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Essays on the Evolution of Inequality

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ESSAYS ON THE EVOLUTION OF INEQUALITY

A Dissertation Presented

by

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In the memory of my grandmothers Mühibe Oyvat and Güngör Özen

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ABSTRACT

ESSAYS ON THE EVOLUTION OF INEQUALITY

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This dissertation examines the evolution of inequality during the development process. Specifically, the study will focus on two factors that crucially influence the evolution of distribution: 1) industrialization and urbanization, and 2) agrarian structures and land inequality. The dissertation consists of three essays: The first essay examines the impact of the initial conditions of agrarian structures on income inequality over the long run. It develops a model showing that at the same level of national income, countries with more unequal land distribution can be expected to experience greater agglomeration in the urban sector. The excess labor in the urban sector of these countries is added to the subsistence sector that functions as a reserve army of labor and lowers wage shares in the urban capitalist sector. Hence, higher land inequality also increases urban income inequality. The essay's theoretical model is also supported by an empirical analysis that finds that the level of pre-urbanization land inequality has a significant impact on determining today's income inequality.

The second essay applies the theoretical arguments developed in the first essay, by means of a comparative analysis of the relationship between land and income inequality in Turkey,

Korea, and Brazil. The essay evaluates the existing literature on the impact of agrarian structure on Turkey's income distribution. Turkey is compared with two extreme cases: Brazil, which historically has a very inegalitarian agrarian structure, and Korea, which experienced a very redistributive land reform following World War II.

The third essay examines the validity of the Kuznets hypothesis. Unlike the majority of the literature on the Kuznets Curve, this essay first scrutinizes the arguments suggested in Kuznets's own work. The essay focuses on three aspects: a) changing weights of sectors, b) informal employment, and c) education inequality. Panel data techniques are also used to empirically test the validity of the mechanisms that might lead to an inverted-U relationship between income and inequality.

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CHAPTER 1

INTRODUCTION

This three-essay dissertation examines the impact of prior land distribution and economic development on the levels of income inequality experienced during and after urbanization and industrialization. Income distribution is influenced by a wide variety of institutional factors and policy choices, including tax policies, education and healthcare investments, changes in the labor standards, strength of unions, trade openness, financial liberalization, and subsidization in the rural sector. I argue that a thorough analysis of income distribution in developing nations must include a consideration of earlier patterns of land distribution and how income inequality changes in different phases of industrialization.

As supported by previous empirical work, there is a strong relationship between land and income inequality (Carter, 2000; Bourguignon and Morrisson, 1998; Easterly, 2007). Countries with inegalitarian land distribution are also countries with large income inequalities even when their economies are dominated by the urban sector. We also have good reasons to believe that income inequality increases as GDP per capita rises. According to estimates of Alwyn Young (2013), 40% of total inequality in developing countries is explained by the urban-rural gap and 19% is explained by educational inequality. These structural characteristics would certainly change following economic growth, which would have secondary effects on income inequality in developing countries.

1.1 Questions to answer

This dissertation aims to answer two sets of questions regarding structural causes of income inequality in developing economies. These can be summarized as:

1) Why is there a categorical difference between the income distributions in different regions? Why do Latin American or Southern African countries have income inequalities

higher than the countries in East Asia or the Middle East? Is this regional difference just a coincidence or does it result from similar initial conditions of development?

2) Why are income Gini coefficients generally higher in developing countries than in even the most unequal developed nations?[1] *Does economic growth generate rising income inequality? Or did only more equal countries become "developed"?*

In response to the first set of questions, this dissertation argues that countries with similar levels of income inequality during development began with similar agrarian structures. Initial conditions of development do seem to have long run effects. There are several theses on the roots of the initial agrarian structures and pre-urbanization inequality. Engerman and Sokoloff (2002) argue that climate and soil quality affected the evolution of inequality, since they determined the set of crops that would be cultivated on the land. They claim that commercial crops like sugar are usually produced in large-scale plantations; whereas, the production of food crops like grains are more associated with the small independent family farms. Following this, Engerman and Sokoloff suggest that, the difference between agrarian structures naturally led to greater land inequality in the sugar-producer areas and lower land inequality in the grain-producer areas[2].

Another perspective on the historical roots of inequality focuses on "colonial origins of inequality". Acemoğlu, Johnson and Robinson (2001; 2002) claim that the institutions formed in the colonies with smaller settler populations are more likely to be designed to expropriate resources and surplus. The highly hierarchical institutional structure formed in these countries lead to a greater distinction between native and colonizer populations, and hence an inegalitarian structure. According to Acemoğlu, Johnson and Robinson, the share of settler population in the colonies is either dependent on the endemic diseases preventing the settlements of Europeans or the colonized country's initial population density.

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[1] According to the dataset used in the fourth chapter, for the period 2005-2010 the median income inequality observation (0.299) among developed nations is lower than all of the income Gini coefficients in the developing sample. Even the highest Gini coefficient (0.47) in the developed sample is still than 64.5% of income Gini coefficient observations in the developing sample.

[2] The hypothesis of Engerman and Sokoloff is also supported by the empirical study of Easterly (2007), which finds a strong correlation between income inequality and the ratio of the production of wheat and sugar.

One or maybe all of the factors mentioned above might explain the land inequalities before industrialization. In any case, both historical studies (Engerman and Sokoloff, 2005) and the previous empirical evidence (Carter, 2000; Bourguignon and Morrisson, 1998; Easterly, 2007) show that initial conditions in agriculture are very influential in determining current levels of income inequality. The mainstream economics literature explains the relationship between land and income inequality by the means of the intermediate link of education and resulting differences in worker productivity. Several studies (Galor and Zeira, 1993; Galor and Zeira, 1996; Galor and Tsiddon, 1996; Galor, Moav and Vollrath, 2009; Bourguignon and Verdier, 2000) argue that land inequality can influence educational opportunities, which later creates skill gaps between individuals. Indeed, there are cases of developing economies such as Korea and Taiwan in which lower inequality helped the expansion of the education frontier (Griffin and Ickowitz, 1998; Voitchovsky, 2011).

The education linkage is very incomplete, as it dismisses other aspects of class relations within the urban sector. This dissertation contributes the literature by focusing on land inequality's impact on class relations and wage bargaining in the emerging urban sector. In countries with greater land inequality, a large share of the rural population migrates to the urban areas. However, the growth in the urban sector typically cannot create sufficient productive jobs. Therefore, in the "overurbanized" economies, a larger share of the urban population becomes a part of the urban subsistence sector, piecing together a livelihood through informal and/or irregular activities. Those subsisting on these activities later serve as an urban reserve army of labor and suppress wages in the urban capitalist activities.

Land inequality's wage bargaining effect has been mentioned in studies whose focus is not the relationship between land and income distribution (Griffin, Khan and Ickowitz, 2002), and in several case studies on Latin America (De Janvry, 1981; Harris, 1978), Korea (Amsden, 1989; 1990) and Turkey (Keyder, 1987). This dissertation first organizes and formalizes this idea by developing a theoretical model based on the assumption that the rural-to-urban migration is shaped by the expected urban and rural incomes. The theoretical model clarifies the points in the existing literature that might create confusion. For instance, Keyder (1987) in his influential work "State and Class in Turkey" claims that the dominance of the small peasantry in Turkey "exerted an upward pressure on urban wages".

Gürel (2011) criticized Keyder on this point and argued instead that the Turkish agrarian structure is a type that puts downward pressure on wages rather than the type that exerts upward pressure on wages.

By benefiting from model, I show that Gürel's classification of two types of agrarian structures is artificially restrictive. Indeed, even the most egalitarian land distribution cannot reduce urban inequality, since the existence of "unlimited supplies of labor" still puts downward pressure on urban wages. Nevertheless, the model presented here demonstrates that negative impact of urbanization on urban wages can be less in the countries with more equal land distribution. In countries with higher land inequalities the expected income for the average rural dweller is low, which encourages rural-to-urban migration even in the cases where there isn't sufficient labor demand in the urban capitalist sector. This feeds the growth of population in the urban subsistence activities that serves as a reserve army of labor in the urban capitalist sector. Hence, unequal land distribution is also transmitted to the distribution in the urban sector.

The main limitation of my model is that it is less useful on explaining the cross-country differences between the countries that have significantly different long-run growth rates. The model does not focus on land inequality's impact on capital accumulation. Land inequality influences various factors like profit shares (Goodwin, 1967; Skott, 1989), utilization rates (Marglin and Bhaduri, 1990), crime rates, corruption, social unrest, development of human capital (Griffin and Ickowitz, 1998; Voitchovsky, 2011) and agricultural productivity (Vollrath, 2007). These factors interact in unpredictable ways to determine long-run growth, a process my model does not attempt to predict or explain.

I support the central arguments regarding land distribution and income inequality developed in the theoretical model with both an empirical analysis and a comparative case study on Korea, Turkey and Brazil. The empirical analysis examines the significance of the urbanization channel suggested in the model. First, the analysis tests the influence of land inequality circa 1960s on today's urban and overall income inequalities. Next, the analysis tests whether higher land inequality leads to overurbanization. Last, the analysis tests the role of urbanization on determining the cross-country differences of income inequality. The empirical analysis controls for GDP per capita and institutional factors like

education inequality and the level of democracy. The results show that the urbanization channel explains cross-country differences of income inequality better than the education channel.

The comparative case study analysis on Turkey, Korea and Brazil highlights the trajectory of land reform and other institutional changes that bear on income inequality. The expansion of education in Korea accelerated following the progressive land reform after World War II, (Fields and Yoo, 2000) and the returns to education were at all levels smaller in Korea than in Brazil (Park, Ross and Sabot, 1996), all of which helped to reduce income inequality. Korea's progressive land reform helped to moderate income inequality in part through the channel of education.

Wegenast (2010) for Brazil and this dissertation for Turkey empirically show that the regions with higher land inequality also have lower education investments and enrollment rates. Nevertheless, the education channel cannot explain why income inequality in Brazil is higher than in Turkey. Indeed, the dissertation shows that Brazil succeeded as well as Turkey in expanding education. However, Brazil is more overurbanized than Turkey, which left Brazil with a larger reserve army of labor - a larger share of informal and/or subsistence and/or irregular employment within the nonagricultural sector. This made income inequality in Brazil higher than in Turkey.

The second set of questions that this dissertation aims to answer are derived from the famous Kuznets hypothesis - the inverted-U relationship between income per capita and income inequality. Unlike the majority of the literature on the Kuznets Curve, this essay first scrutinizes the arguments suggested in Kuznets's own work by focusing on three aspects: changing weights of sectors, informal employment and educational inequality. These aspects are preferred considering that Kuznets (1955) in "Economic Growth and Income Inequality" explains the inverted-U relationship between income per capita and distribution through changing sectoral weights, urban-rural gaps and the social mobility between rural-to-urban migrants and urban dwellers living in cities for a longer period. Urban/rural value added and employment shares are important parts of Kuznets's analysis. Societies with smaller education gaps and smaller informal sector have more homogeneous labor markets. Therefore, I use nonagricultural informal employment and education inequalities as proxies

to gauge the divide between recent rural-to-urban migrants and established urban dwellers. Significant shifts in sectoral shares, informal employment or the education frontier are not characteristics of a developed, mature economy. Therefore, I argue that the Kuznets hypothesis can only hold in developing economies. The specific characteristics of developed countries are discussed in the fourth chapter in detail. As the characteristics of developing country converge to those of a developed economy, the mechanisms mentioned by Kuznets become weaker.

The contribution of this essay is that it empirically tests the validity of the mechanisms suggested by Kuznets using panel data techniques and a cross-country dataset. The results of the analysis support the claim that that income per capita affects income inequality through sectoral shares and informal employment. However, the evidence is weaker on income per capita's influence through education inequality.

1.2 The plan for the dissertation

The plan for this dissertation is as follows. The second chapter presents the theoretical arguments concerning the relationship between land and income inequality. Based on the framework in the chapter, a theoretical model is developed, rooted in the Harris-Todaro (1970) migration model, which shows land inequality's impact on income inequality through urbanization. Last, the chapter presents a cross-country analysis testing the mechanism proposed in the theoretical model.

The third chapter is a comparative analysis illustrating how land inequality helps explain differences in income inequality in Turkey, Brazil and Korea. This chapter first discusses the characteristics of agrarian structures and income inequality in Turkey, Brazil and Korea. Then I trace the possible influence of the prior agrarian structure on the path of income inequality during development. The argument is also tested with an econometric model.

The fourth chapter discusses and tests the Kuznets hypothesis. It first analyzes the mechanisms through which rising per capita income might magnify income inequality. Next, it empirically tests the Kuznets hypothesis and whether the mechanisms –urban-rural divide, informal employment and education inequality– are the reasons behind the possible

Kuznets Curves. Last, the fifth chapter summarizes the outcomes of this dissertation and concludes.

CHAPTER 2

AGRARIAN STRUCTURES, URBANIZATION AND INEQUALITY

2.1 Introduction

Land distribution is not only about the welfare of rural dwellers. Indeed, land distribution can partially explain differences in income inequality even in urbanized societies. This is because land inequality can influence the urban and overall national income distribution through its effects on institutions and labor bargaining relations within the urban sector. The long-run effects may continue even as the country becomes an urbanized society.

The impact of land inequality on urban distribution has been examined in several prior studies (Engerman and Sokoloff, 2002; 2005; Galor and Zeira, 1993; Galor and Tsiddon, 1996; Galor, Moav and Vollrath, 2009; Bourguignon and Verdier, 2000; Frankema, 2009; Wegenast, 2009). These studies focus on institutions, pointing out in particular that greater wealth inequality would lead to institutions that bias education capabilities and policies against the poor. This would result in the transmission of land inequality to urban inequality.

The contribution of this chapter is an analysis of the impact of land inequality on class relations and wage bargaining in the urban sector. Consistent with the Harris-Todaro (1970) framework, I assume that the difference between expected urban incomes and rural incomes determines the migration decision. The fallback position of the new urban dwellers thus is formed by the previous rural incomes. As in the Lewis (1954) model, the rural-to-urban migration suppresses wages in the urban sector. In countries with higher land inequality, more migrants are willing to move to the urban sector for lower wages, and the migration process therefore has a more pronounced negative impact on the urban wages.

The wage-bargaining effect of land distribution has been relatively ignored in the existing literature. It is mentioned in a few paragraphs in empirical studies examining the relationship between land and income inequality, in studies whose focus is not on the link

between land and urban distribution (Griffin, Khan and Ickowitz, 2002) and in case studies (De Janvry, 1981; Harris, 1978; Keyder, 1987, Amsden, 1989; 1990) of selected regions. Building on these earlier insights, this study offers a thorough theoretical analysis by developing a model based on the Harris-Todaro (1970) framework as extended by Fields (1975, 2005). The model is then tested in an empirical analysis that examines whether the wage-bargaining effect is relevant even when we control for the education gap and other institutional variables.

As land distribution and urban inequality are closely connected, the implications of this paper are also important for understanding long-run development paths. Inequality often creates impediments to long-run growth. Unequal income distribution has been shown to limit educational opportunities for the poor and/or middle classes, elevate credit constraint problems, decrease domestic demand, increase crime rates and corruption, lead to social unrest in the society and pull down per capita income and educational attainment through higher rates of fertility (Griffin and Ickowitz, 1998; Voitchovsky, 2011). In addition, inegalitarian agrarian structures can lead to lower land productivity (Vollrath, 2007)[1]. A wide range of empirical work (e.g. Easterly, 2007; Alesina and Rodrik; 1994; Deininger and Squire, 1998) confirms that the countries with historically more egalitarian distribution enjoyed greater rates of growth in the second half of the 20th century. In a world where 48 % of the population still lives in rural areas (World Bank, 2012), our results provide support for agrarian policies favoring egalitarian landownership.

The chapter proceeds as follows. The next section examines the simple correlation between income inequality and land inequality across dozens of countries. The third section develops the theoretical framework that links the two. The fourth section provides a simple model of the relationships among urbanization, income and land distribution. The fifth section presents an econometric test of the theory, and the last section concludes.

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[1]In a cross-country analysis, Vollrath (2007) empirically finds that the land Gini coefficient has a significant negative relationship with land productivity. Consistent with this finding, a number of studies (Cornia, 1985; Ünal, 2012; Githinji, Konstantinidis and Barenberg, 2011) empirically exhibit that smaller farms have greater land productivity.

2.2 A comparative perspective

A comparative examination of development experiences in different regions suggests a positive relationship between land ownership inequality and income inequality. Historically, Latin America and parts of Sub-Saharan Africa are associated with a high degree of concentration of land. In much of Latin America, the agrarian structure is characterized by the coexistence of large plantation-type structures and extremely small family farms, called latifundios and minifundios, respectively (Furtado, 1976). The landlords holding latifundios mostly hire wage labor to cultivate their land. These landlords wield not only economic but also political influence over labor and institutions. The power inequality secures the existence of the inegalitarian agrarian structure (De Janvry, 1981). Similar structures are observed in some regions of sub-Saharan Africa (Frankema, 2010).

On the other hand, the agrarian structure in Asia tends to be associated with a greater prevalence of owner-cultivators and tenants. Among the East Asian countries, Korea and Taiwan experienced progressive land reforms, which led to agrarian structures in which small and medium family farms dominate. Even in South Asian and Middle Eastern countries without significant land redistributions, the land inequalities are lower than in Latin America and the proportion of landless labor in the rural population is smaller (see Appendix A).

Although agrarian structures may be an important factor underlying interregional differences between levels of income inequality, this does not mean that the regions are entirely dominated by a single agrarian structure. Medium-scale family farms are common in parts of Latin America (Furtado, 1976; Barraclough and Domike, 1966), while in Asia many peasants work under a wage labor relationship (Bardhan, 1984; Boratav, 1989). In addition, even countries with similar agrarian structures may exhibit dissimilar levels of land inequality. Therefore, the national land Gini coefficient is a more accurate measure for land inequality than crude regional dummies.

Prior empirical studies have documented the positive relationship between land and income Gini coefficients (Carter, 2000), and shown that a greater share of land owned by small and medium (Bourguignon and Morrisson, 1998) and/or family farms (Easterly,

2007) reduces overall income inequality. Figure 2.1, constructed for this study, exhibits a positive relationship between early land inequality and later overall income inequality for 62 countries. The horizontal axis on the figure is the value of land inequality for years in and around the 1960s, here taken as a measure of pre-urbanization land distribution. A large dataset for land Gini coefficients is not available for earlier years, and the massive flows of rural-to-urban migration in the developing world had begun after 1950s (Araghi, 1995). The figure's vertical axis is the most recently measured income Gini coefficient for the country[2]. The Pearson correlation coefficient between the income and land Gini coefficients is 0.48.

The Southern African countries (Botswana, Lesotho, Malawi, South Africa, Swaziland and Zambia) have very high income inequality values compared to their initial land inequalities and appear as outliers in Figure 2.1. One explanation for that might be Southern African countries' high degree of dependence on incomes from minerals, which tend to be very unequally distributed[3]. Interracial income gaps also are an important factor increasing income inequality in some Southern African countries (Özler, 2007). In Figure 2.2, I exclude the Southern African countries from the sample. Figure 2.2 presents a clearer positive relationship and the Pearson correlation coefficient increases to 0.58. In summary, the figures suggest that initial conditions of land distribution matter for determining national income inequality in the long run.

