Introduction and Overview

Since the Second World War the world has seen an economic growth spurt unprecedented in history. This accelerated growth was combined with a process of ever-increasing globalisation. Despite various problems associated with this process, it appears beyond contestation that considerable progress in material well-being and life expectancy has been achieved. Most people would agree that most of these gains were only achievable in a framework of strong economic performance. However, to consider economic growth as a goal in itself is misleading as it fails to capture the multidimensional nature of human development. Thus, economic growth is a necessary but not sufficient condition for improving human development, or in other words, economic growth is an important prerequisite for the ultimate goal of human well-being.

Therefore, it is not only important to analyse and understand economic growth per se, but rather the welfare impact or pro-poorness of economic growth. In particular, the past record shows that economic growth has been highly uneven between regions, countries and citizens. While some of the more fortunate managed to escape material poverty and low life expectancy, others remain in a devastating welfare situation even today. This is not only a tragedy for the individuals concerned, but also increasingly constitutes a global problem in an ever-more globalised world. In other words, in times of global communication and mass media, poverty is not only a socially unbearable situation, but fosters favourable conditions for environmental neglect, increased violence, including terrorism, and/or poverty-driven mass migration. Hence, a deeper understanding concerning the determinants, impact and distributive pattern of growth and its subsequent welfare implications, with respect to citizens, regions and/or countries, is of utmost importance in order to overcome some of globalisation’s challenges and poverty in general. This dissertation contributes four empirical essays, analyzing growth, poverty and inequality dynamics at the macro and micro level.

On a purely quantitative note, if anything, economic growth is a rough guide for the dynamic development of an economy and its well-being. Hence, it is unsurprising that, starting from the early 1990s, with increasing data availability and processing power, economists turned towards analysing countries’ growth records and cross-country growth regressions. From basic visual inspection alone it is apparent that, firstly, South East Asia has been growing remarkably fast, closing the income gap to the rich countries and, secondly, that Sub-Saharan Africa has mostly been economically stagnating over the past decades. Hence, the first impression is that
most Sub-Saharan African nations' economic growth record is characterised by the persistence of low income and low growth equilibria, which implies a relative economic retardation in relation to the OECD countries. In contrast, most South East Asian nations' economic growth record was sufficiently good to facilitate an income catch-up towards the rich countries' high income and medium growth equilibria. However, whether this is the case, the global cross-national distribution of income should display at least two, or even more, distinct components. This in turn would imply the need for policy intervention to move nations from a low income and low growth equilibrium towards a self-sustaining fast growth trajectory, allowing an income catch-up to the richer countries. Hence, the question, whether past economic growth has led to an income per capita convergence among all countries has received much attention in the recent literature. Several recent papers (Jones, 1997; Quah, 1996a, b; Sala-i-Martin, 1996; Beaudry et al., 2005) have this debate at heart and discuss which type of convergence governs the development of the cross-national per capita income distribution and what is to be expected in the future. Bianchi (1997) is the first to formally test for multimodality of the cross-national income distribution based on Kernel density estimates and finds increasing evidence of bimodality implying a polarisation of the global cross-national income distribution.

The first essay of this dissertation, based on joint work with Hajo Holzmann and Sebastian Vollmer, adds to this debate. One major limitation of the previous academic papers is that the income data is analysed non-parametrically and based on a logarithmic scale which entails the problem that the number of modes of a density strongly depends on the scale chosen. Hence, our paper models the cross-national income distribution as a mixture in which the number of components is independent of the scale chosen, as it is not the number of modes in the cross-national income density which contains the most relevant information, but rather the number of components or "convergence clubs". Thus, speaking in statistical terms, the number of components in a mixture model provides key information on convergence. In order to identify the number of components, we applied the recently developed modified likelihood ratio test methodology (cf. Chen et al. 2001, 2004, and Chen and Kalbfleisch, 2005) on the cross-national per capita income distribution and find the emergence and divergence of a third clearly distinct component by the mid 1970s. This allows us to contribute to the convergence debate by extensively investigating the evolution and, in particular, the intra-distributional dynamics of the cross-country income distribution by using posterior probability estimates from our fitted model. We find intra-distributional dynamics in particular for the Asian (upward mobility) and the Latin-American (downward mobility) countries, while most Sub-Saharan African countries remain stuck in the lowest component. The overall picture that we obtain is that of three diverging groups in the cross-national income distribution. Hence, we must strongly reject the notion that the cross-national per capita income distribution is converging. Moreover, we are the first to suggest that the cross-national per capita income distribution is not strictly polarising (the alleged "twin peaks" Quah, 1996; Bianchi, 1997), but that there are three distinct different "clubs" from 1976 onwards.
INTRODUCTION AND OVERVIEW

