock of years of secondary education, average over five years up to and including indicated year.	Barro and Lee (2000)
WTO/GATT dummy*	Dummy variable for membership in World Trade Organization/GATT, 1=member, average over five years up to and including indicated year.	WTO/GATT Data

*\*Taken from the Dollar and Kraay (2000) dataset*

## Appendix A2: List of countries

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### Definition developing countries by the OECD, IMF and the UN

There is no established convention for the designation of “developed” and “developing” countries or areas in the United Nations system. In common practice, Japan in Asia, Canada and the United States in northern America, Australia and New Zealand in Oceania and Europe are considered “developed” regions or areas. In international trade statistics, the Southern African Customs Union is also treated as developed region and Israel as a developed country; countries emerging from the former Yugoslavia are treated as developing countries; and countries of Eastern Europe and the former USSR countries in Europe are not included under either developed or developing regions.

*Table 9: All countries included in the regression sample of chapter 6.*

Developed countries		Developing countries	
1	Australia	1	Belarus
2	Belgium	2	Brazil
3	Canada	3	Chile
4	Denmark	4	China
5	Finland	5	Colombia
6	France	6	Costa Rica
7	Germany	7	Dominican Republic
8	Greece	8	Ecuador
9	Hungary	9	Ghana
10	Ireland	10	Honduras
11	Italy	11	India
12	Netherlands	12	Indonesia
13	New Zealand	13	Jordan
14	Norway	14	Korea
15	Poland	15	Sri Lanka
16	Portugal	16	Malaysia
17	Spain	17	Mauritius
18	Sweden	18	Mexico
19	Turkey	19	Nepal
20	United Kingdom	20	Nigeria
21	United States	21	Pakistan
		22	Philippines
		23	Slovenia
		24	Thailand
		25	Trinidad and Tobago
		26	Venezuela
		27	Zimbabwe

*Table 10: All countries included in the regression sample of paragraph 6.3.*

<b>Sachs-Warner countries</b>		<b>WTO/GATT member countries</b>	
1	Australia	1	Australia
2	Belgium	2	Belgium
3	Canada	3	Chile
4	Chile	4	Canada
5	Colombia*	5	Colombia
6	Costa Rica*	6	Costa Rica
7	Denmark	7	Denmark
8	Ecuador*	8	Dominican Republic
9	Spain	9	Spain
10	Finland	10	Finland
11	France	11	France
12	Germany	12	Germany
13	Greece	13	Ghana
14	Honduras*	14	Greece
15	Hungary*	15	Honduras*
16	Indonesia	16	India
17	Ireland	17	Indonesia
18	Italy	18	Ireland
19	Jordan*	19	Italy
20	Korea	20	Korea
21	Sri Lanka*	21	Sri Lanka
22	Mexico*	22	Mexico*
15	Malaysia	15	Malaysia
16	Netherlands	16	Nigeria
17	Norway	17	Netherlands
18	Nepal*	18	Norway
19	New Zealand*	19	New Zealand*
20	Pakistan*	20	Pakistan
21	Philippines*	21	Philippines
22	Poland*	22	Poland
23	Puerto Rico	23	Puerto Rico
24	Slovenia	24	Slovenia
25	Sweden	25	Sweden
26	Thailand	26	Thailand*
27	Turkey	27	Trinidad and Tobago
28	United Kingdom	28	Turkey
29	United States	29	United Kingdom
30	Venezuela*	30	United States
		31	Venezuela*
		32	Zimbabwe

*\*Not all observations of these countries are found to meet the set criteria. This means that some of the, mostly older, values are excluded. When change has occurred between observation points averages are used to calculate the dummy values. All other values are just equal to 1.*