2.3 Theoretical framework

There are two groups of arguments that explain the close relationship between income and land inequalities. Figure 2.3 presents a schematic picture of both arguments. The institutional mechanism is drawn in blue, the bargaining mechanism in red. This study's

[2]Our larger dataset also includes values of expenditure inequality, but these are excluded in the figure. These observations will proxy income inequality in the econometric analyses, with the use of a dummy to account for the difference between income inequality and consumption inequality.

[3]Acemoglu, Johnson and Robinson (2003) claim that Botswana is an exceptional case, as most of the revenues coming from minerals are captured by the government. They also claim that most of these revenues are used for productive activities like infrastructure investments. Nevertheless, the government of Botswana is also the biggest employer in the country and the salaries that the government pays to high-ranked government officers is substantially higher than the incomes in the rest of the country (Good, 1993). This may be one of the reasons why Botswana is still one of the most unequal countries in the world with an income Gini coefficient of 0.60 (Martin, 2009).

emphasis is on bargaining. Nevertheless, I will begin with a brief summary of the institutionalist arguments, and I will control for institutional variables in the regression analysis.

2.3.1 The institutionalist aspect

The institutionalist studies focus primarily focus on wealth distribution's impact on human capital and biases in education policies. They mostly follow the neoclassical assumption that income differences are the results of labor productivity gaps between individuals. The first group of institutionalist studies addresses the direct impact of land distribution on income inequality. In underdeveloped countries, the poor cannot invest on education due to credit constraints (Galor and Zeira, 1993). Even when credit is potentially available, investment in education is more costly for the poor, since most of it is financed by borrowing capital rather than by intrinsic family incomes (Galor and Tsiddon, 1996). In addition, the returns to investment in education are minimal for very low levels of education. Therefore, education investment becomes beneficial only for the rich; for people with lower income levels the costs of education exceed its expected returns. As a result, the lower-income people are trapped in an inferior education equilibrium. Only the rich benefit from technical change, and income inequality increases[4].

The second line of institutionalist studies addresses the connection between land distribution and power inequality, which might be crucial in determining education policies. According to Galor, Moav and Vollrath (2009), in underdeveloped agrarian societies, the landlords tend to block education reforms that would extend the education frontier to a larger portion of society. This is because landlords see little benefit in having an educated peasantry, so they refuse to finance widespread access to education. The greater land inequality brings landlords greater power to limit public spending on education (Engerman and Sokoloff, 2005; Frankema, 2009; Wegenast, 2009). Eventually, however, industrialization results in a shift of power toward urban capitalists who are more willing to finance

[4]In the later phase of development, a larger portion of the society can and would invest in education as the credit constraint loosens and labor productivity (and hence wages) increases with improving technology. As a result, the negative impact of land inequality would be reduced (Galor and Zeira, 1993; Galor and Tsiddon, 1996).

public education since educated urban wage laborers are valuable to industrial employers (Galor, Moav and Vollrath, 2009; Bowles, 1978).

Bourguignon and Verdier (2000) analyze the politics of state support for public education. According to Bourguignon and Verdier, in undemocratic societies the educated oligarchy might not have incentives to initiate democratic transition, since democracy forces the rich to subsidize the poor's education. Bourguignon and Verdier show that if inequality is high, the elite would block the democratization process, because the elites' loss from the new taxation would be greater than their gains from the productivity improvements earned by the spread of education. However, if inequality is lower, the rich could benefit from an expanded education frontier as education of the poor results in rising productivity.

Engerman and Sokoloff (2005) show that Bourguignon and Verdier's theory is consistent with the historical experience in the Americas. In the Latin American countries which have relatively hierarchical structures, the franchise and extent of voting enlarged more slowly than in the US and Canada in which more egalitarian structures were observed in the 19th century. As a result, for the period 1850-1950, the literacy rates in the Latin American countries were significantly lower than the literacy rates in the US and Canada. Thus, the education frontier did not extend to a large segment of population in Latin America.

2.3.2 The bargaining aspect

The second aspect of the land-income inequality relationship involves the bargaining impacts of land distribution. In his groundbreaking article "Economic Development with Unlimited Supplies of Labor," Lewis (1954) claimed that flows of labor from the subsistence to the capitalist sector help the accumulation of capital by suppressing wages and enhancing the growth of surplus in the capitalist sector. The flow of labor in the Lewis model is usually associated with rural-to-urban migration (e.g. Ranis and Fei, 1961; Anand and Kanbur, 1985). If we identify rural-to-urban migration with the unlimited supplies of labor in the Lewis model, the model suggests that urbanization will raise the proportion of lower-income groups within the urban population and hold down wages in the urban sector.

Proceeding from this insight, we need to address two questions: 1) What are the major factors that stimulate urbanization? 2) How does the flow of "unlimited supplies of labor" influence urban income inequality?

An individual's decision to move from a rural area to the city is influenced by a host of factors including age, family relations, culture, disasters, conflicts, diseases, and more. Nevertheless, the trend of urbanization is mostly stimulated by changing income opportunities both in the urban and rural areas. Historically, the rate of urbanization accelerated with capitalist development. Indeed, the percentage of the world population living in cities of 20,000 or more was only 2.4% in 1800. It increased to 9.2% in 1900 and to 20.9% in 1950 (Davis, 1955). Most growth of the world urban population during this period occurred in the nations that were early industrializers.

In the underdeveloped world, the growth of industry was slow until the 1950s. Therefore, between 1925-1950 only 10% of the rural population moved to the urban areas in the developing countries for which data is available (Araghi, 1995). Then from 1950-1975 the percentage of the rural population that moved to the urban sector jumped to 25%. This may be due in part to the emerging industrial policies[5] and availability of cheap food reducing the costs of labor. In addition, push factors like the spread of labor-saving technologies in agriculture (De Janvry, 1981; Köymen, 2008), the destruction of "z-goods" production (Hymer and Resnick, 1969), and an urban bias in national policies (Lipton, 1976; Williamson, 1988) might have stimulated urbanization in the developing economies.

A variety of models such as Harris-Todaro (1970) (also Cole and Sanders, 1985; and Fields, 1975, 2005) seek to explain urbanization on the basis of the difference between expected rural and urban incomes. Moreover, a considerable amount of empirical evidence (e.g. Bowles, 1970; Fields, 1982; Schultz, 1982) shows that intersectoral differences in income levels significantly affect migration decisions. The expected income of a regular rural dweller is determined by both per capita rural income and the distribution within the rural sector. Thus, for the same per capita urban and rural incomes, there will be greater

[5] Amsden (2001) and Chang (2008) give good summaries on how import substitution and export-oriented industrial policies stimulated the growth of industry in the developing world.

urbanization in countries whose land distribution is more unequal. The congestion in cities pull down wages, especially of the urban unskilled workers.

This phenomenon is briefly mentioned by Griffin, Khan and Ickowitz (2002) in this passage: "The incomes of the rural poor set a floor for urban wages, since no one will migrate from the countryside to the city unless they expect to be at least as well off as before migration. Higher rural incomes will therefore raise the 'reservation wage' of the urban poor and this will help to reduce urban poverty." The authors go on to note that redistributive land reforms influence urban distribution.

A number of studies (e.g. Harris, 1978; De Janvry, 1981) on 'inegalitarian' Latin America argue that the poor peasants supply cheap labor both for urban and rural capitalist activities. Cheap labor becomes even more readily available when the rapid spread of a labor-saving technology leaves the workers in plantations unemployed. This suppresses urban wages in the Latin America. On the other hand Amsden (1989, 1990) for Korea and Keyder (1987) for Turkey[6] claim that the predominance of family farms made staying in agriculture a better option for peasants. This kept urban inequality in Korea and Turkey at lower levels[7] than the inequality in Latin America.

A significant proportion of rural-to-urban migrants cannot be absorbed by the urban capitalist sector. However, consistent with the Harris-Todaro (1970) framework, these individuals still migrate with the future expectation of being employed in a formal job (Banerjee, 1983). For a period of time, the unemployed new urban dwellers spend their savings and/or receive remittances from their family back in the rural sector (Mazumdar, 1976). In the

[6]See Köymen (2008), Önal (2010) and Gürel (2011) for the critiques of Keyder's(1987) thesis. The main argument in these studies is that the average peasant incomes in Turkey were still low and do not have a positive impact on urban inequality. Gürel explains the higher Turkish wages in 1960s and 1970s by the labor movements at the time. Nevertheless, we need to keep in mind that the labor movements are not entirely exogenous and the agrarian structures can influence the emergence of these movements.

[7]Keyder (1987) frames this as "the agrarian structure exerted an upward pressure on urban wages". The impact of egalitarian distribution is probably better explained by Amsden (1989) who argues that as an outcome of land reform in Korea "rural-urban migration and downward pressure on manufacturing wages can be assumed to have been less massive than it would otherwise have been". We need to keep in mind that in any case the flow of rural to migrants exerts pressure on urban wages, but the pressure is lower for the countries with lower land inequalities.

medium run, these individuals become underemployed in the urban subsistence sector[8]. These individuals wait to be employed especially in formal jobs, where they would receive guaranteed and higher income. Thus, there is a reserve army of labor located within the urban subsistence sector (Patnaik, 2008; Hart, 1973; Williams and Tumusiime-Mutebile, 1978)[9]. The existence of this reserve army limits the bargaining strength of labor and reduces the urban wages in the formal or capitalist sector.

In developing economies, the long-run changes in urban employment are smaller than the developed economies so the waves of urbanization mostly affect the size of urban subsistence sector, which is generally larger than the pool of the unemployed (Fields, 1975). Therefore, this study will focus on the urban subsistence sector. The term "urban subsistence sector" here is slightly different than the classical usage of urban informal sector that includes all unregistered activities (e.g. Schneider, Buehn and Montenegro, 2010; Castells and Portes, 1989). My definition of subsistence sector is similar to the Lewisian definition. The subsistence sector consists of petty commodity producers and self-employed, but excludes unregistered activities that employ wage-labor solely in pursuit of profit maximization.

There are two main characteristics attributed to the subsistence sector. First, the subsistence sector does not accumulate a significant amount of capital. The subsistence activities survive through supplying cheap goods and services to the lower-income groups (Gerry, 1978). The capitalist enterprises leave these activities to the subsistence sector, since these activities are less profitable. Moreover, in the subsistence sector the barriers to entry are very few, which inevitably leads to competition between numerous subsistence agents. Therefore, the markup rates of subsistence activities are low and many of them can survive only with the help of self-exploitation. These producers consume the majority of

[8]Urban unemployed's ties with their family also loosen in time. Therefore, it is reasonable to assume that the urban unemployed will not be supported by their already lower income families for a long period of time.

[9]None of these social scientists explicitly use the term subsistence in their work, but they meant activities similar to subsistence activities used in this paper. Patnaik (2008) mentions that there is a "distant reserve army of labor" within the precapitalist sector. According to Williams and Tumusiile-Mutebile (1978) the petty-commodity producers in Nigeria and according to Hart (1973) the underemployed in Ghana's informal sector act as a reserve army. In Hart's study where the term "informal sector" is first defined, Hart uses "informal sector" as to the refer to the unproductive activities of the self-employed that are very similar to the activities I characterize as subsistence sector activities in this paper.

their surplus and can accumulate very little capital (Kalyan, 2007)[10]. As a result, growth in the urban subsistence sector is significantly lower than growth in the urban capitalist sector. In addition, agents in the subsistence sector have only a very small likelihood of successfully taking on more profitable activities (Nattrass, 1987). The subsistence agent faces disadvantages of capital, skill and institutional structure. Thus, very few activities change sectors and very few subsistence agents become capitalist entrepreneurs.

The second characteristic attributed to the subsistence sector is zero marginal productivity of labor. According to Lewis (1954), there is excess labor employed in the subsistence sector. He defines excess labor using the concept of "disguised unemployment". This term implies that an increase in labor supply does not contribute to the production in the subsistence sector. A few examples fitting this would be street trader/hawkers or small family stores and restaurants in poor neighborhoods that hire unpaid family labor. Both the entry of new street hawkers/family stores and additional family labor engaging in these activities can only have a marginal effect on overall urban subsistence production. We should accept that zero marginal productivity of extra labor is an oversimplification. Nevertheless, it is plausible to assume that congestion in the urban subsistence sector leads to greater impoverishment since an extra laborer only marginally increases total production while reducing the slice of income that each subsistence individual can get.

Next, we will analytically examine how the agrarian structures influence urban inequality through leading to congestion in the subsistence activities.

2.4 A simple model on urbanization and inequality

2.4.1 Migration Behavior

For the reasons discussed above, we will assume that the rural-to-urban migration decision depends on the incomes within the urban and rural sectors. For a reasonable analysis, not only the intersectoral income gap but also migrants' chances of being employed should

[10]Kalyan (2007) frames the activities we mention here as "the need economy". He proposes a circuit of capital like M-C-C'-M'-M-C in which M'-M is producers' consumption. In this study, we are easing Kalyan's assumption of zero accumulation.

be taken into account. Therefore, I follow the Harris-Todaro (1970) framework in which differences in expected incomes are considered. This can be written as

$$W_U^e = S_R + C \tag{2.1}$$

where W_U^e is migrants' expected income in the urban sector and S_R is peasants' pre-migration returns. This study will be concerned about the rural-to-urban migration of the masses -peasants in family farms and wage workers in plantations, rather than owners of large landlords who are in the upper income brackets. Because I assume that poor and average rural dwellers are agents who influence urban wages, I focus on peasants pre-migration returns (S_R). S_R is determined by per capita agricultural product and the structure of distribution in different agrarian structures. It would evolve following the agrarian changes in the society. The variable C is the cost of migration from the rural to the urban areas. The cost of migration for rural dwellers is not only the monetary cost of settling in an urban place, but also the psychological cost of the change in lifestyle. I assume that there is a one-way migration trend from the urban to the rural sector, since this paper is interested in long-term effects of rural structures. Therefore, the cost of migration is only relevant for migration from rural to urban.

Like Fields (1975, 2005), this paper assumes that the Harris-Todaro equilibrium condition holds in the developing economies. In fact, Pissarides and McMaster (1990) show that interregional migration responds to the changes in regional inequalities; however, individuals follow a lagged response to the changes. Therefore, in reality economies mostly diverge from the Harris-Todaro equilibrium. Nevertheless, this paper examines the long-term impacts of agrarian structures on the urban inequality. The Harris-Todaro equilibrium condition would be a reasonable assumption for analyzing these long-term tendencies.

Some of the studies following Harris-Todaro also investigate whether the expected urban and rural incomes have symmetrical effects (Fields, 1982). The empirical studies (Fields, 1982; Schultz, 1982) show that both declining rural and increasing urban incomes have significant effects on the migration decisions. Therefore, for simplicity changes in the urban and rural incomes are taken to have a symmetric impact on migration.

The expected urban incomes of migrants depend on the urban wages, and the rate of employment. The expected urban income of migrants is

$$W_U^e = \frac{W_F L_F}{L_U} + \frac{W_S L_S}{L_U} \tag{2.2}$$

where W_F is an employed migrant's wage, L_F is the volume of urban employment, W_S is an underemployed person's income, L_S is the volume of urban underemployment and L_U is the urban labor force. An examination of empirical data shows that the unemployment rates generally were not worsened following the urbanization trend (Fields, 1975). The growth in the urban sector rather changed the share of underemployed in the developing economies (Rauch, 1993). Therefore, this study also focuses on urban underemployment and avoids urban unemployment[11]. Hence, the urban population is

$$L_U = L_F + L_S \tag{2.3}$$

Underemployed individuals are urban dwellers doing subsistence activities. For the reasons that we discussed above, the agglomeration of labor in subsistence activities will not increase overall production, it will rather pull down the average subsistence income. Following Fields (1975), we will assume that the urban subsistence income is equally shared and per capita income is

$$W_S = \frac{Y_S}{L_U - L_F} = \frac{Y_S}{L_S} \tag{2.4}$$

where Y_S and L_S are total urban subsistence income and the number of underemployed respectively. Combining all, the Harris-Todaro equilibrium condition is

$$W_U^e = \frac{W_F L_F}{L_U} + \frac{Y_S}{L_U} = S_R + C \tag{2.5}$$

[11]It also avoids the changes in labor participation rate through changing labor participation of women. We will examine the impact of the non-agricultural labor participation of women in the empirical section of this paper.

2.4.2 Agrarian structures and urban wage determination

Since this model assumes no urban unemployment, we assume that a member of the urban labor force will either be employed as a wage worker or will be underemployed in the urban subsistence sector. Urban wages for those employed are determined by a function dependent on urban workers' fallback position. The urban subsistence sector acts as a reserve army of labor and is considered to contain individuals who search for jobs within the urban capitalist sector (Patnaik, 2008; Hart, 1973; Williams and Tumusiile-Mutebile, 1978). Thus, similar to a Phillips Curve relationship, the urban capitalist wage is a positive function of the rate of employment within the urban capitalist sector. The urban capitalist wage is also dependent on the reservation wage z, which is the urban subsistence income in this model. Therefore, urban wages are determined by the following function[12]:

$$W_F = f(z, \frac{L_F}{L_U}) = f(\frac{Y_S}{L_S}, \frac{L_F}{L_U}),\ f_1 > 0,\ f_2 > 0 \tag{2.6}$$

In this model, x number of capitalists own x identical firms whose production is described by the production function

$$y_f = n(l_f, k) \tag{2.7}$$

where l_f is the number of workers employed and k is the capital stock in each firm. Following this, the overall production in the urban capitalist sector is

$$Y_F = F(l_F x, kx) = F(L_F, K) \tag{2.8}$$

where L_F is the total employment in the urban capitalist sector and K the total capital stock in the urban capitalist sector. The first and second order conditions for the production function are

[12]This condition is also similar to the non-shirking condition function in Shapiro-Stiglitz (1984), which examines the wages from a slightly different perspective by considering the conditions of shirking.

$$F_1 > 0,\ F_2 > 0,\ F_{11} < 0,\ F_{22} < 0,\ F_{12} > 0 \tag{2.9}$$

Wage improvements reduce employers' incentive to hire. Following this the aggregate labor demand (L_D) is

$$L_D^F = g(W_F, K),\ g_1 < 0,\ g_2 > 0 \tag{2.10}$$

In summary, the bargaining and labor demand functions determine the levels of urban wages and employment. Thus we can rewrite the bargaining equation (BC) as:

$$W_F = f(\frac{Y_S}{L_S}, \frac{L_F}{L_U}) = f(\frac{Y_S}{L_U - g(W_F, K)}, \frac{g(W_F, K)}{L_U}) \tag{2.11}$$

From here the impact of urbanization on wages is

$$\frac{dW_F}{dL_U} = \frac{Y_S f_1/(L_U - g)^2 + g f_2/L_U^2}{Y_S f_1 g_1/(L_U - g)^2 + g_1 f_2/L_U - 1} < 0 \tag{2.12}$$