However, our cross-country income per capita analysis also shows very clearly that particular populous countries managed to grow fast enough to facilitate an income catch-up to the richest countries over the past 40 years. This leads to an equally interesting question, from a global welfare point of view. Namely: Is the global income distribution converging and what was the global participatory and distributional impact of past growth on global poverty rates and inequality measures? Current research is focusing ever more closely on the participatory and distributive nature of growth. Furthermore, a better understanding of the participatory nature of growth, as well as its determinants, is also clearly important if the world is to meet its Millennium Development Goals (MDGs) of halving global poverty and hunger by 2015. A number of recent papers (Dowrick & Akmal, 2005; Milanovic, 2002; Chen & Ravallion, 2004; Chotikapanich, Valenzuela & Rao, 1997; Bourguignon & Morrisson, 2002; Quah 2002; Bhalla, 2002; Sala-i-Martin, 2002a, 2006) used two basic methodological approaches to model a global income distribution in order to draw conclusions concerning the development of global poverty and inequality. Both combine population weighted national average income and distribution estimates in order to derive a global income distribution.

The second essay, based also on joint work with Hajo Holzmann and Sebastian Vollmer, contributes to the existing and ongoing research. We implement the method of a parametric mixed lognormal distribution on national account income data and household-based income distribution measures. In particular, the paper highlights the fact that this parametric mixed lognormal approach has many statistically desirable properties and displays practical advantages to analyse the question at hand. Furthermore, we introduce recently developed methodologies and concepts such as growth incidence curves and rates of pro-poor growth (Ravallion and Chen, 2003; Ravallion, 2004) on a global scale to analyse the participatory and distributional impact of past global growth on the global poverty headcount and inequality via semi-decade and region specific growth incidence curves. Moreover, we calculate a decomposed Theil's measure of inequality, which allows for a decomposition of global income inequality into a between and within country component. Our results indicate that even though the cross-national income per capita distribution is not converging as concluded in the first essay, it is clearly the case that the global income distribution is indeed converging. This global income convergence is characterised by a rapid and dramatic decline in poverty headcount rates, not only reducing the relative but also the absolute number of people globally living below the poverty line. Moreover, our Theil's inequality decomposition shows that, while global income inequality is declining, this reduction is due to the decrease of between country inequality, which is counteracted by a slight increase of within country income inequality. Furthermore, the analysis of growth incidence curves shows the bottom-middle part of the income distribution experienced above average percentile growth rates, which explains the occurring global income convergence. In particular, the late 1970s and

Note: The global income distribution is the distribution of every persons' income on this planet and thus the suitable measure to answer questions concerning global welfare. Moreover, it is not equal to the distribution of cross-country income per capita which models the distribution of average per capita income in which the observation of Luxemburg is treated equally to China's.
early 1980s are characterised by high global rates of pro-poor growth, initiating the rapid decline of global poverty rates.

Unsurprisingly, it is mostly the success of the East Asian region with the population heavy weight China, and to a lesser extent the success of South Asia, which includes India, that drives these remarkable results and high rates of pro-poor growth. In comparison, the initially rather wealthy regions of Latin America and the Caribbean and the Middle East and North Africa remained rather stagnant on a high level contributing only very modestly to the global poverty dynamics. Lastly, Sub-Saharan Africa has remained virtually stagnant and has become the poorest region in relative and absolute terms, implying a steady divergence and disconnection from the global growth process. Thus, despite the fact that our results indicate a tremendous success in economic growth and connected social welfare gains on a global scale over the past decades, the remaining very lowest percentiles also experienced the lowest percentile income growth rates, such that the remaining extreme poor might be particularly hard to reach. This is likely due to the fact that those remaining poor are mostly citizens of countries whose economies are stuck in a low level income equilibrium and thus fail to connect to the global growth process. However, poverty also remains a pressing issue in many countries which managed to launch their economies on a successful growth trajectory, but which have remaining pockets of poverty, in particular in rural areas, within their national boundaries. Thus, any attempt to reduce global poverty even further must focus on those countries stuck in general national poverty traps and on remaining, in particular rural, national pockets of poverty. The regional decomposition of growth suggest that countries and regions which managed to participate the most in the process of globalisation, managed to reduce poverty the fastest, despite the considerable problems inherent in such a process.

Given the stylised fact of a diverging cross-national per capita income distribution, as analysed in detail in the first essay, the question remains: what determines different income per capita growth rates that enable some countries to thrive, while others remain economically stagnant? Following pioneering work by Mankiw, Romer and Weil (1992) and Barro (1991), many different growth regressions with multiple specifications and covariates in a cross-country deterministic neo-classical growth framework were formulated in order to explain this diverging growth experience. The main initial findings are, firstly, that much of the world-wide growth variation can be explained remarkably well by the variables specified in the theoretical Solow growth model. Secondly, however, it became equally clear that there is a sizeable unexplained residual accounting for a wide heterogeneous experience between different countries and regions. In particular, Sub-Saharan Africa's growth tragedy could be hardly explained by the plain cumulative parameters of the Solow growth model alone. Hence, main "groups" of determinants are identified in the literature which account for, or are associated with, factor accumulation and/or differences in productivity levels. One set of growth determinants stress the unfavourable geographic conditions (e.g. Sachs and Warner 1994) such as tropical climate, and the implied endemic disease environment, or the lack of access to the sea, and the implied higher cost of
trade participation. Closely connected are determinants which measure the impact of openness and/or trade on growth (Frankle and Romer, 1999). This in turn is also closely associated with the institutionalists' point of view that highlights more the importance of historical development trajectories, man made institutions, human capital accumulation and good governance as prerequisite for efficient resource allocation and public good provision (e.g. Acemoglu et al., 2001, Englebert, 2000). More recently the debate has shifted beyond the mere accumulation of factors of production towards determinants of different productivity levels (e.g. Feyrer, 2007).

The paper by Easterly and Levine (1997) argues that Sub-Saharan Africa's worse than average growth performance is mainly due to a high degree of ethno-linguistic fractionalisation and a resulting adverse policy climate. The paper concludes that "the results lend support to theories that interest group polarisation leads to rent-seeking behavior and reduces the consensus for public goods, creating long-run growth tragedies".\(^2\) The paper by Alesina et al. (2003) improves the argument by creating and testing three new indices of ethnic fractionalisation, namely linguistic, religious and ethnic fragmentation. It shows that the linguistic and ethnic indices have a similarly negative impact on the policy environment and subsequently on growth in a cross-country growth regression. Furthermore, Easterly (2001a) showed that the negative effect of ethnic fractionalisation is mitigated by institutional quality. Moreover, in a second paper Easterly (2001b) argues that the "middle class consensus", or the lack of strong ethnic or class differences, results in the highest growth rates. However, the channels through which ethnic fractionalisation has a negative impact on growth have been analysed only partially by these studies. Furthermore, the impact of ethnic fractionalisation on economic progress might be far more complex than the existing empirical studies would suggest. For this reason the third essay intends to extend the existing analyses.