In the case that all other conditions are the same, the increase in the urban population pulls the urban wages down by reducing urban subsistence income and the employment rate. We can rewrite the bargaining equation (BC) and labor demand (L_D) as a function of urban population and reorganize the Harris-Todaro equilibrium:

$$W_F = h(L_U),\ h^{'} < 0 \tag{2.13}$$

$$L_F = g(h(L_U), K),\ g_1 < 0,\ g_2 > 0 \tag{2.14}$$

$$\frac{g(h(L_U), K)}{L_U} h(L_U) + \frac{Y_S}{L_U} - S_R - C = 0 \tag{2.15}$$

which gives

$$\frac{dL_U}{dS_R} = \frac{L_U^2}{-Y_S + h'(g_1 h + g) L_U - g h} \tag{2.16}$$

dL_U/dS_R will surely be negative, if $(g_1 h + g) > 0$. This condition holds if the wage elasticity of labor demand is greater than -1. Most of the empirical studies on develop-

ing economies including studies on Latin American, African, Eastern European and Asian countries (Fajnzylber and Maloney, 2005; Lucas, 1996; Basu, Estrin and Svejnar, 2000; Min, 2007) show that the wage elasticity of labor demand is significantly greater than -1. Thus, dL_U/dS_R is very likely to be negative. When this is so, from (2.13),(2.14) and (2.16) higher income for peasants leads to higher wages and lower employment in the urban capitalist sector.

$$\frac{dW_F}{dS_R} > 0,\ \frac{dL_F}{dS_R} < 0 \tag{2.17}$$

Also from (2.6) and (2.12), we know that increase in L_U cannot reduce L_S by creating more employment(L_F) than the increase in L_U. Hence,

$$\frac{dL_S}{dL_U} > 0,\ \frac{dL_S}{dL_U}\frac{dL_U}{dS_R} < 0,\ \frac{d(Y_S/L_S)}{dS_R} > 0 \tag{2.18}$$

The implications of the model can graphically be observed in Figure 2.4. In the figure, the wages are determined by the bargaining (BC) and labor demand (L_D) curves. The curve BC' represents bargaining when peasant incomes are lower. That is, when peasant incomes are lower, so are urban capitalist wages. The reasoning here is that when peasant incomes are lower, there is a greater push toward the cities. Nevertheless, not all of these extra migrants will be able get employed in the urban capitalist sector. Hence, a greater number of urban dwellers will be congested in the urban subsistence sector. The congestion will pull the per capita urban subsistence incomes down to an even lower level. This would decrease the fallback position for the urban wage workers and allow a slightly greater number to be employed in the urban capitalist sector. Hence, if the wage elasticity of labor demand is above -1 the profit shares increase:

$$\frac{d((Y_F - W_F L_F)/Y_F)}{dS_R} < 0 \tag{2.19}$$

Figure 2.5 exhibits the possible increase in the urban Gini coefficient. In the Lorenz Curve, the urban population is divided into the three categories of urban underemployed, urban employed, and urban capitalists, listed in order of ascending income. The ratio between proportions of urban subsistence income to total urban income and urban subsistence

workers to total urban population $\left(\frac{(Y_S/(Y_F+Y_S)}{L_S/L_U}\right)$ gives the slope on the left part of the Lorenz Curve. As the congestion in urban subsistence sector does not lead to greater employment in the urban employed, the rise in the overall urban inequality will be guaranteed. This can clearly be seen from

$$d\left(\frac{(Y_S/(Y_F+Y_S)}{L_S/L_U}\right)\Big/ dL_S = \frac{(d(L_F/L_S)/dL_S + d(x/L_S))/dL_S)}{(1+Y_F/Y_S)} - \frac{(d(Y_F/Y_S)/dL_S)(L_U/L_S)}{(1+Y_F/Y_S)^2} \tag{2.20}$$

where x is the number of urban capitalists. In this condition, a decline in the peasants' income increases overall urban inequality, since the slope representing the underemployed becomes flatter and the urban population share of subsistence workers increases. Since the profit share would also rise, the Lorenz Curve would expand.

The incomes of peasants will be determined by the combination of the overall level of agricultural production and the distribution imposed by agrarian structures. There are several agrarian structures that can be considered and in each structure different outcomes for distribution could be observed. The agrarian structures that we will examine are:

a. Subsistence rural sector with fully egalitarian distribution: As with the urban subsistence sector, we make the extreme assumption of zero marginal productivity of labor; the extra family labor does not contribute to production. This is an assumption imposed in the Lewis (1954) model and could be a reasonable approximation for many developing economies. The assumption of fully egalitarian distribution gives us the result that each peasant's income is equal to the average product:

$$S_R = \frac{Y_R}{L_R} \tag{2.21}$$

where Y_R and N_R are the total amount of output and labor in the rural sector. It is assumed that all of the rural labor is employed, so the labor force is equal to employment ($N_R = L_R$).

b. Subsistence rural sector with identical peasants and income extraction of rentiers: In many of the structures with subsistence farms, we observe that subsistence farms coexist

with larger landlords. The large landlords also take a rentier class position and earn rent through sharecropping/fixed rent contracts. In addition, they extract part of peasants' surplus through merchant and usury activities. This kind of surplus extraction is a significant feature of the agrarian structures in various parts of Asia (Bardhan, 1984; Chang, 1989; Boratav, 1989).

In these kinds of structures the distribution of land between small and large farms influences the shares of rent extracted. First, a monopsonic landowner holds an opportunity to demand a higher rent in fixed rent contracts or a greater share in sharecropping contracts (Griffin, Khan and Ickowitz, 2002). Even where the 50-50 rule is common in sharecropping contracts, the monopsonic landowner can extract a greater share of rent through leaving the burden of input on the tenants. Second, as the land concentration increases the larger landlords can achieve greater control of merchant and usury activities, which would improve their share of rent.

We can see the impact of greater land concentration through the following model. We assume that large landlords own β_F of total land (H_T), lease α of their land through fixed rent or sharecropping contracts, get λ of surplus from leased land and extract γ of peasants' income through merchant or usury activities. We still follow the Lewisian assumptions for subsistence activities. Therefore, peasants' total incomes from self-owned (Y_P) and rented (Y_R) land are

$$Y_P = y_P H_P,\ Y_R = y_P H_R \tag{2.22}$$

where y_P, H_P, H_R are identical small peasants' production per land, amount of total land owned and amount of land rented respectively. Hence, income for each subsistence peasant is

$$S_R = \left(\frac{(1-\beta_F) y_p H_T + (1-\lambda(\beta_F))\alpha\beta_F y_p H_T}{N_P} \right)(1-\gamma(\beta_F)) \tag{2.23}$$

N_P is the number of small peasants in the rural sector. Greater land concentration (β_F) raises landlords' share on rent contracts and usury and merchant activities for the reasons suggested above. From here, the migration function for this type of agrarian structure is:

$$\frac{g(h(L_U),K)}{L_U}h(L_U)+\frac{Y_S}{L_U}-S_R^*(1-\gamma(\beta_F))-C=0 \tag{2.24}$$

where $S_R^*=((1-\beta_F)y_pH_T+(1-\lambda(\beta_F))\alpha\beta_F y_pH_T))/N_P$

From the implicit function theorem, the impact of greater land concentration on the level of urbanization is

$$\frac{dL_U}{d\beta_F}=\frac{y_pH_T((1-\gamma)/N_P)(1-(1-\lambda)\alpha+\lambda^{'}\alpha\beta_F)+\gamma^{'}S_R^*}{Y_S/L_U^2+gh/L_U^2-h^{'}(g_1h+g)/L_U} \tag{2.25}$$

If we follow the assumption the wage elasticity of labor demand is greater than -1, then $dL_U/d\beta_F>0$, since α, λ, γ and β_F are between 0 and 1, and $(dN_P)/(dL_U)=-1$. The impact of land concentration will rise as monopsony power of rentiers influence the rent contacts and usury and merchant shares. Therefore, higher rentier share would increase urban inequality as in Figure 2.6.

c. Latifundio-minifundio type farms: The plantation-type farms are rural structures in which the production is done by wage workers. These structures are mostly associated with the Latin American countries like Brazil, Chile and Peru (Furtado, 1976). Like urban capitalist enterprises, plantations are concerned with profit maximization. In Latin American countries, latifundios co-exist with minifundios in which peasants own an extremely limited income that would hardly enable them live. These are very small-scale subsistence family farms. Hence, it is plausible to assume that in minifundios the marginal labor does not contribute to overall production. Hence, peasant income in minifundios is

$$S_M=\frac{Y_M}{L_M}=\frac{(1-\beta_L)H_Ty_M}{L_M} \tag{2.26}$$

where Y_M and L_M respectively are the total production and labor in minifundios and H_T, β_L, y_M are overall rural land size, latifundios' land share and minifundios' production per unit land.

The total output in latifundios is dependent on labor and land size:

$$Y^W=Y^W(L_W,\beta_LH_T) \tag{2.27}$$

with the conditions of

$$Y_1^W > 0,\ Y_2^W > 0,\ Y_{11}^W < 0,\ Y_{22}^W < 0,\ Y_{12}^W > 0 \tag{2.28}$$

We take latifundios as profit maximizing structures with following profit function

$$\pi_W = Y^W(L_W, \beta_L H_T) - W_W L_W \tag{2.29}$$

where W_W is wage and L_W is amount of wage-labor in latifundios. The first order condition $Y_W^W = W_W^*$ will give the amount of wage labor in plantations (L_W^*).

We have not yet examined what will determine the wage in latifundios (W_W). Since the minifundios and latifundios mostly coexist together, the labor markets in each structure are not entirely distinguished from each other. In minifundios, extreme poverty forces the peasants to work in plantations either as temporary or permanent worker (De Janvry, 1981). If $\overline{L}_W$ is the number of landless peasants in latifundios and is $\overline{L}_M$ the labor living in minifundios, the owners of latifundios will demand extra labor (t) from minifundios, as long as the following condition exists

$$Y_1^W(\overline{L}_W, \beta_L H_T) > \frac{Y_M}{\overline{L}_M} \tag{2.30}$$

The flow of labor from minifundios will stop at

$$W_W^* = Y_1^W(L_W^*, \beta_L H_T) = S_M^* = \frac{Y_M}{L_M^*} \tag{2.31}$$

where

$$L_W^* = \overline{L}_W + t,\ L_M^* = \overline{L}_M - t \tag{2.32}$$

Thus, we get an equivalent level of income minifundios and wage workers in latifundios, which determine the level of income for marginal peasant. By using this model we can also show the impact of changing distribution in these structures. The income of each minifundista can be rewritten as

$$S_M = \frac{(1-\beta_L)H_T y_M}{\overline{L}_M - t} \tag{2.33}$$

From here we can get two equations that explain the changes in the latifundio-minifundio structure:

$$F^1 = Y_1^W(\overline{L}_W + t, \beta_L H_T) - (1-\beta_L)H_T y_M/(\overline{L}_M - t) = 0 \tag{2.34}$$

$$F^2 = \frac{g(h(L_U), K)}{L_U}h(L_U) + \frac{Y_S}{L_U} - \frac{(1-\beta_L)H_T y_M}{\overline{L}_M - t} - C = 0 \tag{2.35}$$

The changing land share affects both the amount of t and L_U. The impact of land share is determined by

$$\begin{bmatrix} \dfrac{dF^1}{dL_U} & \dfrac{dF^1}{dt} \\ \dfrac{dF^2}{dL_U} & \dfrac{dF^2}{dt} \end{bmatrix} \begin{bmatrix} \dfrac{dL_U}{d\beta_L} \\ \dfrac{dt}{d\beta_L} \end{bmatrix} + \begin{bmatrix} \dfrac{dF^1}{d\beta_L} \\ \dfrac{dF^2}{d\beta_L} \end{bmatrix} = 0 \tag{2.36}$$

From here the Jacobian is

$$\left|J\right| = \begin{bmatrix} \dfrac{(1-\beta_L)H_T y_M}{(\overline{L}_M - t)^2}\dfrac{d\overline{L}_M}{dL_U} + Y_{11}^W \dfrac{d\overline{L}_W}{dL_U} & Y_{11}^W - \dfrac{(1-\beta_L)H_T y_M}{(\overline{L}_M - t)^2} \\ \dfrac{(g_1 h' h + g h')L_U - gh}{L_U^2} - \dfrac{Y_S}{L_U^2} + \dfrac{(1-\beta_L)H_T y_M}{(\overline{L}_M - t)^2}\dfrac{d\overline{L}_M}{dL_U} & -\dfrac{(1-\beta_L)H_T y_M}{(\overline{L}_M - t)^2} \end{bmatrix} \tag{2.37}$$

and

$$\left|J\right| < 0 \tag{2.38}$$

considering that the total decline in population in minifundios and latifundios is the growth of population in the urban sector ($d\overline{L}_W/dL_U + d\overline{L}_M/dL_U = -1$) and following the

assumption that the wage elasticity of labor demand is greater than -1. The impact of land share on the urban population is

$$\frac{dL_U}{d\beta_L} = -\frac{\begin{bmatrix} Y_{12}^W H_T + \dfrac{H_T y_M}{\overline{L}_M - t} & Y_{11}^W - \dfrac{(1-\beta_L) H_T y_M}{(\overline{L}_M - t)^2} \\ \dfrac{H_T y_M}{\overline{L}_M - t} & -\dfrac{(1-\beta_L) H_T y_M}{(\overline{L}_M - t)^2} \end{bmatrix}}{\left| J \right|} \tag{2.39}$$

Thus, the sign of $dL_U/d\beta_L$ becomes positive when

$$\frac{(1-\beta_L) H_T}{\overline{L}_M - t} Y_{12}^W + Y_{11}^W < 0 \tag{2.40}$$

which is satisfied when

$$\frac{d(\overline{L}_W + t)}{d(\beta_L H_T)} < \frac{\overline{L}_M - t}{(1-\beta_L) H_T} \tag{2.41}$$

Thus, a regressive redistribution favoring latifundios pushes peasants to the urban sector, if the redistribution cannot create as many jobs in the latifundios as the number of the minifundistas losing their land. This depends on labor productivities in latifundios and minifundios.

According to Furtado's definition, the latifundios in Latin America are classified as farms hiring more than 12 workers. To examine the labor productivity ratios between latifundios and minifundios, we can check empirical studies. Thiesenhausen and Melmed-Sanjak (1990) examine the labor productivities in Brazilian farms for 1970s and 1980s. According to their estimates in the farms with land size between 2000-10000 hectares, the labor productivity is 5.2 times more than the farms with size between 10-50 hectares, 12.1 times more than the farms with size between 1-10 hectares and 22 times more than farms with land below 1 hectare. Therefore, if there is a regressive land distribution favoring latifundios', latifundios new land over wage labor created cannot exceed the production over labor ratio in minifundios. Hence

$$\frac{dL_U}{d\beta_L} > 0 \tag{2.42}$$

is very likely to be observed. Therefore, a regressive land redistribution pulls down both incomes of minifundios and wages in latifundios[13] and pushes peasants to the urban sector. Following our model, urban inequality is expected to be greater in a less egalitarian minifundio-latifundio structure.

2.4.3 Limitations of the model

The model presented above suggests a mechanism connecting land and income inequalities. Nevertheless, it excludes several issues that might deserve attention in future studies. First, the model takes the growth of capital in the given sectors as exogenous. The reason for that is that income inequality's influence on the long-run economic growth depends on various factors that can hardly be fully understood by the simple assumptions imposed in a model. The classical Lewis (1954) model conceives the flow of "unlimited supplies of labor" as positive for capital accumulation, since it lowers the capitalist wages and contributes to the growth of surplus. On the other hand, the neo-Kaleckian models take the capacity utilization rates into account and suggest that the Lewisian arguments might not hold. Among the neo-Kaleckian models, Dutt (1984) suggests a model which exhibits developing economies as wage-led, and Marglin and Bhaduri (1990) show that economies might either be wage or profit-led depending on their structures. In addition, the neo-Marxian models (Goodwin, 1967; Skott, 1989) claim that growth and wage shares are endogenous to each other; therefore, the unemployment rate and wage share follow circular cycles.

There are other factors that these models do not capture. As mentioned in the previous sections, high inequality creates an important impediment to the development of human capital. In addition, high inequality might lead to problems such as credit constraint problems, increased crime and corruption and social unrest (Griffin and Ickowitz, 1998; Voitchovsky, 2011) that might impede long-run economic growth. Indeed, several

[13]The latifundios often also extract part of minifundios' income through usury and merchant activities (De Janvry, 1981). Following Griffin, Ickowitz and Khan (2002), greater land concentration will have even further negative influence on S_R due to latifundios' greater rent extraction.

empirical studies (Easterly, 2007; Alesina and Rodrik; 1996; Deininger and Squire, 1998) show that higher income inequality reduced long-run growth during the second half of the 20th century. Due to the complex structure of inequality's long-run influence on growth, this essay does not attempt to incorporate inequality's impact on capital accumulation.

Second, the model does not take the urban-rural terms of trade into account. Following the Harris-Todaro (1970) framework, urban-rural terms of trade are influenced by the ratio of total urban and rural incomes. However, it might also be reasonable to assume that the urban-rural terms of trade converges to the world prices and, therefore turns into an exogenous variable as the economies become open to trade (Skott and Larudee, 1998). Nevertheless, my model does not have a detailed interpretation of inequality's impact on growth. Therefore, the model does not include a variable on the urban-rural terms of trade.

Third, the model does not consider the urban "marginal mass" consisting of workers who are not able to function as a reserve army for many industries (Nun, 2000)[14]. The group of workers described as the "marginal mass" might not be capable of working in the sectors that require skilled labor. Nevertheless, the marginal mass might still increase the surplus in the skilled sectors through providing cheap services to the wage workers, which might pull the skilled wages down in nominal terms.

Lastly, here I assume that rural dwellers are employed only in the agricultural sector. However, in the contemporary world an increasing number of peasants are employed in industry or services, which are often associated with the urban sector (Keyder and Yenal, 2011; Bernstein, 2003). These individuals either are employed in full-time jobs in the industrial or services sector or they work for wages part-time and pursue their traditional activities part-time. The direction that the new rural sector is moving towards is not entirely inconsistent with the framework depicted in this article. Higher land inequality might not enforce migration, that is physical relocation in every case. However, the individuals still can be added to the reserve army of labor as they seek jobs outside agriculture, even while they are living in the rural areas.

[14] Also see Kay (1989) for a detailed summary discussions around the marginal mass argument.

2.5 Empirical analysis

2.5.1 Variable selection

This section presents an empirical analysis testing the relevance of the arguments in the model. We will try to examine land inequality's influence on both urban and overall income inequality. For measuring land distribution, I use a dataset of 99 countries including Gini values from the 1960's. Using land distribution data from the 1960s has two advantages. First, it demonstrates the lasting effects of the pre-urbanization initial conditions. Second, it prevents any questions of reverse causality from clouding the analysis.

The overall income inequality is measured with an income Gini coefficient. However, some countries report only expenditure Ginis rather than income. This study uses expenditure Ginis as a proxy for income Ginis, but since expenditure Gini coefficients are smaller than income Ginis for the majority of countries that report both (Deininger and Squire, 1996), the regression includes a dummy variable controlling for the use of this proxy. The measurement of urban income inequality follows the same procedure: income Ginis where available, expenditure Ginis and a dummy variable when necessary. For measuring the level of urbanization, I used the share of population living in the urban sector.

The regressions also control for the Kuznets (1955) hypothesis by using log(GDP per capita) and its square. This is similar to the estimations in a number of studies (Ahluwalia, 1976; Jha, 1996; Mbaku, 1997; Barro, 2000). Another variable that might affect income inequality is trade openness. The mainstream argument relying on the traditional trade theory claims that trade openness increases inequality in the developed economies and reduces it in the developing economies (Stolper and Samuelson, 1941). Nevertheless, many political economists (Burke and Epstein, 2001; Kaplinsky, 2001; Onaran, 2009; Pollin, 2002; Rao, 1998; Rudra, 2008) claim that trade openness leads to more unequal distribution in both the developed and developing world. They assert that trade openness reduces labor's bargaining power through rising flexibility and substitutability of labor. This might lead to lowering wage shares and hence higher overall inequality. The possible effects of trade openness will be controlled by a variable measuring trade openness as a ratio of trade volume (exports + imports) over GDP.

This study conceives of the rural-to-urban migration as an important source for the creation of a larger reserve army of labor. However, there are other sources that can also help to sustain high levels of labor surplus. Both Marx (1867) and Lewis (1954) discuss the role of women's labor participation on the growth of the reserve army/unlimited supplies of labor. Therefore, this study also controls for the non-agricultural labor participation rate of women.

The regressions on the level of urbanization control for the logarithm of the country total land area. Many countries experience "first city bias", where a significant part of the urban activities agglomerate around one or two cities (Todaro and Smith, 2009). In countries with a large land area, large distances between the leading cities and rural areas might limit the growth in the share of urban population by increasing the costs of migration.

Lastly, this study also tests the relevance of arguments by Galor and Zeira (1993), Galor and Tsiddon (1996), Bourguignon and Verdier (2000) and Galor and Moav and Vollrath (2009) concerning institutions and education inequality. Controlling for the institutional mechanisms that might translate land inequality into urban income inequality allows us to see whether the bargaining effect makes a contribution independent of education disparities. The outcomes of higher education inequality can be observed in the longer run. Hence, I used 10-year lags of education Gini and indices of democracy. This also relieves the problem of reverse causality in the regressions where education Gini and indices of democracy are controlled.

2.5.2 Data sources

The land distribution dataset presented in this study is available in Appendix A. For consistency, I relied mainly on the land distribution dataset of Frankema (2010). Nevertheless, data from major sources like Deininger and Squire (1998), Muller and Seligson (1987), Berry and Cline (1979) and IFAD (2001) are also added to the sample[15]. In these studies, FAO's reports on the World Census (1950, 1960, 1970) are important sources for the calculation of the majority of the land Gini values. Nevertheless, the agriculture surveys are

[15]Countries with a population below 1 million are excluded from the sample.

not conducted yearly. For the majority of countries, there is a long time span between two surveys and for many of the countries there are only 1-2 available land distribution observations. This does not allow us to have a balanced series for land distribution. Therefore, this study uses one observation from a year around 1960.

The overall income/expenditure Gini coefficients are from CEPAL database for Latin American, PovcalNet for Asian and African, Asian Development Bank database for Asian, Eurostat database for European and OECD database for non-European developed countries. Various other sources were helpful including UNU-WIDER (2008)'s World Income Inequality Database for reaching data not available in any of the sources above[16]. The details for the data sources are listed Appendix A. The urban inequality dataset is limited compared to the dataset for overall income inequality. One of the reasons for this is that in most of the developed economies, a clear divide between urban and rural sectors disappeared. Hence, for the majority of developed countries Gini values are not calculated separately for urban and rural sectors. For the developing countries, two UN-Habitat (2010a, 2010b) reports, "State of the World Cities 2010/2011: Bridging the Urban Divide" and "The State of African Cities 2010: Governance, Inequality and Urban Land Markets" are important sources for urban Gini coefficients. The rest of the observations come from CEPAL (2011), PovcalNet (2011), Eastwood and Lipton (2004) and various other sources listed in the Appendix A. Since the observations for urban Gini are already limited, I only used the most recent urban Gini observations.

For GDP per capita, I used the data of Penn World Tables v7.0. The level of urbanization, trade openness, non-agricultural labor participation rate and total land area come from World Bank's World Development Indicators. Education Gini coefficients come from Benaabdelaali, Hanchane and Kamal's (2012) study. Benaabdelaali, Hanchane and Kamal calculate education inequality by using Barro and Lee (2012)'s dataset on educational attainment. I used education Gini coefficients for population aged 15 and over. For controlling the levels of democracy I used two different indices. The first index is Polity IV formed

[16]The main problem with the UNU-WIDER (2008) database is that it has not been updated recently; the database ends at 2006

by Marshall and Cole (2011). This index measures whether a country's regime is closer to full democracy or full autocracy. The second index I used is World Bank's Voice and Accountability index of Worldwide Governance Indicators. World Bank defines it as an index reflecting "perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media". The increases in both indices imply improvement in democracy. As these indices exhibit the citizens' capability of participating in political process, they can also be considered as a proxy of power inequality.

2.5.3 Empirical results

The cross-country equations I estimate are in the form of

$$urbangini_i = \beta_0 + \beta_1 landgini_i + \sum_{k=2}^{n} \beta_k X_{ki} + \epsilon_i \tag{2.43}$$

$$incomegini_i = \beta_0 + \beta_1 landgini_i + \sum_{k=2}^{n} \beta_k X_{ki} + \epsilon_i \tag{2.44}$$

where for country i and in year t, $urbangini$, $incomegini$, and $landgini$ are urban income Gini, overall income Gini and land Gini coefficients respectively. I use OLS regressions, since the land inequality data are very limited, imbalanced and discrete. Moreover, the land inequality data are richer for 1950s, 1960s and 1970s; whereas, the income inequality data are richer for the period after 1990. This does not allow a reliable empirical analysis using country fixed effects. Nevertheless, OLS regressions are useful for our purposes, they allow us examine whether the cross-country differences of land inequality are transmitted to the cross-country differences of urban and income inequalities.

First, Table 2.2 reports the results for the urban Gini coefficient. Consistent with our model, the results support a positive relationship between land inequality in the 1960s and recent urban Gini coefficient, when we control for Southern African countries (Botswana, Lesotho, Malawi, Mozambique, South Africa, Swaziland, Zambia) and several other variables. The Southern African dummy is significant for all of the regressions; however, we cannot see a significant proof for the existence of the Kuznets Curve and or the impacts

from trade openness. There is a weak evidence on women's labor force participation rate's negative impact on urban income inequality. Lastly, the coefficient education inequality is insignificant and the democracy indices take wrong signs implying that the expansion of democracy increases the income inequality. The lack of significance in some of the coefficients might be due to size of the sample used. Thus, we might expect the regressions with overall income inequality to give clearer results.

Next, the estimations for the overall income Gini coefficients are exhibited by Tables 2.3 and 2.4. The significance of coefficients in these tables improves with the larger number of observations. The coefficients for the land Gini are significantly positive in all of the regressions, which supports our hypothesis. In Table 2.3, the signs for $log(GDP)$ and $log(GDP)^2$ are respectively positive and negative and they significant at 1% level, when trade openness and women's non-agricultural labor participation are controlled. This seems to be an evidence in favor of the Kuznets hypothesis.

The impact of trade openness is not significant in all of the regressions and has contradictory signs. Thus, we cannot find strong evidence for the net impact of trade openness on overall Gini coefficients. The coefficient for women's non-agricultural labor participation is only significantly positive at 10% level in two of the four regressions; however, the signs are positive for all regressions. Thus, there is only weak evidence that women's non-agricultural labor participation tends to increase income inequality[17]. One potential explanation for the weak effect of women's labor force participation may be that, especially in the more developed economies, some women might occupy capitalist or rentier class positions. In this case, some of the increase in women's labor force participation is not captured by the reserve army of labor.

The effect of education inequality is positive at 10% significance level for only one of the three regressions that control for the education Gini coefficient. Thus, the evidence on the impact of education inequality on the overall income inequality is surprisingly weak. This might be explained by two reasons. First, the education Gini coefficients are strongly

[17]We need to keep in mind that the income inequality in here is majorly measuring the inequality between households. For the obvious reasons, greater labor force participation of women is expected to increase the income gaps within households. However, this effect cannot be captured by this study's dataset.

correlated with GDP per capita. This is because the education Gini is strongly negatively correlated with the years of schooling[18] (Benaabdelaali, Hanchane and Kamal, 2012; Thomas, Wang and Fan, 2011), and increasing income per capita has a strong positive effect on years of schooling. For this reason also, education Gini's coefficients are more significant in the regressions where $log(GDP)$ and $log(GDP)^2$ are not included. We will not be concerned with the correlation between education Gini and GDP, since the focus of this study is exhibiting the importance of the bargaining aspect. Second, in many countries the premium for skill increases due to skill-biased technical change (Autor, Katz and Kearney, 2008). The increasing skill premium might keep income inequality at higher levels in countries where the education inequality is lower.

The inequality reducing impact of democracy is significant only in one of the six regressions in which I used Polity IV and the Voice and Accountability index as a proxies for democracy. Although democracy might expand the education frontier as depicted in Bourguignon and Verdier (2000) and Engerman and Sokoloff (2005), as with education inequality, better democracy might not necessarily reduce inequality due to rising skill premium. The signs for land Gini coefficients remain significantly positive in the regressions that control for education Gini. Hence, our hypothesis regarding land inequality's impact on bargaining relations is not rejected[19] even when we control for education inequality. Moreover, the lack of evidence on the influence of education inequality and democracy indices suggest that the bargaining aspect explains that relationship between land and income Gini coefficients better than the institutionalist aspect focusing on the education inequality.

To support the interpretation above, we will examine whether the positive relationship between land and income inequalities is due to the mechanism I posited in the theoretical section. First we will examine whether higher land inequality led to greater agglomeration in today's urban sector:

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[18]The correlation coefficient is -0.63 for the recent data.

[19]The correlation between education inequality and land inequality is very weak and surprisingly negative. The correlation coefficient between land and education Gini coefficients are -0.126. Similarly, the correlation coefficient between Polity IV index and land Gini coefficient are 0.094 the correlation coefficient between Voice and Accountability index and land Gini coefficient are 0.057

$$urban_i = \beta_0 + \beta_1 landgini_i + \sum_{k=2}^{n} \beta_k X_{ki} + \epsilon_i \tag{2.45}$$

where *urban* is the level of urbanization. Table 2.5 presents the results for the cross-country OLS estimation. The results are consistent with the argument that greater land inequality pushes more individuals to the urban sector. Also, as expected, higher GDP is associated with greater level of urbanization.

We then test the influence of greater urban agglomeration on income inequality. An OLS regression between urbanization and income inequality would likely suffer from an endogeneity problem[20]. Hence, I instrumented urbanization with its 20 year lag in the following form:

$$log(urban_i) = \beta_0 + \beta_1 log(urban90_i) + \sum_{k=2}^{n} \beta_k X_{ki} + \epsilon_i \tag{2.46}$$

$$incomegini_i = \beta_0 + \beta_1 log(urban_i) + \sum_{k=2}^{n} \beta_k X_{ki} + \epsilon_i \tag{2.47}$$

Table 2.6 show the results for the 2SLS regressions. The regressions exhibit that an increase in urbanization leads to higher inequality when other variables are controlled. Thus, consistent with the model, for a given income level, a greater congestion in the urban sector increases income inequality. The relationship is significant at the 5% level in four of the five regressions.For testing the robustness of results, I also report the simple OLS regressions where a higher level of urbanization is found to increase income inequality. The estimations in Table 2.6 do not support the claim that the expansion of education frontier is a significant determinant of the cross-country differences of income inequality. This again suggests that the bargaining aspect has more explanatory power than the institutionalist aspect.

[20]Indeed, the Hausman test shows that there is an endogeneity problem between urbanization and income inequality.

2.6 Conclusions

This chapter explores how the development paths that the developing countries follow are influenced by their agrarian structures. Much of the literature on the land-income inequality relationship suggests that land inequality leads to unequal educational opportunities that are often exacerbated by institutions favoring the non-poor (Engerman and Sokoloff, 2002; 2005; Galor and Zeira, 1993; Galor and Tsiddon, 1996; Galor, Moav and Vollrath, 2009; Bourguignon and Verdier, 2000). On the other hand, a number of studies briefly point out that land inequality also adversely affect bargaining power of workers (Griffin, Khan and Ickowitz, 2002; De Janvry, 1981; Harris, 1978; Keyder, 1987, Amsden, 1989; 1990). This study's contribution is to put the bargaining aspect at the center of the analysis and to develop a more thorough model explaining the causal link between land inequality and the distribution of income among different groups of urban dwellers.

My conclusion is that if the countries had lower land inequalities, a lower share of these countries' population would have been engaged in urban subsistence activities with low productivity. This would have allowed wage-workers to earn higher wages and hence the countries would have followed a more egalitarian development path with lower poverty. The results are supported by an empirical analysis showing that land inequality circa 1960s has significant positive impact on both more recent urban and overall income inequalities. The analysis also tests the robustness of bargaining effects by considering the education aspect. The impact of land inequality remains significant even when controlling for education Gini coefficients and power inequality/level of democracy, supporting my contention that land inequality influences urban income inequality through the wage bargaining mechanism. This bargaining effect operates independently of the education mechanism.

The results suggest that policies such as progressive land reforms or/and subsidies protecting small peasantry can have a positive long-term influence on the urban income distribution. Moreover, a significant amount of work suggests that countries with egalitarian agrarian structures can experience faster accumulation of human capital (Easterly, 2007; Deininger and Squire, 1998; Griffin and Ickowitz, 1998; Voitchovsky, 2011), which would increase the rates of long-run growth, as observed in the "East Asian Miracles" that followed

serious redistributive land reforms. Considering that almost the half the world's population is still living in rural areas, policies favoring the small peasantry can have lasting positive impacts; hence, more countries experiencing successful egalitarian development models can emerge. The results presented in this essay do not cover several issues, like the role of urban marginal masses or the evolving structure of the rural sector. Hence, this study leaves space for further examination of the relationship between income inequality and land inequality.

CHAPTER 3

THE ROOTS OF GINIS: A COMPARATIVE ANALYSIS OF TURKEY, KOREA, AND BRAZIL

3.1 Introduction

This chapter evaluates the impact of land distribution on income distributions through a comparative analysis. The chapter compares Turkey with two countries, Brazil and South Korea, which are characterized by markedly different income distributions and agrarian structures. Brazil is included as an inegalitarian Latin American case, with an agrarian structure characterized by very small-scale farms (minifundias) and large-scale farms (latifundias, commercial farms) employing wage labor. Korea is a relatively egalitarian East Asian economy that implemented a successful land reform beginning in the late 1940s. Although Korea was subject to authoritarian regimes and restricted labor rights until the late 1980s, its level of inequality is only slightly higher than those of European countries such as France, Germany and the Netherlands[1]. This is partly the result of the early wealth redistribution experienced in Korea. Turkey represents an intermediate case between Brazil and Korea, with an average level of inequality[2] and an agrarian structure in which family farms and semi-feudal structures co-exist.

There are two primary reasons for including a comparative analysis of Turkey, Brazil and Korea in this dissertation. First, focusing on specific countries allows us to conduct a more detailed analysis of the mechanisms affecting overall income distribution. Second, a comparative analysis allows us to employ detailed and relatively reliable data and to

[1] According to Kim (2011), Korea's Gini coefficient throughout the late 2000s is 0.310, which is slightly higher than France's, Germany's and Netherlands's Gini values for late 2000s, which are 0.293, 0.295 and 0.294, respectively (OECD, 2011).

[2] Turkey's income Gini coefficient for 2012 is estimated at 0.40 (Turkstat, 2013).

minimize the data problems and inconsistencies that can occur in cross-country analyses that consider a large number of countries.

The results of the analysis indicate that land inequality distinguishes Turkey's income inequality from conditions in Korea and Brazil through two mechanisms. First, the more egalitarian agrarian structure in Korea keeps Korea's educational inequality below that of Turkey. However, this channel does not explain the differences between Turkey and Brazil, as Brazil's higher level of urbanization reduces the inequality in educational attainment. However, overurbanization in Brazil has a second effect on income inequality; it encourages the growth of subsistence, informal and part-time employees that function as a reserve army of labor for the urban formal sector. Thus, by generating overurbanization, the more unequal distribution of land in Brazil ensures that Brazil's income Gini coefficient is greater than Turkey's.

This chapter first discusses why I compare Turkey with Korea and Brazil. Next, I discuss the impact of land inequality on the educational inequality in Brazil, Korea, Turkey and Brazil. The fourth section discusses how the distribution of land affects the income distribution in Korea, Turkey and Brazil by determining level of urbanization and the shares of informal, subsistence and part-time employment in these three countries. In the fifth section, the arguments proposed in this essay are tested through an econometric analysis of Korea, Turkey and Brazil. The final section concludes.

3.2 Why analyze Korea, Brazil and Turkey?

3.2.1 Brazil

Latin American countries are historically associated with high levels of inequality. The large Gini coefficient values can be associated with various factors such as the biased development of institutions or weaker bargaining power among new urban residents. These factors may be highly correlated with initial conditions characterized by the substantial land inequality resulting from the "colonial origins" of Latin American countries (Engerman and Sokoloff, 2005; Acemoğlu, Johnson and Robinson, 2001; 2002).

Among the Latin American countries, Brazil is considered one of the most inegalitarian. As Table 3.1 indicates, the Gini coefficient for income in Brazil is generally estimated to exceed 0.60. During the 2000s, Brazil's Gini experienced a substantial decline in response to Lula da Silva's policies (Fishlow, 2011; Neri, 2010); nevertheless, 2012 data reveal that Brazil remains the second most unequal Latin American country after Guatemala[3] (CEPAL, 2013). Thus, Brazil is included in this study as an example of high inequality.

The longstanding inequality experienced in Brazil could be substantially related to the agrarian conditions that existed during the early phases of Brazilian industrialization. According to Furtado (1976), during the period 1950-60, latifundios represented 4.7% of farms but owned 59.5% of total land, whereas minifundios that represented 22.5% of farms only owned 0.5% of total land (Table 3.2). When calculating this statistic, a minifundio is defined as a plot of land that is too small to provide employment for two individuals. Because the 'minifundistas' were never able to obtain a minimum income level above the absolute poverty line, they served as a resource for cheap labor for commercial farms.

Furtado defines a latifundio as a landholding employing over twelve permanent workers. These holdings are often associated with semi-feudal relations of production (De Janvry, 1981a; Barraclough and Domike, 1966). The landlords thus not only enjoy economic power, but they also have substantial political influence in the area (Barraclough and Domike, 1966). Landholders often exercise influence over local police and army officers, and churches and schools require a landholder's approval to prosper.

Data on the period 1970-80 indicate that sharecropping activities were very limited in Brazil. In 1970, only 3% and in 1980 only 2% of the total agrarian labor was engaged in sharecropping activities (Thiesenhusen and Melmed-Sanjak, 1990). In summary, the Brazilian agrarian structure is characterized by a combination of very small-scale farms and large and medium enterprises hiring wage labor. This type of structure is associated with the high level of land inequality in Brazil. For different years, the land Gini coefficient in operational units and the Gini coefficient for land ownership are approximately 0.80 and

[3]In 2012, Brazil was the second most unequal Latin American country with a Gini coefficient of 0.567 (Cepal, 2013), which is slightly lower than Guatemala's 0.585.

0.85, respectively (Table 3.3). These figures are significantly higher than South and South-eastern Asian land Ginis of approximately 0.60s or East Asian land Ginis of approximately 0.30-0.40s (Frankema, 2010; Griffin, Khan and Ickowitz, 2002). The natural result of a high degree of land inequality is an inegalitarian rural sector in Brazil (Table 3.1).