The third essay, based on joint work with Dana Schüler, adds to this large growth deterministic research by firstly updating the regression framework data set used by Alesina et al. (2003) into the 1990s in order to analyse the robustness of their results in a wider time range. The results indicate that their initial model specification yields different results once the 1990s are included, as the negative effect of ethnic fractionalisation remains substantial and statistically significant even after the inclusion of policy variables. Hence, we apply region specific regressions, as well as a region and decade specific ethnic fractionalisation interaction term, in order to identify whether this result is driven by a decade or region-specific effect. Our results indicate that the model specifications, accounting for the impact of ethnic fractionalisation on growth via policy variables alone, as in the Alesina et al. (2003) model, are incomplete, as they fail to fully account for the recent Sub-Saharan growth experience. One plausible reason would be the increased frequency and severity of ethnic conflicts, in particular in Sub-Saharan Africa, after the collapse of the balance of superpowers. Another reason might be the increased importance of good governance which is not captured sufficiently in the policy variables used so far. A further different reason

would be that the implied channels of ethnic fractionalisation on growth cannot be completely confirmed, suggesting that other channels which have not yet been accounted for are equally or more important. We find that the growth-hampering impact of ethnic fractionalisation remains only in the 1990s and in Sub-Saharan Africa once the policy framework is controlled for. In the end our results show that this Sub-Saharan 1990s effect can be explained by different levels of governance in the 1990s, if we implement the Kaufman-Kraay-Zoido-Lobaton-Indicator as measurement for governance. However, we cannot confirm the hypothesis that the remaining negative impact of ethnic fractionalisation is due to violent conflict.

In addition, it might be the case that the alleged negative effect of ethnic fractionalisation on growth described above is mitigated by possible positive effect prevailing in multi-ethnic societies. In particular, there is a large body of literature which suggests that the existence of co-ethnic networks has a large positive impact on trade and thus growth. The theoretical argument is, that immigrants have an informational and trust advantage in arranging trade with their home countries over their local counterparts (Epstein and Gang (2004), Casella and Rauch (1997), Rauch (2001)). Hence, we empirically investigate, if ethnic fractionalisation might be positive in a nation which is ethnically diverse, partially due to past immigration. We find some indication that countries which are ethnically diverse due to past immigration can mitigate the negative impact of ethnic fractionalisation on growth. We distinguish between these two different kinds of ethnic fractionalisation in order to determine if the result empirically indicates this multidimensionality of ethnic diversity.

In summary, this third essay shows that ethnic divide remains an explanatory factor for diverging growth records in Sub-Saharan Africa and Latin America even after the inclusion of the 1990s data and policy control variables. Furthermore, it demonstrates that ethnic diversity is not necessarily growth hampering, but contrarily can be growth enhancing if ethnic diversity today is the result of free past immigration and subsequent resulting trade networks. However, this kind of ethnic diversity is not currently present in most developing countries. Hence, in particular nations in Sub-Saharan Africa seem to be trapped in a situation of low income, low growth and high ethnic divide. However, it is highly likely that the ethnic divide often goes along with high inequality and interest group polarisation; the implication would be to improve equal access to resources, political participation and, in particular, human capital. This situation might indeed characterise one of multiple possible low income and low growth, high poverty equilibria mentioned above. High income and human capital inequality can have two consequences. Firstly, it could have a direct negative effect on growth. Secondly, it could prevent the poor from participating in the growth process. Thus, a strand of research, including the second essay of this dissertation, has concentrated more strongly on the participatory and distributive nature of growth on various levels ranging from micro household community to global data analysis. The second essay argues that the largest part of the remaining poor of the global income distribution are to be found either in poor countries or in the poorest percentiles or national pockets of poverty in the intermediate, particular populous and regionally diverse income countries. In fact,
as mentioned above, it might be the case that certain, mainly rural, provinces in intermediate countries suffer from very similar growth hampering factors as economically poor performing developing countries.

More specifically, it is very clear that the vast majority of the world's poor remain in the countryside engaged in low productivity, mainly agricultural activities. Hence, recent and current research is aiming to identify and understand the determinants of rural income growth and poverty reduction from a regional to micro level. One theme of recent and past literature argues that from an empirical point of view growth originating in the agricultural sector has tended to be more "pro-poor" than growth originating from the industrial or service sectors (Mellor, 1976; Ravallion and Datt, 1996; Ravallion and Chen, 2004; Timmer, 2002). Indeed, agricultural growth has often been an important ingredient in the formula that connects economic growth to the poor (Ravallion and Huppi, 1991; Ravallion and Datt, 1996; Ravallion and Chen, 2004; Sumarto and Suryahadi, 2003; Fan, Zhang and Zhang, 2004; Fan, Thorat and Rao, 2004; Timmer, 1997, 2004) and separate reviews by Thirlle, et al. (2003) and by Majid (2004) confirm the strong empirical link between higher agricultural productivity and poverty reduction. Moreover, the current interest in this topic is well documented by the forthcoming World Development Report "Agriculture for Development" (2008).