In addition to the latifundios, medium-scale farms also employ an important share of permanent and temporary workers in Brazil. Furtado (1976) defines farms that employ between 4 and 12 individuals as medium-sized farms and notes that these enterprises employed 42% of total agricultural labor in Brazil between 1950 and 1960 (Table 3.2). A study examining Brazil's agrarian structure in the 1970s indicates that farms with areas in the range of 200-2000 hectares employed 33% of total hired permanent and 18% of temporary labor (Thiesenhusen and Melmed-Sanjak, 1990). Thiesenhusen and Melmed-Sanjak consider these to be medium-sized farms. They also report that the shares of temporary and permanent hired labor in total agricultural labor and the share of employed labor hired by medium-sized farms rose between 1970 and 1980. This can be interpreted as an indicator of an increased commercialization of Brazilian agriculture due to the activities of medium-sized farms.

3.2.2 Korea

Korea is included in this study as example of an egalitarian developing country with distributional characteristics comparable to those of European countries. According to various estimations, Korea's Gini coefficient has remained at levels in the 0.30s (Table 3.4), which can be interpreted as low for a developing economy. A seemingly counterintuitive observation regarding the Korean experience is that income redistribution policies in Korea have been extremely limited. The Korean government generally prioritized investments over social transfers encouraging consumption (Amsden, 1989). The large conglomerates called chaebols benefited from substantial government subsidies (Kang, 2002). These conditions were partly the result of the long-term presence of authoritarian, military governments. Moreover, labor rights in Korea were extremely restricted until 1987. Furthermore, the Korean education system instilled Confucian values in students such as "loyalty, discipline, hard work, diligence and social harmony" (Kim, 2008). The Confucian values created patri-

archal and paternal relationships in Korean workplaces and reduced social cohesion between employers and workers (Koo, 1993). As a result, the number of strikes in Korea was very low relative to Latin American countries (Jenkins, 1991). In summary, the relationship between Korea's social and political history and its levels of distribution has been unconventional. Nevertheless, Korea achieved lower levels of inequality through the redistribution of wealth, specifically the land reform following World War II, rather than income redistribution. This makes Korea an interesting case for this study, as it reflects the impact of lower levels of land inequality on urban and overall inequality.

Before the land reform in Korea, tenancy was widespread: 48.8% of farmers were pure tenants and 34.7% were part tenants (Table 3.5). Rents represented 50-60% of all harvests. Moreover, tenants were responsible for cultivation costs (Griffin, Khan and Ickowitz, 2002). The distribution of land at the time was markedly unequal: the wealthiest 4% owned 50% of total land, and Japanese landlords owned 20%.

Following the Second World War, the US military government began to impose land reforms. In 1949 and 1950, the civilian government introduced further reforms, and plots over 3 hectares were seized by the government and redistributed. The land reforms proved highly successful. Tenancy declined sharply over a brief period of time. By 1954, approximately 90% of farmers either fully or partially owned the land they cultivated. Following the land reform, levels of land inequality remained low due to institutional support for smaller farms (De Janvry, 1981b) [4]. The Gini coefficients for Korea's land inequality were estimated at 0.35 in 1961 (Deininger and Squire, 1998), 0.31 in 1970 and 0.37 in 1990 (Frankema, 2005)[5].

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[4]Following the land reform, the Korean government supported small farmers using various policies. First, the government implemented a payment plan that gave tenants advantages in purchasing land. According to the plan, tenants that purchased redistributed land were required to pay the landlords 1.5 times the annual yield over five years. In many cases, the government extended the repayment period to eight years. Moreover, during the first half of the 1950s, the government imposed price controls for tenants/new owners' payments to landlords. The regulated price for rice was significantly lower than its market price, which redistributed income from the larger landlords to smallholding peasants purchasing new plots of land (Jeon and Kim, 2000). Second, during the first half of the 1960s, the Park Chung Hee government increased irrigation investments and implemented a debt reduction program for peasants (Burmeister, 1992).

[5]Land Gini coefficient values for Korea indicate the inequality in the disposable land per farm rather than inequality in land ownership

This ensured that agricultural inequality remained low. The Gini coefficient for agricultural income inequality fluctuated around 0.30 during the period 1965-1993 (Table 3.4).

3.2.3 Turkey

The Turkish case could be considered to have substantial similarities with development experiences in Latin America. During the period 1962-1979, Turkey experienced substantial industrial development through Import Substitution Industrialization (ISI) policies focusing on the domestic market. The ISI policies represented an important basis for further industrialization; however, they were incapable of producing high-quality goods that could compete in global markets. Similar to Latin American cases, this issue was addressed with the implementation of trade liberalization policies after 1980.

Turkey's history of industrialization is similar to those of Latin American countries; however, Turkey's agrarian structure differs significantly. According to Keyder (1983, 1987), Turkish agriculture is historically characterized by the predominance of an independent, small-scale peasantry. Landless peasants do not represent an important category in rural Turkish society[6]. Nevertheless, Turkey's agrarian structure is not entirely egalitarian. Turkey's land Gini coefficients are estimated within the range of the 0.60-0.70s in agricultural surveys (Table 3.7). Accordingly, income inequality is higher in Turkey than that in Korea and lower than that in Brazil (Table 3.6). Thus, Turkey is included in this study as an intermediate case between Brazil and Korea.

Keyder's claim regarding the dominance of small-scale peasantry, noted above, is also supported by statistics indicating that most peasants in Turkey cultivate their own land. However, three considerations help explain why Turkey's rural sector is not entirely egalitarian. First, a semi-feudal structure persists in southeastern Anatolia, where the relations of production differ from those in the rest of the country. Southeastern Anatolia is host to tribal leaders and large landowners called *ağa*s (Aydın, 1986). *Ağa*s are not merely landowners, but they also exercise authority over peasants beyond their economic power. Peasants serve as corvee labor and are required to perform other duties assigned by the

[6]The share of landless peasants in Turkey was 14% in 2002 (Ünal, 2012)

ağa. If they refuse to comply, the *ağa* will either expel them from the village or mistreat them. Peasants typically cultivate the *ağa*s' lands through various forms of sharecropping agreements; landless agricultural laborers also work on the *ağa*s' lands as wage laborers.

Second, by engaging in usurious lending practices, moneylenders have expropriated an important share of small-scale peasants' surplus (Boratav, 1969). Köymen (2008) asserts that usurious lending also significantly affected the distribution of land. Many of the peasants who cannot pay their loans are forced to sell their land to large landowners.

Third, studies on Turkey's past agrarian structure indicate that large-scale capitalist farms existed in the Aegean and Mediterranean regions (Köymen, 1981; Kıray, 1999)[7]. These farms generally produced export crops such as cotton and tobacco. The land distribution statistics for 1950 reflect the presence of large-scale farms in these regions (Table 3.7). However, Akşit (1999) observes that the villages where capitalist farms existed have become more egalitarian over time. Some of the large farms were divided among the children and relatives of the landlords. These farms were divided into smaller parcels and became medium-sized capitalist farms. The sharecroppers in the villages owned their land and became petty commodity producers. This is consistent with the decline in land inequality between 1950 and 1970 and the reduction in rural inequality after 1973 (Table 3.6). However, some of this decline might actually reflect data issues. For example, the extreme inequality in the Mediterranean region and its rapid decline must be interpreted with caution.

Next, this chapter examines the relationship between land and income inequality in Turkey, Brazil and Korea. We first discuss the role played by institutions and educational inequality in this relationship. Then, we examine how land inequality might affect income inequality through its effects on the level of urbanization.

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[7]Köymen's (1981) study considers the earlier years of the Turkish Republic (1923-1938). Kıray (1999) examines the relations of production in Mediterranean villages at the beginning of the 1970s.

3.3 Impact of education inequality

3.3.1 Theoretical framework.

The effect of the distribution of land on education is an important characteristic that distinguishes the urban or nonagricultural income inequality in Korea from that in Brazil and Turkey[8]. An unequal distribution of land can influence urban income inequality through two channels. In low-income societies with inegalitarian agrarian structures, lower income families might wish to have their children educated; however, they may be unable to invest in education due to credit constraints (Galor and Zeira, 1993). When these families have access to credit markets, the marginal returns to education might be minimal for the lower levels of schooling. This reduces poor families' incentives for investing in education (Galor and Tsiddon, 1996). Economic growth reduces the credit constraints on schooling, in so far as the average income for low-income households also increases. Nevertheless, improvements in educational outcomes are slower in unequal societies because the marginal returns realized by low-income households are expected to be lower.

To alleviate poor educational attainment, the state typically pursues remedies in an attempt to expand educational attainment through public investment. Nevertheless, public investments in education also depend on distribution of power among peasants, landlords and urban capitalists. This relationship was initially identified by Bowles (1978), who argued that large landlords perceive little benefit in expanding educational outcomes. The expansion of educational outcomes would provide peasants with greater opportunities to exit the traditional rural sector, which is undesirable for the large landlords because it limits the availability of an inexpensive labor force in the rural sector. Conversely, urban capitalists benefit from the growth of a relatively skilled labor force and share an interest in promoting public education. Thus, as a society becomes urbanized, capitalists enjoy increased power, and public investment in education accelerates.

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[8]The urban income inequality data for Brazil, Turkey and Korea are not entirely comparable. We have urban income inequality data for Brazil and Turkey; however, only nonagricultural income inequality is reported for Korea. For this study, I use the nonagricultural income inequality in Korea as a proxy for urban income inequality.

Galor, Moav and Vollrath (2009) also suggest that land inequality negatively affects the emergence of public education. In societies with an unequal distribution of land, a greater proportion of educational expenditures is financed through taxes levied on large landlords. This would encourage large landlords to block the expansion of public education. Nevertheless, large landlords would begin to accept the state's investments in education as the urban sector grows and urban capitalists finance a greater share of public education expenditures. However, in societies with inegalitarian land distributions, the expansion of the education frontier can lag.

Although Galor, Moav and Vollrath (2009) complement the analysis of Bowles (1978), their model generally fails to address power imbalances, which might be an important factor. In Galor, Moav and Vollrath's model, all landlords, peasants and urban capitalists should support expanded education, independent of the land distribution structure or the share of the urban economy in the total economy. However, the impact of these groups on state policy depends on distribution and size of the urban sector, as demonstrated in several case studies (Engerman and Sokoloff, 2005; Frankema, 2009; Wegenast, 2009).

In their comparison between the US and Latin America, Engerman and Sokoloff (2005) highlight that the lower degree of wealth inequality in the US contributed to the earlier increase in political participation relative to Latin American countries. The political franchise expanded earlier in US states with lower levels of inequality than in more unequal US states. Engerman and Sokoloff also assert that the unequal distribution of land in Latin America allowed the large landlords to dominate the political process. Therefore, in Latin American countries, political participation in elections was generally restricted to large landlords during most of the 19th century. The result of these restricted elections was the development of exclusive institutions that block egalitarian policies, such as the expansion of public education. This led to a delay in the growth of public primary education in Latin American countries.

In addition, Frankema (2009) holds that in majority of the Latin American countries, state expenditures on primary education continued to be insufficient during the 20th century. Latin American countries only began to address the shortcomings in their primary education systems in the 1980s. Moreover, in contrast to Galor, Moav and Vollrath (2009), Frankema

notes that the poor quality of primary education is not the result of a lack of public resources, but rather Latin American states' substantial bias in favor of public spending on tertiary education. The public resources allocated to education are directed to educating the children of wealthier families to the detriment of the education of poor children. This is a result of the high levels of land inequality in Latin America, which reduce poor families' political influence.

Wegenast's (2009) empirical analysis of a number of developing economies is also consistent with the conclusions highlighted by Frankema. In a cross-country analysis, Wegenast demonstrates that the shares of individuals with no formal education and higher education increase, while the share of individuals with basic education declines, as plantation-type agrarian structures become more dominant[9]. Moreover, Wegenast reports that the dominance of plantations reduces public expenditures on secondary education. Similarly, in a study of India, Banerjee and Iyer (2005) demonstrate that primary and secondary school completion increases in states where the share of land held by individual cultivators and collectives are higher. Banerjee and Iyer also report that the share of land held by individual cultivators and collectives also has positive effects on high school completion rates; however, the impact is weaker than the positive impact of agrarian structure on primary schooling.

3.3.2 Education inequality in Turkey, Korea and Brazil

An egalitarian agrarian structure is also an important factor in the rapid expansion of educational opportunities in Korea and contributed to the differences between Korea's Gini coefficient and those of Brazil and Turkey. Korea's 1948 land reform not only increased the share of land held by poor households and allowed them to invest in education, but it also eliminated the political power of feudal landlords (Griffin, Ickowitz and Khan, 2002), who might have otherwise hampered or blocked the state's educational investments in rural areas. Thus, the land reform created favorable conditions for reducing the education gap

[9]Wegenast (2009) employs the export share of plantation crops as a proxy to measure the extent to which plantations or small holdings dominate a country's economy. This is very similar to Easterly's (2007) approach, which uses the ratio of land suitable for sugar to that suitable for wheat as a proxy for the share of land held by small landholders.

in the country. Conversely, the agrarian structures in Brazil and parts of Turkey created politically powerful rural elites who do not favor educational investments in rural areas. As we discuss in this section, the elevated levels of rural poverty resulting from an unequal distribution of land represent an important impediment to educational expansion.

Figure 3.1 depicts the potential influence of the land reform on the expansion of education in Korea. However, the data for Korea are not entirely compatible with those from Turkey and Brazil. In Figure 3.1, the pre-1942 data indicate the average years of schooling for both North and South Korea, whereas the post-1955 data only reflect the average years of education in South Korea. Nevertheless, it is possible to draw conclusions from Figure 3.1, as what would become South Korea was not more developed than what would become North Korea as of the beginning of the 1940s[10]. Moreover, the average years of education in Korea in 1955 is not entirely distinguished from the trend in education in pre-1942 Korea.

Figure 3.1 indicates that years of education in Korea, Turkey and Brazil exhibited similar trends prior to 1942. Following the Korean land reform, the expansion of education in Korea increased significantly. During the period 1920-1940, the average years of schooling in Korea, Turkey and Brazil grew by 0.024, 0.012, and 0.027 years on average, respectively. During the period 1955-1975, education in Korea expanded significantly more rapidly, and the mean growth in the average years of schooling in Korea, Turkey and Brazil was 0.172, 0.118, and 0.058, respectively. By 1959, the average years of schooling in Korea already exceeded the corresponding figures for Brazil and Turkey. Thus, the expansion of education in Korea may have been a result of the land reform rather than the Japanese rule in Korea. Moreover, Korean GDP per capita exceeded those of Turkey and Brazil by approximately 1980 (Figure 3.2), which indicates that the improvement in Korean education cannot merely be explained by its rapid economic growth.

[10]Park (1999) notes that labor relocated from the poor, rice-growing southern provinces to northern industrial centers during the 1930s and early 1940s. Most of these growing industrial centers were located in contemporary North Korean provinces such as Kyongsong, South Hamgyong, North Hamgyong, Pyongyang-Chinnamp'o, Hungnam-Hamhung and Ch'ongjin-Najin. Following the WWII and the Korean War, South Korea became slightly richer. By 1953, South Korean per capita income was 39% higher than that of North Korea (Kang, 2002). In the 1960, North Korea's GNP per capita surpassed South Korea's and remained at a higher level until the mid-1970s.

Figure 3.3 below depicts the historical development of education inequality in Korea, Turkey and Brazil. As a result of economic development, the education Gini coefficients[11] in all three countries decline over time. Nevertheless, the education Gini coefficient was significantly lower in Korea than those in Brazil and Turkey throughout the period 1960-2010. Thus, these figures are consistent with our claims on Korea above. The education Gini coefficients might be correlated with per capita income[12]. Figure 3.4 helps us to examine the changes in education Gini coefficients by controlling for the impact of per capita income. Figure 3.4 depicts two outcomes. First, at a given level of GDP per capita, the education Gini coefficient in Korea is lower than those in Brazil and Turkey. Second, the education inequalities in Turkey and Brazil have a much steeper relationship with GDP per capita. A possible explanation for this is that the negative influence of large landlords declined as Turkey and Brazil urbanized. Thus, as in Bowles (1978) and Galor, Moav and Vollrath (2009), in addition to GDP, the growth in the urban economy's share of total GDP might function as a second factor alleviating the impediments to education spreading.

Wegenast (2010) examines the impact of land distribution on Brazil's educational inequalities in detail. According to Wegenast, Brazil's relatively equal states, Santa Catanina and Espirito Santo, are also those that implemented the first educational reforms in the late 19th and early 20th centuries and historically placed greater emphasis on the public education system. This may be a result of a lower degree of political influence exercised by latifundistas in these states. Moreover, in a cross-sectional analysis between states, Wegenast demonstrates that higher land inequality in the period 1995-1996 has a significant negative effect on Brazilian states' population shares enrolled in secondary education in 2000. In addition, the analysis examines the impact of the political representatives of agrarian elites (*bancada ruralistas*) on per capita education expenditures in each state. Con-

[11]The education Gini coefficients come from the education inequality dataset developed by Benaabdelaali, Hanchane and Kamal (2012). They measure educational inequality in years of schooling.

[12]The correlation between the education Gini coefficient and GDP per capita will be discussed in greater depth in this dissertation's essay on the Kuznets Curve. Briefly, the Pearson correlation coefficient between GDP per capita and the education Gini coefficient is -0.609, which is a somewhat strong correlation.

trolling for other factors, the estimates indicate that greater representation of agrarian elites in the parliament and senate reduces per capita educational expenditures.

Turkish landlords also enjoy a strong institutional influence in more unequal regions, particularly in southeastern/eastern Anatolia. Similar to Brazil, the semi-feudal landlords - *ağa*s - or representatives of certain tribes/families become involved in politics to strengthen their hegemony (Beşikçi, 1969). Many of these landlords have served as deputies in the Turkish parliament (Özer, 2000; Ateş-Durç, 2009)[13]. Turkish political parties attempt to earn the support of *ağa*s in elections because the *ağa*s are capable of delivering the votes of individuals living in their villages. *Ağa*s generally support the party that offers them the most substantial favors and services (Leder, 1979); they often disregard ideological differences between parties when making their political decisions. As expected, *ağa*s demand infrastructure investments such as roads, dams, irrigation channels or subsidized credits from politicians. They exploit their political connections as a means of increasing their profits (Beşikçi, 1969); public education and healthcare investments are not included in the *ağa*s' political agendas. Thus, in provinces with unequal land distribution, large landlords are able to influence public expenditures in favor of their interests, which comes at the expense of a larger part of population. Nevertheless, the political influence of large landlords has declined in recent years as the urban population share increased in the majority of Turkey's provinces (Özer, 2000).

3.3.3 An empirical analysis on Turkey

In this study, I undertake an empirical analysis similar to Wegenast's (2010) to explain the influence of large landlords and the distribution of land on variations in educational expenditures and years of schooling in Turkey. The analysis examines whether land inequality in various provinces reduced student-teacher ratios in primary and secondary education. Moreover, I also assess the impact of land distribution on secondary schooling rates. In a middle-income country such as Turkey, secondary education rates might be a good measure

[13]Many of these landlords also have strong political ties with important politicians in Turkey. An example of such a landlord is Kinyas Kartal. Kartal had a personal connection with Süleyman Demirel, who served as prime minister for 10 years and president for 7. Ahmet Özer (2000)- a sociologist studying Kartal's tribe, mentions a visit that he and Kartal paid to Demirel's home.

of the extent of education. In Turkey, primary education was mandatory during the period examined, and primary education enrollment rates were already high in all provinces[14]. The education variables all come from the 2011/2012 academic year. The land Gini coefficient is used to control for the distribution of land in each province. The provincial land Gini coefficients are the result of my calculations using the agriculture survey of 2000/2001 (Turkstat, 2013) covering 81 provinces. The data from 2000/2001 are the latest data available on the distribution of land in Turkey.

Figures 3.5 and 3.6 depict the negative relationship between the land Gini coefficients and the number of teachers (per 100 students) in primary and secondary schools. This negative relationship indicates that the Turkish state might not have invested in education in provinces where the distribution of land is highly unequal and large landlords are more politically dominant. Nevertheless, provinces characterized by high levels of land inequality are also generally less developed. Therefore, my analysis controls for various other factors such as the level of urbanization, GDP per capita and population density. The data used to construct these variables from all provinces also come from Turkstat (2013). To address the potential for reserve causality, data from the year 2000 are preferred[15]. Wealthier provinces would likely have exhibited stronger demand for education. Thus, GDP per capita is expected to have a positive effect on educational investment and the rates of secondary schooling. Greater population density is a possible impediment to educational expansion, as greater agglomeration in an area might increase class sizes. The effect of the level of urbanization on education is ambiguous. The "lights of cities" might increase educational opportunities within the provinces, as hiring skilled schoolteachers is facilitated in cities. Nevertheless, increased urbanization might also reduce the number of teachers per student, as substantial agglomeration in cities entails increases competition for school places and class size. A possible decline in the quality of education might also reduce secondary schooling rates.

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[14]Net enrollment in primary education is over 95% in all provinces except Van, Tokat and Yozgat, which have enrollment rates of 86%, 94%, 94%, respectively. (Turkstat, 2013)

[15]Moreover, after 2002, Turkstat began to publish regional GDP values rather than provincial ones. Nevertheless, I preferred the GDP data from 2000, as Turkey experienced an economic crisis in 2001.

Finally, the analysis controls for the Kurdish conflict, which might impede the spread of education. Many assert that areas dominated by the Kurdish population suffer from a lack of public investment[16]. Moreover, it is also reasonable to assume that the conflict between the Turkish state and PKK (Kurdistan Workers' Party) is an impediment to the development of Kurdish provinces. As a proxy for the extent of the Kurdish conflict, I used a dummy variable for the provinces in which the Democratic Society Party (DEHAP) - a political party associated with the Kurdish guerilla movement PKK[17] - received over 10% of the votes in the 2002 elections. When measuring DEHAP's vote share, an earlier year is preferred in an attempt to mitigate reverse causality.

Table 3.8 reports the estimates for the education variables. The first four regressions examine the factors affecting the average number of teachers per 100 primary and secondary school students. As expected, the land distribution has a significant and negative impact on the average number of primary and secondary school teachers. Thus, our empirical analysis is consistent with the argument that the political power of landlords reduces public investment intended to expand education. GDP per capita has the expected positive sign, while population density has a negative sign, both of which are significant at 5%. This indicates that class sizes might have increased as a result of population pressures.

In the regression on the average number of primary school teachers, the DEHAP dummy is only significant at the 10% level; nevertheless, it is significant at the 5% level for the regressions assessing the factors affecting the average number of teachers in secondary schools. Thus, the Kurdish provinces are disadvantaged with respect to public education investment,

[16]A possible example of is the speech by the co-chair of the Peace and Democracy Party (BDP), Gülten Kışanak, in the Turkish parliament. According to Kışanak, "people living in the provinces dominated by the Kurdish population struggle with severe poverty along with the devastation created by severe war conditions...The provinces where Kurds live are also the ones that perform the worst in terms of socioeconomic development, and this situation hasn't at all changed since 2002, when the Justice and Development Party (AKP) was elected. Some might give us numbers. They can say that 'we sent this amount of money, we made this amount of public investment, we constructed this number of dams, this amount of two-lane roads'. However...nothing in our lives has changed". (GNAT, 2013)

[17]In 2009, the Constitutional Court of the Republic of Turkey banned the political activities of the Democratic People's Party (DEHAP) by charging the party with "supporting the terrorist activities of PKK". The majority of DEHAP's members remain active in politics through the Peace and Democracy Party (BDP) and People's Democratic Party (HDP), which were formed after the ban on the DEHAP was imposed.

but their disadvantage is more marked in secondary education. The relatively better conditions in primary schooling may reflect Turkish government education subsidies, which primarily target primary education (Keyder and Üstündağ, 2006). The significance of the coefficients on the level of urbanization is very low and its signs are negative. This may be due to limited number of places available in cities with larger populations.

The last two regressions in Table 3.8 examine the factors affecting the net rates of secondary schooling. The coefficients for provincial Gini coefficients, GDP per capita, population density and the DEHAP dummy are all significant at the 5% level and have the same signs as in the previous regressions. The results of the analysis indicate that greater levels of land inequality in Turkey not only decrease the number of teachers but also reduce the schooling rates in Turkey's provinces. Thus, high levels of land inequality appear to contribute to the rise in income inequality in Turkey by constraining both the quality and the quantity of education. Moreover, factors such as population density and the Kurdish conflict might represent impediments to increasing secondary school enrollment rates by reducing the quality of education at the primary and secondary levels.

3.3.4 Comparing education inequalities in Turkey and Brazil

A question that needs to be addressed is Turkey's higher level of educational inequality compared to Brazil. Indeed, we should expect Turkey to exhibit lower levels of education inequality, as even Diyarbakır - which has the least egalitarian land distribution in Turkey - has a land Gini coefficient below those in most of Brazil[18]. The higher level of educational inequality in Turkey is a result of two factors. First, compared to Brazil, Turkey has a substantial gender gap on education (Table 3.9). In Turkey, the average years of schooling for females were 0.73 lower than the national average in 1960, 1.00 in 1980, and 0.87 in 2010[19]. However, the gender gap in educational attainment is lower in Brazil. During

[18] According to Köymen (2008)'s estimates, the land Gini coefficient in Diyarbakır was 0.714, which is only greater than the land Gini coefficients in 5 of the 20 Brazilian regions. Moreover, the most equal Brazilian region, Santa Catarina, has a land Gini coefficient of 0.643; this value is still higher than the overall land Gini coefficient for Turkey. The values for Brazilian land Gini coefficients are for the year 1992.

[19] In Turkey, the gender gap in education may also be the result of a vicious cycle between lower levels of women's education and women's lower labor force participation. According to the ILO (2013)'s data

the period 1950-2010, the average years of schooling for females in Brazil are at most 0.17 lower than the national average and exceeds the national average by 0.15 in 2010. The large gender gap may not be reflected in the income Gini coefficients because the income Gini coefficients we use reflect the inequality between households rather than the inequality between individuals. Figure 3.7 only displays education Gini coefficients for men. Figure 3.7 indicates that the education Gini coefficients are slightly higher in Brazil when only males are considered.

A second reason that overall education inequality in Brazil is lower than in Turkey is Brazil's institutional preference for educational expenditures. As a share of GDP, public education expenditures in Brazil are significantly higher than in Turkey and even those of Korea (Figure 3.8) in the majority of the years for which Brazilian data are available.

The overall ratio of public education expenditures in GDP is an important measure of educational opportunities; however, it cannot provide a complete explanation for educational inequality. Birdsall, Bruns and Sabot (1996) note that while Brazil's public education expenditures are high, relative to Korea they are highly biased towards tertiary education. This is also reflected in Table 3.10, which reports public expenditures per student/GDP per capita ratios in primary, secondary and tertiary education. For tertiary education, the public expenditures per student/GDP per capita ratio is clearly higher in Brazil than in Korea. However, the same ratio is significantly larger for primary and secondary education. Thus, Brazil's public expenditures are biased in favor of a smaller, elite segment of the population, whereas Korea's public education policies prioritize the expansion of education to a greater extent. However, a similar comparison cannot be made between Brazil and Turkey. The ratio of public expenditures per student to GDP per capita is smaller in Turkey than in Brazil at all levels.

The institutional preference for higher public education expenditures may be a result of Brazil's higher level of urbanization. The returns to education are greater for urban residents; therefore, it is possible a larger share of the Brazilian population demands education

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on 181 countries, Turkey has the nineteenth-worst ranking in terms of the ratio of female-male labor force participation rates.

investments. Moreover, the political influence of large landlords is lower in more urbanized societies. Urban capitalists who benefit from improving human capital do not tend to exert their political influence to block public investments in education (Bowles, 1978; Galor, Moav and Vollrath, 2009).

Figures 3.9 and 3.10 depict the impact of urbanization. Figure 3.10 plots the relationship between the level of urbanization and the education Gini coefficients, with respect to years of schooling, for the male population. The levels of education inequality are higher in Brazil and lower in Korea, which is consistent with theories regarding the influence of land distribution on education inequality. As discussed in the following section, a more unequal distribution of land leads to a higher level of urbanization. Therefore, urbanization may reduce inequalities in the distribution of land inequality and thereby reduce education inequality in Brazil, at least with respect to years of schooling, which dampened the impact of the education channel. Nevertheless, a higher level of urbanization leads to higher income inequality in Brazil through another channel- expanding the urban reserve army of labor.

Although Brazil's public education expenditures are greater than those in Turkey and similar to those in Korea, Brazil's education Gini coefficient for males is the largest of these three countries (Figures 3.7 and 3.10), and its overall education Gini coefficient is only slightly lower than Turkey's (Figure 3.3). Compared to Korea and Turkey, educational expenditures in Brazil are inefficiently allocated, potentially due to its high level of land inequality. Therefore, land inequality might affect educational inequality regardless of institutional preferences. While public education expenditures are large at every level of education, inequality might nevertheless reduce the poor population's ability and/or incentives to invest in education and hamper the expansion of education (Galor and Zeira, 1993; Galor and Tsiddon, 1996).

Figure 3.11 plots the relationship between per capita education expenditures and the average years of schooling in Korea, Brazil and Turkey. Because there are diminishing returns to education expenditures (at least with respect to years of schooling), more unequally distributed education expenditures and opportunities lead to lower years of schooling for a given level of education expenditures. Figure 3.11 suggests that Korean education spending is the most effective in terms of increasing the average years of schooling. This also may

be an outcome of the more egalitarian distribution of educational opportunities in Korea being enhanced by low land inequality. Figure 3.12 also indicates that the education Gini coefficients are highest for Brazil and lowest for Korea for a given level per capita education expenditures when only the male population is considered. This is consistent with my hypothesis regarding the relationship between education inequality and land inequality.

3.3.5 The impact of land inequality on the quality of education

Another aspect that that has received relatively less attention in the literature is the influence of land inequality on inequalities in educational quality. Birdsall, Bruns and Sabot (1996) note that the educational quality is a particularly important issue in Brazil. During the period 1950-80, despite rising primary enrollment rates, the quality of primary education in Brazil decreased, as reflected in the high dropout rates. They argue that grade repetition rates are a good measure of educational quality and indicate that the Brazilian primary school completion rate (for eight grades) decreased from 60.1% in 1950 to 19% in 1980.

Ferreira and Gignoux (2011) construct an "Inequality of Educational Opportunity" measure to estimate inequalities in the quality of education. The data for the measure are based on OECD student test scores collected under the Program of International Student Assessment (PISA). Students of approximately 15 years of age in many countries take these tests, and scores on these tests represent an important source of information on education quality. Table 3.11 reports the PISA scores for Korea, Turkey and Brazil for the year 2006. Consistent with our previous predictions, inequalities in the quality of education are highest in Brazil and lowest in Korea for all subjects. Ferreira and Gignoux also separately assess the reasons driving inequality in the quality of mathematics education. Unfortunately, they do not consider the impact of land distribution, but they do analyze the effect of inequality in the ownership of durables, which is another important measure of the distribution of wealth. Of the three countries in Table 3.11, the contribution of durables on Inequality of Educational Opportunity is the most marked for Brazil. As expected, the high level of inequality in durables is an important impediment to standardizing the quality of education in Brazil, which suggests that the inequality of land ownership might also affect the quality gaps in Brazilian education.

3.4 Impact of urbanization

3.4.1 Theoretical framework

The influence of land inequality on income inequality can also be observed through the urbanization channel. This channel can explain why income inequality is greater in Brazil than in Turkey, both overall and in urban areas in particular. In the previous paper of this dissertation, we observed that inegalitarian agrarian structures would exert downward pressure on the urban capitalist wages by leading to increases in the urban subsistence sector. In brief, the inequality-augmented form of the Harris-Todaro model can be written as

$$\frac{g(h(L_U),K)}{L_U}h(L_U)+\frac{Y_S}{L_U}-S_R(\beta)-C=0,\frac{dS_R}{d\beta}>0 \tag{3.1}$$

where K is the amount of capital in the urban capitalist sector, h is an employed migrant's wage, g is urban employment, Y_S is total urban subsistence income, L_U is the urban labor force, S_R is peasants' pre-migration returns, β is the share of land held by large landowners and finally, C is the cost of migration from rural to the urban areas. Considering the following conditions,

$$h^{'}<0,\ g_1<0,\ g_2>0 \tag{3.2}$$

we demonstrated that as the share of land held by large landowners increases, a greater number of rural dwellers will driven into the urban sector[20] provided that the wage elasticity of labor demand is greater than -1:

$$\frac{dL_U}{d\beta}=\frac{L_U^2}{-Y_S+h'(g_1h+g)L_U-gh}\frac{dS_R}{d\beta}>0 \tag{3.3}$$

This would lead to a larger urban subsistence sector, which functions as a reserve army of labor for the urban capitalist sector (Patnaik, 2008; Hart, 1973; Williams and Tumusiime-

[20]The decline in the share of land held by large landlords increases median peasant incomes by not only reducing inequality, but also by increasing mean land productivity. Ünal (2012), Thiesenhausen and Melmed-Sanjak (1990) and Jeon and Kim (2000) demonstrate that land productivity is higher for smaller farms in Turkey, Brazil and Korea, respectively.

Mutebile, 1978). A larger reserve army of labor also drives down wage shares in the urban capitalist sector. A larger share of the urban subsistence sector and a lower wage share in the urban capitalist sector lead to greater income inequality.

The model assumes that the reserve army of labor only comprises the population employed in the urban subsistence sector. Nevertheless, many Marxian scholars such as Davis (2006) and Foster, McChesney and Jonna (2011) suggest that part-time/irregular employees functions as a reserve army of labor for the urban capitalist sector, as part-time/irregular workers seek regular employment. Thus, this chapter also examines the possible relationship among land inequality, part-time employment and income inequality.

Next, this chapter examines whether the main argument in the previous chapter explains the differences in income inequality across Turkey, Korea and Brazil. According to the data, the model partially explains the differences in income Gini coefficients between Korea and Turkey and Brazil. Nevertheless, the model only partly explains the difference between Turkey and Korea. The reasoning behind this limitation of the model are discussed by focusing on Korea's higher capital intensity and other country-specific characteristics.

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3.4.2 Urbanization in Korea, Turkey and Brazil

The relationship among urbanization, income inequality and land inequality has been discussed in several studies covering Turkey, Brazil and Korea. For Brazil, there is a strong opinion suggesting that the inegalitarian land structure increased urban income inequality by driving rural dwellers into the cities (De Janvry, 1981a; Harris, 1978). In "Asia's Next Giant", Amsden (1989) claims that due to the egalitarian land distribution and sharp rises in the agricultural productivity in Korea, "rural urban migration and downward pressure on manufacturing wages can be assumed to have been less massive than it would otherwise have been". Thus, she suggests that land inequality is an important factor reducing urban inequality in Korea.

Various arguments have been advanced regarding the impact of the agrarian structure on the urban distribution in Turkey. Keyder (1989) contends that the predominance of small-scale peasantry in the agrarian structure exerted upward pressure on urban wages. He argues that "the marginal product of the rural migrant was certainly not high, but he always had the option of remaining in the countryside with a guaranteed average product, and sharing the household's income. Wages in the city therefore had to be high enough to induce the peasant - who was not being pushed out - to accept urban employment".

Nevertheless, numerous others (e.g., Köymen, 2008; Önal; 2010) contend that Turkey's agrarian structure is not entirely egalitarian and the average Turkish peasant is often "poor" and being driven into the urban sector. Gürel (2011) argues that Turkey's agrarian structure does not provide sufficient returns, which exerts "downward pressure on wages". Gürel entirely discounts the impact of land distribution and attempts to explain increases in urban wages in Turkey through the working-class struggle in the 1960s and 1970s.

A comparison of the three countries' data is useful for understanding the reasons for the levels of income inequality exhibited in each country. Figure 3.13 plots the level of urbanization (%) in Turkey, Brazil and Korea for the period 1960-2010. As the figure shows, in the period 1960-2010, the level of urbanization in Brazil has been greater than the level of urbanization in Turkey. This is important because both countries had similar

GDP per capita levels during this period (Figure 3.2). Thus, the difference between levels of urbanization might be a result of Brazil's higher level of land inequality.

As depicted in Figure 3.13, Korea's urban population share exceeded Turkey's in 1967 and reached Brazil's urban population share in approximately the 1990s. Moreover, during the period 1960-2010, Korea grew significantly more rapidly than Turkey and Brazil. Figure 3.2 depicts GDP per capita for the three countries and clearly reflects "the Asian Miracle" experienced in Korea. As an outcome of high growth rates, the pace of urbanization was higher in Korea than in Turkey and Brazil.

To account for the impact of GDP per capita, I use Figures 3.14 and 3.15, which depict the relationship between GDP per capita and the level of urbanization for the three countries[21]. In these figures, I use Hodrick-Prescott (HP) filtered values to depict long-term trends rather than temporary changes.

Figures 3.14 and 3.15 reveal that the share of Korea's population in the urban sector increased in keeping with the growth in GDP per capita. Nevertheless, both Turkey and Brazil had substantial waves of urbanization, even during periods when growth in per capita income levels was relatively slow. Specifically, urbanization in Brazil continued from 1980 to the mid-1990s, a period in which Brazilian GDP per capita did not increase (Figures 3.2 and 3.13). This period is also observable in Figure 3.15, where the share of the urban population in Brazil is vertically increasing approximately $6000. In the first half of the 1980s, Turkey also urbanized significantly more rapidly relative to its change in per capita income. This may be a result of the neoliberal agricultural policies implemented after 1980. These policy measures include reductions in state-subsidized purchases, agricultural credits grated by public-owned banks and declines in fertilizer and fuel subsidies (Önal, 2010; Çalışkan and Adaman, 2008). The impact of neoliberal policy measures is clearly reflected in Figure 3.16, which indicates that the agricultural-nonagricultural terms of trade declined significantly in the first half of the 1980s. During this period, the relationship between the level of urbanization and GDP per capita becomes relatively vertical at approximately $5200-5400 per capita (Figure 3.15).

[21] Figure 3.15 is intended to emphasize the difference between Turkey and Brazil.