However, an equally important and connected debate is concerned with the role of rural non-farm activities in rural income growth and rapid poverty alleviation. This is particularly true, as in most developing countries rural non-farm output accounts for roughly half of rural income. Non-farm activities can be most conducive towards poverty reduction, especially in the absence of physical infrastructure and human capital constraints (Datt and Ravallion, 1996, 1998a&b, 2002a). Moreover, rural non-farm enterprises are likely to be pro-poor, as they tend to use factors of production at their real opportunity costs to the economy, so they are often labour-intensive in nature, reducing underemployment, help smooth income seasonally and bid up local wages (Lanjouw and Lanjouw, 2001).

These literatures on rural poverty reduction are bridged in a broader literature which attempts to understand the nature of pro-poor growth, which inevitably must encompass the rural poor and their potential pathways out of poverty (Ravallion 2004, World Bank, 2004a, 2006b). In other words, is agriculture productivity the main driver behind rural poverty alleviation? Moreover, do non-farm enterprises encompass predominantly low productivity, supplementary and insurance activities or are they a potential source of dynamic growth and poverty alleviation in rural areas? Most of the literature suggests that productivity gains in both, agriculture and non-farm activities, matter and that non-farm activities fulfil both important functions. However, to answer these questions ultimately necessitates an empirical approach.

The last paper of this dissertation adds to this debate by utilising, among other things, micro-growth regressions on Indonesian household survey panel data (IFLS 1993, 2002) in order to identify the determinants of growth and poverty reduction, or pathways out of poverty, in Indonesia. This detailed micro-study is based on work with Neil McCulloch and Peter Timmer, and
was conceived as an academic background paper to the World Bank's rural investment climate assessment in Indonesia in 2005. The main findings are that urbanisation has been rapid, but only a small part is due to actual physical migration of workers and households while most is due to local economic agglomeration and subsequent re-classification of former rural areas. Furthermore, while the non-farm sector plays an important and dynamic role in facilitating growth and alleviating poverty, it is equally important to foster agriculture productivity increases as most of the poor are living from agriculture and managed to leave poverty while remaining in agriculture. Moreover, we confirm the importance of education or human capital in poverty reduction as it allows the poor to participate in high productivity activities in general and increases the chance of a successful sectoral or locational change. The absence of human capital endowment might indeed constitute an individual poverty trap or low income, low growth equilibrium. Hence, the persistence of low income and low growth equilibria or poverty traps might again be due to limiting geographic, institutional and/or educational factors.

This, in turn connects to the three essays before, as it shows how the global analysis and conclusions of growth, poverty and inequality patterns might be also applicable and even determined on a micro-level. As it might well be the case that rural poor regions, just like countries stuck in poverty traps, suffer from very similar structural weaknesses, which hamper their growth potential and disconnect them from the global growth process. In simplified words, an individual who lacks crucial factor endowments might find it particularly hard to shift occupation or to profit from specialisation and thus to improve his productivity and income. The same argument can be made for national economies. Thus, fair integration into the global economy and equitable human capital accumulation should be the best guarantee to strengthen pro-poor growth of structurally weak economies, national pockets of poverty and individuals. This will reduce global poverty and inequality even further, assuring that the global community reaches the targeted MDGs.

The four empirical essays of this dissertation add to the general debate about this dynamics of growth, poverty and inequality over the past 40 years in four different dimensions. The first paper analyses the dynamics of the cross-country per capita income distribution and the existence of convergence clubs. Moreover, the second paper analyses the dynamic development of the global income distribution and the implications for global income convergence, poverty reduction and the evolution of global inequality within and between countries. Furthermore, the third essay contributes to the understanding of growth determinants in a macro cross-country regression framework. Finally, the fourth paper adds to the understanding of micro determinants of growth and poverty in a national setting, among others, in a micro growth regression framework.