Figures 3.14 and 3.15 indicate that for a given level of GDP per capita, urbanization is higher in Brazil than in Korea or Turkey. This might be related to the higher level of land inequality in Brazil. As in our model, the high land inequality in Brazil might have driven peasants into the urban subsistence sector, which functions as a reserve army of labor for the urban capitalist sector. As a result, the high degree of land inequality in Brazil might translate into urban income inequality by expanding the share of the population in the urban subsistence sector and reducing wage shares in the urban capitalist sector. Moreover, as the agrarian structure in Brazil is dominated by latifundios, labor-saving technical changes might have driven greater proportion of rural dwellers into the urban areas (De Janvry, 1981a; Harris, 1978).

Nevertheless, at a given level of income per capita, the levels of urbanization were lower in Korea than they were in Turkey (Figure 3.14). This can be explained by Korea's capital intensity. Compared to Brazil and Turkey, Korea experienced a significant shift towards capital-intensive activities in the nonagricultural sector. The structural shift towards these activities is primarily a result of the Korean government's strong emphasis on promoting heavy industries, which was also underlined in Korea's five-year plans during the period 1972-86 (Kim, 2008). According to Amsden's (1989) estimates, Korean heavy industries were less profitable on average than light industries at the beginning of the 1970s. However, the Korean government created incentives for investing in capital-intensive heavy industries through policies such as direct subsidies, cheapcredits and trade protection for industries including shipbuilding, steel and automotives.

The industrial policies in Korea resulted in significant increases in capital intensity. Figures 3.17 and 3.18 report the capital/labor and capital/output ratios, respectively, for Korea, Turkey and Brazil. The capital stock data come from Marquetti and Foley (2012)'s Extended Penn World Tables 4.0. Both the capital/labor and capital/output ratios clearly demonstrate that Korea experienced a rapid structural shift towards capital-intensive sectors. This structural change is more marked beginning in the 1970s, the period in which capital-intensive industries in Korea were heavily subsidized.

Growth in capital-intensive activities increases average formal wages in the urban sector; however, at a given output level, fewer formal urban jobs are created in countries with higher

capital/output ratios. Nevertheless, increases in capital intensity promote rural-to-urban migration by increasing expected returns in the urban sector. Many of these migrants are employed in informal/traditional activities or/and part-time jobs and wait to be employed in better jobs. This can also be represented using the inequality-augmented Harris-Todaro equation that follows the urban capitalist/urban traditional divide:

$$\frac{dL_U}{dK} = \frac{(g_2 h)L_U}{-Y_S + h'(g_1 h + g)L_U - gh} > 0 \tag{3.4}$$

Ceteris paribus, an increase in the capital stock increases the urban capitalist wages and drives a larger share of the population to urban centers.

The interpretations of the results of this equation are also consistent with the Amsden's empirical data. According to Amsden, during the period 1970-84, manufacturing wages in Korea and Turkey increased by 176% and 11%, respectively. During the same period, per capita income increased by 140% in Korea and 32% in Turkey. Thus, unlike in Turkey, Korea's wages increased to a greater extent than per capita income between 1970 and 1984. Moreover, both Yun (2011) and Amsden (1989) note that Korea had a large share of self-employed individuals in the urban sector.

3.4.3 The size of urban reserve armies

Next, we examine the shares of the urban subsistence and informal and part-time activities that are argued to function as a reserve army of labor. Following our framework, we expect Brazil to have a significantly larger urban reserve army of labor compared to Turkey, which may lead to greater income inequality in Brazil than in Turkey. In the previous section, we noted that the level of urbanization in Korea is high due to its high capital intensity, and the impact of these factors should be reflected in informal, subsistence and part-time employment.

In this section, nonagricultural informal employment is defined as the share of workers employed in the non-agricultural sector and lacking any social security protections. I use the same definition for Brazil and Turkey to make an accurate comparison. Informal employment data are not available for Korea. Figure 3.19 suggests that Turkey and Brazil's nonagricultural informal employment shares depict an inverted U-shaped path, which is con-

sistent with Rauch (1993) and Elgin and Oyvat (2013). Nevertheless, the level of informal employment is between 6 and 22% larger in Brazil.

Next, I use two proxies for the size of the subsistence sector. The first measure is the non-agricultural share of self-employed and unpaid family workers. This is also termed the share of "vulnerable employment" by the ILO (2013). Turkstat (2013) and Cepal (2013) report data on the share of self-employed and unpaid family workers engaged in nonagricultural employment in Turkey and Brazil; however, Korea only reports data on the shares of nonagricultural, self-employed and unpaid family workers in the overall economy. Thus, the share of nonagricultural, vulnerable employees in Korea is predicted using the share of workers engaged in vulnerable employment throughout the economy[22].

According to Figure 3.20, the nonagricultural, vulnerable employment share in Brazil is higher than in Turkey and Korea. This may be a result of overurbanization in Brazil, as depicted in Figures 3.14 and 3.15. The inegalitarian distribution of land in Brazil drives rural dwellers into cities, which supports the growth of subsistence employment in urban areas. Korea's share of nonagricultural, vulnerable employment is smaller than Brazil's and larger than Turkey's after 1994. The dominance of capital-intensive and informational industries limits the urban capitalist sector's job creation capability in the Korean economy (Yun, 2011). Therefore, a larger share of the Korean nonagricultural labor force is employed in subsistence activities.

Another proxy for urban subsistence activities is the share of employment in service activities. This is not a perfect measure because it also includes service activities involving skilled labor and labor in various services activities such as employees in large grocery stores, chain restaurants, finance, transportation, communication, and tourism activities that could easily be considered part of the urban capitalist sector. Moreover, Kuznets

[22]The share of nonagricultural vulnerable employment is predicted by the following formula: ((overall self-employment share+overall share of unpaid family workers)-(share of agricultural employment*(agricultural self-employment share+the share of agricultural unpaid family workers))/share of nonagricultural employment

The agricultural employment share and shares of overall self-employed and unpaid family workers are from the Korea Statistical Information Service (2013). I use a constant share of 77.9% for the sum of agricultural self-employed and unpaid family workers. This is estimated using data from Heintz (2008) and the Korea Statistical Information Service (2013) for 2005.

(1966) empirically demonstrates that employment in service activities tends to increase as countries grow. The growth in service activities may be accompanied by an increasing share of urban capitalist activities in the service sector. Nevertheless, the employment share in the services sector can provide an approximation of the size of the urban subsistence sector in lower- and middle-income countries.

Figure 3.21 plots the employment shares of service activities at given levels of GDP per capita in Korea, Brazil, and Turkey. As the shares of service activities increase as the economy grows, plotting GDP per capita on the x-axis is more accurate for cross-country comparisons. Figure 3.21 is consistent with Figure 3.14, which plots the relationship between levels of urbanization and GDP per capita. For a given level of per capita income, the employment share of service activities in Brazil is clearly higher than that in Turkey. This suggests that higher levels of agglomeration in Brazilian cities led to increased labor supply in less productive subsistence activities. Moreover, the sizes of the service sectors in Turkey and Korea are similar. The rate at which service sector employment in Turkey's urban areas is lower than in Korea at lower income levels and exceeds Korea's share at higher income levels.

As noted by Davis (2006) and Foster, McChesney and Jonna (2011), another source for the urban reserve army of labor is part-time employment. Figures 3.22 and 3.23 depict the part-time employment rates in Korea, Turkey and Brazil. The part-time employment rate for women and youths might only indirectly affect the household income distribution. Thus, the part-time employment rate for males over 24 years of age is reported separately in Figure 3.23. The figures clearly indicate that Brazil's part-time employment rate is higher than Turkey's or Korea's. Of the three countries, Korea's part-time employment rate was the lowest until the East Asian financial crisis in 1998. Moreover, there has been an increasing trend towards part-time employment in Korea since the East Asian crisis. Interestingly, this trend is not reflected in Korea's overall level of income inequality (Table 3.4). The income Gini coefficient for Korea was 0.310 in 2010, which is slightly below the pre-crisis Gini coefficient of 0.317. Thus, it would be difficult to claim that part-time employment rates explain the income inequality gap between Turkey and Korea. However, the rates are consistent with our argument that Brazil has a larger potential urban reserve army of labor.

In summary, our data indicate that the effect of land inequality on urbanization can explain the difference in inequality between Brazil and Turkey; however, it fails to explain the difference between Turkey and Korea. In the next chapter, I empirically assess the effect of land inequality on income inequality. I also examine whether the differences in the income Gini coefficients operate through the channels proposed in this article.

3.5 Empirical analysis

In this section, I reexamine my interpretations of the above graphs and figures through an econometric analysis. The framework is also designed to test the relevance of causal relationships suggested by previous graphs and tables. Using an OLS analysis, I first examine whether the levels of urbanization and education Gini coefficients in Turkey differ from those in Korea and Brazil when controlling for other possible determinants. The analysis also assesses the impact of land inequality on the cross-country differences among Korea, Brazil and Turkey.

The regressions for urbanization control for the logarithm of per capita GDP following Kuznets (1966), in which economic growth is associated with growth in the urban sector. According to the augmented form of the Harris-Todaro model proposed above, the growth in the capital stock should increase the future growth in the level of urbanization when the entire county's labor stock is held constant. Therefore, I also control for the logarithm of the capital/labor (K/L) ratio in separate regressions[23]. Controlling for the capital/labor ratio is more consistent with the model, as the model includes the capital stock rather than overall output. Trade openness might also affect the level of urbanization, as increasing trade flows change the composition of economic activities, as is widely discussed in the trade literature (e.g., Ohlin, 1935; Dornbusch, Fischer and Samuelson, 1977) In this analysis, the ratio of trade volume (exports + imports) to GDP functions as a proxy for trade

[23]GDP per capita and the capital/labor ratio are included in different regressions, as there is substantial correlation between the two variables. The Pearson correlation coefficient between log(GDP per capita) and log(K/L) is 0.935.

openness[24]. Structural factors other than these variables are controlled for using Korea and Brazil dummies, which might partially capture the effect of land inequality on the cross-country differences in income inequality[25]. Certain regressions also include a land inequality variable. The land Gini coefficients and country dummies are not included in the same regressions because this study is more concerned with the impact of land inequality on the cross-country differences in income inequality than the effects of small changes in land inequality.

Table 3.12 reports the estimates for the levels of urbanization. In the first regression, the coefficient on Brazil dummy is significantly larger than that for Turkey (the omitted dummy), which is consistent with my hypothesis regarding the impact of land inequality. Moreover, and similar to Figure 3.14, the Korean dummy is not significant. However, consistent with the augmented Harris-Todaro model, both the Korea and Brazil dummies become significant when the regression controls for log(K/L). Thus, the explanation for the higher levels of urbanization in Korea is related to Korea's rapid shift towards capital-intensive activities. Moreover, the coefficient for the land Gini coefficient is significantly positive in the last two regressions, indicating that the land Gini coefficient is an important factor affecting the levels of urbanization in Korea, Turkey and Brazil.

Next, the regressions examine whether there is a significant difference between the education Gini coefficients of Korea, Brazil and Turkey when controlling for other factors. We also report the effect of land Gini coefficient on the differences in education inequality. The factors affecting education inequality are included in separate regressions, as compared to Brazil and Korea, the gender gaps in education are a more crucial issue in Turkey (Table

[24]Data for GDP per capita come from the Penn World Tables 7.3 and are included on a PPP($) basis. The level of urbanization and trade volume/GDP data come from the World Development Indicators. I used Marquetti and Foley's (2012) Extended Penn World Tables 4.0 data for the capital/labor ratio.

[25]For reasons of consistency, I controlled for the land inequality using a single type of the land Gini coefficient. As additional data on operational holdings exist for Turkey and Korea, I preferred to base the land Gini coefficient on operational holdings rather than that based on land ownership. The data for the land Gini coefficients come from Ünal (2012) and Frankema (2005) for Turkey, Frankema (2005) for Brazil and Frankema (2005) and Deininger and Squire (1998) for Korea. The land Gini coefficient data are not available for all years. I imputed the land Gini data in the missing years by assuming that a) the land Gini values change linearly between two land Gini data points and b) the land Gini remains constant after the most recent data point.

3.9). The regressions control for GDP per capita, as Figure 3.4 indicates a negative relationship between per capita income and education inequality in the three countries. Increasing trade flows might also influence education inequality by creating incentives for educational investment through increasing the skill premium in both developed and developing countries (Feenstra and Hanson, 1997; Acemoğlu, 2003). Therefore, the regressions also control for trade openness. The last four regressions control for the level of urbanization to account for the effect of land inequality on education inequality through urbanization.

Table 3.13 reports that Korea's education inequality is significantly lower than Turkey's when controlling for other factors. This is consistent with the literature documenting the influence of land inequality on the expansion of education (Engerman and Sokoloff, 2005; Galor and Zeira, 1993; Galor and Tsiddon, 1996; Galor, Moav and Vollrath, 2009; Banerjee and Iyer, 2005; Frankema, 2009; Wegenast, 2009). However, the Brazilian dummy is only significant when we control for the level of urbanization. This indicates that the similarity between Brazil and Turkey's education inequalities might be a result of the effect of land inequality on the level of urbanization. Similarly, the coefficient for land inequality is not significant in model (3), but it is significant in model (4), which controls for urbanization. Moreover, according to all four regressions, the level of urbanization has a significant and negative impact on education inequality.

Table 3.13 also indicates that gender inequality in education is a more severe problem in Turkey than in Brazil. Brazil's coefficients for education inequality among males are significantly larger than its coefficients for overall education inequality[26]. Similarly, the coefficient on land inequality is significant at the 5% level in model (7) but not significant in model (3), which controls for the same variables as (3). Similarly, the coefficient on the land Gini in model (8) is significantly larger than the corresponding coefficient in model (4) at the 1% level.

In summary, Table 3.12 suggests that the capital/labor ratio is an important factor contributing to the similarity of the levels of urbanization in Korea and Turkey, and Table

[26]At the 0.1% significance level, Brazil's coefficient in model (5) is greater than its coefficient in model (1), and its coefficient in model (6) is greater than its coefficient in model (2).

3.13 suggests that the level of urbanization a crucial factor driving the similar education gaps in Turkey and Brazil. These variables might be subject to endogeneity problems, which I attempted to address using 2SLS regressions. First, I instrumented the logarithm of the capital/labor ratio with its 10-year lag. Table 3.14 reports the estimates from the 2SLS-IV regressions. The estimates are highly consistent with those in Table 3.12, suggesting that land inequality has a positive impact on the level of urbanization. Further, the 10-year lag of log(K/L) appears to be a strong instrument according both to the Kleibergen-Paap LM underidentification and Kleibergen-Paap Wald weak identification tests.

Next, I instrumented the level of urbanization using the 10-year lag of the agglomeration rate, i.e., the share of the population residing in cities with populations in excess of 1 million[27], and re-estimated the results regarding the factors that affect the overall education Gini coefficient and the education Gini coefficient for males. The Kleibergen-Paap LM test statistics reject the assumption that the equations are underidentified at the 1% level. Moreover, for all regressions, the Kleibergen-Paap Wald F-values are larger than the critical values of the Stock-Yogo weak ID test, indicating that the 10-year lag of the agglomeration rate is a strong instrument.

The estimates in Table 3.15 are consistent with those reported in Table 3.13. In models (1) and (3), the results for Korea and Brazil are significantly different from those for Turkey when controlling for various factors, including the level of urbanization. Moreover, according to models (2) and (4), land inequality has a positive impact on the overall education Gini coefficient and that for males. Consistent with previous estimates, the level of urbanization also has a negative effect on education inequality.

Next, I analyze the impact of the land Gini coefficients on overall and urban inequality. For consistency, the regressions again employ for the operational version of the land Gini coefficients in all three countries. I also control for several additional variables. Following the Kuznets (1955) hypothesis, the regressions include the logarithms of GDP per capita and its squared term. The impact of trade openness on inequality is also an important subject of debate in both the neoclassical trade (Stolper and Samuelson, 1941; Feenstra

[27]The rate of agglomeration data come from World Development Indicators (2013).

and Hanson, 1997) and political economy literatures (Weller and Hersh, 2004; Onaran, 2009). Therefore, I also control for the impact of trade openness. Table 3.16 reports the impact of the land Gini coefficient on overall and urban income inequality. According to the estimates, the income Gini coefficient is significantly smaller in Korea and larger in Brazil when controlling for other variables, including the level of urbanization. Moreover, the land Gini coefficient has a significant and positive effect on income inequality. The results also support the Kuznets hypothesis for these three countries when controlling for the country dummies.

Finally, I analyze whether the cross-country differences among Brazil, Turkey and Korea are caused by the impact of land inequality moderated by education inequality and the level of urbanization. Turkey faces problems associated with a gender gap in education and reduced nonagricultural labor participation rate for women. However, the income inequality data for Brazil, Turkey and Korea measure the inequality among households rather individuals. Therefore, the gender gaps might not be an important factor that would create the cross-country differences in income inequality among households. Therefore, the impact of overall education inequality and that for males are tested in separate regressions. The regressions that include the effect of education inequality for males also include a variable measuring the gender gap in education. I term this the "gender education ratio", which is the ratio of the average years of schooling for women to total average years of schooling. In addition, I control for trade openness, GDP per capita and its squared term.

As education is likely to affect income inequality over the longer term, the regressions control for the 10-year lags of the education variables. To address endogeneity concerns, the level of urbanization is instrumented with the 20-year lag of the agglomeration rate. Similarly, the 10-year lags of the educational Gini coefficients for the total population and for males are instrumented with their 20-year lags.

Table 3.17 presents the results of the 2SLS-IV regressions. According to the Kleibergen-Paap LM test statistics, the equations explaining the urban income and overall income Gini coefficients are not underidentified. Moreover, the Kleibergen Wald F-values indicate that the instruments included in the regressions for the income Gini coefficient are strong. Nevertheless, the Kleibergen-Wald F-values for models (3) and (4) indicate that the regressions

explaining the urban Gini coefficients are weakly identified. Thus, the estimates regarding urban income inequality should be interpreted with caution.

The estimates in Table 3.17 support our predictions concerning the explanations for the cross-country differences in income Gini coefficients. In all four regressions, the level of urbanization and education Gini coefficients have a significant impact on the income Gini coefficients. The gender education gap does not have a significant influence on the cross-country income differences among Brazil, Turkey and Korea. Considering the coefficients of the land Gini coefficient and the level of urbanization, and the overall and urban income Gini coefficients in 2010, we can conclude that 53.5-67.3% of the total income inequality and 54.9-78.5% of the urban income inequality gap between Brazil and Turkey are explained by the level of urbanization[28]. Moreover, for 2010, 139.7% of the overall income inequality gap between Korea and Turkey is explained by education inequality among males. The inflated impact of education indicates that there are other factors (e.g., skill-biased technological change) that might increase Korea's income inequality to a greater extent than Turkey's.

3.6 Conclusion

This chapter argues that land inequality is plays an important role in determining the levels of income inequality in Korea, Turkey and Brazil. I explain the lower level of income inequality in Korea in terms of the effect of land inequality on education inequality in Korea. The historical data clearly indicate that the spread of education in Korea accelerated following the land reform (Figure 3.1). However, unequal agrarian land distributions became an impediment to the spread of education in Turkey and Brazil. The negative effect of land inequality is particularly noticeable in the Brazilian states and Turkish provinces characterized by more inegalitarian land distributions.

Nevertheless, the effect of land inequality on education inequality cannot explain the differences between Brazil and Turkey, due to the significant gender gap in Turkey and Brazil's institutional preference for higher levels of educational expenditures. The higher

[28]The differences between Brazil's and Turkey's levels of urbanization, overall income and urban income Gini coefficients are 10.2, 0.174 and 0.180, respectively.

education spending in Brazil may be a result of overurbanization, which reduced landlords' ability to hamper educational policies and thereby increased the demand for educational investment from Brazilian society. However, the inegalitarian agrarian structure in Brazil reduced the efficiency of Brazil's educational expenditures. While Brazil spends a significantly higher share of its GDP on public education, Brazil's education inequality is similar to Turkey's.

The difference between the levels of income inequality experienced in Brazil and Turkey is explained by the larger urban reserve army of labor in Brazil. The high level of land inequality in Brazil drives a larger share of the rural population into cities and towns. Nevertheless, urban sector's capacity to produce productive/regular jobs is limited. Therefore, compared to Turkey, a larger share of migrants in Brazil is employed in subsistence, informal and/or part-time jobs and become a part of the urban reserve army of labor. This led to larger urban and overall income Gini coefficients in Brazil.

The conclusions of this paper support the case for progressive land reforms and egalitarian agrarian policies that favor small peasants. Progressive agrarian policies have a broad influence: they reduce inequality and poverty not only in the rural sector but also in the urban sector. Moreover, educational policies can be more effective in the countries with more equal agrarian structures. More equal countries are capable of expanding their education while spending lower shares of their GDP on the public education.

CHAPTER 4

STRUCTURAL CHANGE AND THE KUZNETS HYPOTHESIS

4.1 Introduction

Beginning in the second half of the 20th century, the Kuznets Curve has been considered one of the most groundbreaking ideas in the economic development literature[1]. Many important scholars, including Acemoğlu, Williamson, Barro, Agnion, Bourguignon, Piketty, Fields, Anand, Kanbur, and Robinson, have performed their academic work within the borders of the Kuznetsian framework.

The original version of the Kuznets Curve argument relies mainly on Kuznets (1955)'s AER paper called "Economic Growth and Inequality". In this article, Kuznets (1955) claims that economic growth initially raises income inequality in the lower income countries for two reasons. First, the population weight of the urban sector, which Kuznets assumes to be relatively unequal, increases. Second, the gap between the average urban and rural incomes widens. In the later phases of development, the income inequality declines as a larger share of the urban population becomes "native" urban dwellers, and some of them pursue entrepreneurial opportunities and enroll in the political process. Following the assumption that the service sector is more equal than the industrial sector, Kuznets also claims that the growing employment share of the service sector is also an important factor in reducing inequality.

A large number of studies have examined the relevance of the Kuznets hypothesis by empirical analysis. Some of the empirical works, such as Paukert (1973); Ahluwalia (1976); Jha (1996); Mbaku (1997); Barro (2000); Chang and Ram (2000); and Thornton (2001), have accepted the Kuznets hypothesis. Many other studies (e.g., Deininger and Squire,

[1]In 2011, American Economic Review named Kuznets (1955)'s "Economic Growth and Inequality" as one of the top 20 articles published in AER during its first 100 years.

1998; Cook and Ushida, 2008; Frazer, 2006; Angeles, 2010; Desbordes and Verardi, 2012) have refuted it. Several studies (Tribble, 1999; List and Gallet, 2000) have suggested an S-curve relationship between income per capita and income inequality; that is, the Kuznets hypothesis holds for lower and middle income countries, but economic growth increases income inequality as the level of per capita income rises further.

Most of the empirical work on the Kuznets hypothesis has simply tested the existence of the Kuznets Curve using various methodologies. However, the papers cited above do not examine the mechanisms behind the inverted U relationship between income inequality and income per capita. The main contribution of this paper is to explore empirically the channels that create a Kuznets Curve in developing economies. Following Kuznets (1955, 1963, 1972) and several other influential theoretical works in the literature (Robinson, 1976; Knight and Sabot, 1983; Anand and Kanbur, 1993; Galor and Zeira, 1993), this paper focuses on the influence of structural changes on income inequality. The structural changes might be highly crucial for explaining income inequality in developing countries; for instance, Young (2013) shows that the urban-rural gap on average accounts for 40% of income inequality in developing economies. In this paper, I specifically scrutinize the influence of the urbanization process, urban informal and/or subsistence employment and education inequality on the overall income inequality.

The paper first distinguishes between developed and developing countries and claims that the Kuznets hypothesis is valid only for developing economies because developing economies have very distinct characteristics compared to mature economies. The extent of urbanization, changes in the shares of urban informal sector and expansion/reduction of the education frontier are noticeably greater in developing economies.

Next, the paper discusses the factors explaining the Kuznets Curve. The changing population weights of the urban and rural sectors partially explain the inverted-U relationship between income per capita and income inequality. Nevertheless, the changing population weights argument relies on the assumption of constant urban and rural inequalities, which might be unrealistic in many cases. Moreover, the empirical analyses decomposing the income inequality mostly indicate that the increase in the urban sector's population weight

is not always the main factor behind the changes in overall income inequalities (Eastwood and Lipton, 2004; Kanbur and Zhung, 2013; Oyvat, 2010)[2].

This paper prefers an approach that acknowledges the influence of changes in urban inequality alongside changes in the ratio of average nonagricultural and agricultural incomes. Contrary to the claim by Kuznets (1955), the statistics show that the sectoral ratios between value added and employment shares tend to converge with economic growth (Table 4.3). This convergence may be due to the acceleration of the urbanization process through ongoing industrialization. The reduction in transportation costs and expansion of education in rural areas might stimulate further urbanization and lead to convergence between sectors.

Nonetheless, in the early phases of development, economic growth together with urbanization expand the urban informal employment (Rauch, 1993; Elgin and Oyvat, 2013). Hence, a part of the poverty in the rural sector is transmitted to the urban informal sector, while a limited group of households in the urban formal sector prosper significantly. Moreover, the evidence in the empirical section of this paper shows that economic growth makes access to education more restricted in very low-income countries. Therefore, in the early phase of development, a group of individuals in the more privileged activities benefit more from economic growth, which increases the overall income inequality. In the later phases of development, the gains from economic growth spread to a larger part of population due to several factors. First, the average nonagricultural and agricultural incomes continue to converge in middle-income countries (Table 4.3). Second, the employment share of informal and subsistence activities decreases in the nonagricultural sector (Rauch, 1993; Elgin and Oyvat, 2013). This decrease contributes to the reduction in income inequality, as empirically shown in the next sections. Third, education inequality declines (Table 4.4), which also can reduce income inequality (Acemoğlu and Autor, 2012). Hence, the economic growth in the later phases of development leads to structural changes that reduce the overall inequality.

[2]As explained in the following sections, the changing population weights argument only focuses on the direct impact of the growing urban contribution on the inequality component. The urbanization process can influence income inequality both through internal changes within the urban and rural inequalities and inequality between the urban and rural sectors.

This chapter proceeds as follows. The next section discusses the characteristics specific to developing economies and identifies factors that theoretically might lead to the inverted-U relationship between per capita income and income inequality. The third section presents a cross-country econometric analysis to test the theory, and the last section presents the conclusions.

4.2 Theoretical framework

4.2.1 Defining the Developing Economies

It is often overlooked that Kuznets's (1955, 1963) original hypothesis is only applicable to developing economies. Several empirical studies have presented their results for a sample of countries including both developing and developed countries (Paukert, 1973; Mbaku, 1997; Frazer; 2006; Huang et al., 2007), while others also present results both for samples including only developing and all countries (Ahluwalia, 1976; Anand and Kanbur, 1993; Jha, 1996; Angeles, 2010). Nevertheless, these works still do not emphasize that the Kuznets Curve is not applicable to mature economies. In fact, there is a growing literature pointing to the existence of a S-curve between GDP per capita and income inequality. Income inequality increases at lower levels of per capita income, declines in middle and upper-middle income countries, and increases again at high levels of per capita incomes (List and Gallet, 1999; Tribble, 2000; Galbraith, 2011). Milanovic (1994) calls this the "augmented Kuznets Curve". There might be reasons explaining the second rise of inequality in developed countries, including skilled-biased technical change (Autor, Katz and Kearney, 2008) and an increasing share of financial incomes (Krippner, 2005) in the higher income countries. The increasing inequality in the developed world might also be the outcome of a historical process. The outcomes of neoliberalism might start to dominate the inequality-reducing mechanisms suggested in the inverted-U literature as the country converts into a mature economy.

Whichever factor increases the inequality, the S-curve hypothesis is different from the Kuznets hypothesis, at least the hypothesis in his own work (1955, 1963). The developing economies in the Kuznets hypothesis have four characteristics that distinguish them from

mature economies. These characteristics might lead to an inverted U-shaped relationship between per capita income and inequality:

1) The developing economies experience higher rates of urbanization (Table 4.1).

2) Along with faster urbanization, the employment share of the agricultural sector declines faster in the developing economies (Table 4.2).

3) The differences between labor productivities in the agriculture and non-agriculture sectors are larger, especially in the lower income economies (Table 4.3).

4) The education frontier expands, and the inequality of years of schooling declines as the developing economies grow. The decline in the education Gini coefficient slows down in the higher income economies (Table 4.4).

Tables 4.1-4.4 support the developing-developed divide above. The tables exhibit characteristics for the developed countries and developing economies grouped according to their per capita income levels. For each decade, the countries are classified according to their per capita incomes and levels of development at the midpoint of the decade (1985, 1995, 2005)[3]. For the "developed" and "developing" classification, I used Human Development Index, which relies on Sen (1999)'s capabilities approach measuring development by capabilities-freedom of people to decide on what to do and what to be. The bundle of freedoms called functionings should include access to education, healthcare, food, clean water, the right to speech and movement and various other things that would improve a person's welfare. The functionings might be correlated with economic growth, but they are not always affected by it[4]. Although HDI cannot measure the unlimited aspects of development that can be derived from Sen's approach, compared to income per capita, it can define development from a broader perspective.

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[3]The tables do not include the values for 1965 and 1975 because for 1975, only 5 countries and for 1965, only New Zealand qualified as "developed".

[4]Sen writes about cases where economic growth is not sufficient to improve every aspect of human welfare. In his book "Poverty and Famines", Sen (1981) claims that increasing agricultural prices are the reason for the Bengal famine of 1943, although the higher agricultural prices resulted from the war-induced economic growth in India. Similarly, in "Development as Freedom", Sen (1999) shows that Kerala, a low-income state in India, achieved great success in healthcare and education. He shows that the average life expectancy in Kerala exceeded the average life expectancy of the black population in the US, although the income per capita for the black population in the US was significantly higher.

For this study, the Human Development Index (HDI) values of each country are calculated for each 5 years. UNDP's Human Development Reports classify the countries with HDI scores over 0.800 in the "very high human development" group. Following this categorization, I classify these countries as "developed". One possible problem with the developing-developed divide is that many countries that used to show the characteristics of a developing economy are developed today. An example would be Korea, a developed economy that in 1960, according to the HDI scores, was less developed than today's Uganda, Nepal and Mauritania[5]. Therefore, countries are reclassified as developed according to their HDIs in each period. The estimation of HDI is detailed in Appendix A.

Table 4.1 shows that the rate of urbanization is significantly higher in developing countries than in developed economies during these three decades[6]. Similarly, the average changes in the employment shares of agriculture are higher for the developing economies during the given periods (Table 4.2). Table 4.3 shows the ratio between the sectoral shares of value added to total employment in agriculture, industry and services as a measure of the relative average income in these sectors. Although agriculture's ratio of the shares of value added to the share of total employment is usually higher for the developed economies, we cannot observe a consistent trend for the convergence of agricultural incomes towards mean incomes. Nevertheless, the incomes in both the industry and service sectors converge to the mean incomes as the countries develop. Hence, it is difficult to claim that the industry and service sectors are "privileged" in the developed economies.

Finally, Table 4.4 shows that the decline in the education Gini coefficient for years of schooling is usually less for the developed economies because the years of schooling have an upper limit for the majority of the population. The years of schooling begin to converge at the top as a greater number of people obtain a university degree. Therefore, the education inequalities are very stable for some of the developed economies. The education Gini coefficient in the UK remained approximately 0.24 between 1985-2010. Similarly,

[5]The HDI values calculated for this study are 0.457, 0.446 and 0.435 for 2010's Mauritania, Nepal and Uganda respectively, whereas Korea's HDI score in 1960 is 0.423.

[6]The average changes for the 1960s and 1970s are not reported, as for 1965 only New Zealand was classified as a developed economy, and for 1975, only 5 countries were classified as developed.

Australia's education Gini coefficient declined from 0.13 to 0.12 between 1980-2010, and the education Gini coefficient in the US increased slightly from 0.10 to 0.11 between 2000-2010.

In the next section, we will examine why characteristics specific to developing economies affect inequality. Our first focus is the influence of the sectoral composition. We will first examine the impact of changing shares in the agricultural, nonagricultural, urban formal and urban informal sectors. Then, we will discuss how the education frontier changes with economic growth and whether changing education inequality also affects income inequality.

4.2.2 Changing shares of employment in nonagricultural and agricultural sectors

The first set of arguments on the Kuznets hypothesis centers on the direct impact of changing sectoral composition. In his paper "Economic Growth and Inequality", Kuznets (1955) relies on a two-sector model involving the urban and rural sectors. Like Lewis (1954), Kuznets takes industrialization to be the main feature of economic development. He assumes that enlargement of the urban sector is the natural result of industrialization, and indeed, urbanization is the determinant factor on the formation of the inverted-U curve between per capita income and inequality. In developing his argument, Kuznets makes two important assumptions: "a) the average per capita income of the rural population is usually lower than that of the urban; b) inequality in the percentage shares within the distribution for the rural population is somewhat narrower than in that for the urban population - even based on annual income; and this difference would probably be wider for distributions by secular income levels."

Based on these assumptions, Kuznets claims that the overall inequality within a country increases due to two reasons. First, urbanization followed by migration enlarges the share of the relatively unequal component, the urban sector. The increasing weight of the more unequal sector leads to greater overall inequality. Second, the emergence of industrialization raises the per capita income gap between the urban and rural population, until the benefits of industrialization are also shared by the rural population. Thus, "the relative difference

in per capita income...is stable at best, and tends to widen because per capita productivity in urban pursuits increases more rapidly than in agriculture" (1955:8).

There have been some attempts to model and depict the Kuznets hypothesis by decomposing it to its income components. One of the earlier attempts to model the Kuznets hypothesis is Robinson (1976)'s approach. Using log variance as a measure of inequality, Robinson decomposes the urban and rural sectors into intrasectoral (within-sector) and intersectoral (between-sector) components and examines how the distribution would change over time. In his analysis, Robinson assumes that both the urban-rural gap and the inequalities within the urban and rural sectors are constant. Hence, Robinson's model only examines the impact of the changing employment shares of the sectors, ignoring the changes to the intrasectoral inequalities and to the urban-rural gap. By using this abstract model, he concludes that the inverted U curve hypothesis holds regardless of Kuznets' assumption of a richer and more unequal urban sector. The reasoning here is that the urban-rural gap's contribution to overall inequality is zero when a society is either entirely urban or entirely rural. Hence, the urban-rural gap's contribution to inequality is maximized somewhere in the middle.

Anand and Kanbur (1993) also report a similar analysis for six different measures of inequality[7]. They show that the inverted-U hypothesis holds for all six indices when given conditions are satisfied under the assumption that the urban and rural inequalities and urban-rural income ratio are constant. For their analysis on Theil's T index, Anand and Kanbur decompose Theil's T to its within (T_W) and between (T_B) components:

$$T = T_B + T_W \tag{4.1}$$

Following that, they conclude that a turning point is guaranteed if:

$$\left[\frac{\partial T}{\partial x}\right] = \left[\frac{\partial T_B}{\partial x}\right] + \left[\frac{\partial T_W}{\partial x}\right] < 0 \tag{4.2}$$

at x=1, and

[7]The indices are Theil's T, Theil's L, the squared coefficient of variation, the decomposable transform of the Atkinson Index, the Gini coefficient and the variance of log-income.

$$(T_1 - T_2) < (\theta - 1 - log\theta) \tag{4.3}$$

Here, T_1 and T_2 are the Theil indices for sector 1 and sector 2, respectively; x is the population share in sector 2; and θ is the ratio of the sectoral mean incomes (μ_1/μ_2). If the conditions hold, then the within-sector and between-sector inequalities will have a relationship with population share (x), which is similar to the shape in Figure 4.1. As Figure 4.1 shows, the between urban-rural sector inequality does not contribute to the overall inequality in societies that are either fully urban or fully rural. In addition, if we follow Kuznets's assumption of greater urban inequality, then the within group inequality increases with urbanization.

Nevertheless, there aren't good reasons to assume that the urban-rural income ratio or the within-urban and within-rural inequalities are constant. Indeed, the majority of rural-to-urban migrants do not join the urban sector as a median agent but begin working in inferior informal activities (Banerjee, 1983; Joshi and Joshi, 1976). Hence, rural-to-urban migration itself increases the urban inequality unless there are forces counteracting it. Indeed, there are good reasons to believe that urban inequality is affected by economic development. Several studies have already shown that GDP per capita and/or the level of urbanization affects both the employment and the output shares of the informal sector (Rauch, 1993; Porta and Shleifer, 2008; Elgin and Oyvat, 2013), which is an important factor in urban income inequality. Moreover, Timmer and Akkuş (2008) and McMillan and Rodrik (2012) show that income per capita affects the ratio between the labor productivities in the nonagricultural and agricultural sectors.

There are several studies (Eastwood and Lipton, 2004; Kanbur and Zhuang, 2013; Oyvat, 2010) examining the factors that affect changes in income inequality by decomposing inequality into the contribution of intrasectoral inequality within and intersectoral inequality between the urban and rural sectors. Eastwood and Lipton examine eleven incidences of changes in inequality from 7 countries: China, Indonesia, Thailand, Philippines, Chile, Brazil and Ghana. They report that the changing weight of the urban population is a major factor explaining the change of inequality only in Indonesia between the years 1987-1993.

Indeed, in seven of the eleven cases the decline in intrasectoral inequalities is the major factor affecting overall inequality. In a similar analysis on more recent data for four countries, Kanbur and Zhuang (2013) show that the changing population weight is the major driver of rising inequality in Indonesia and Philippines but fails to explain the changes of inequality in China and India. Additionally, Oyvat (2010) shows that in Turkey, the intrasectoral inequalities contribute significantly more to the changes in overall inequality than the increases in urban population share.

In summary, although the changing weight of employment might partially explain the Kuznets hypothesis, we may require a more complete approach considering the changing sectoral weights of both employment and output along with changes in intrasectoral inequalities.

4.2.3 Enriching vs. enlarging growth

Releasing the assumption of a constant urban-rural income ratio would allow a different understanding of the impact of economic growth on income inequality. Following Fields's (2005) terminology, economic growth could be enabled either by the "enrichment" or the "enlargement" of sectors. The enrichment of sectors would limit the benefits of growth to a portion of society and might not create sufficient employment due to barriers to entry, if the enrichment is in the higher income sector. The enlargement of sectors is the case in which the growing sectors create significant employment and spread the benefits of growth to a larger part of society.

Naturally, we would expect the enrichment of the higher income sector to increase income inequality, whereas the enlargement of the higher income sector might lead to a decline in inequality if sufficient employment is created in the higher income sector. Indeed, Kuznets (1955) himself claimed that the emergence of industrialization raises the per capita income gap between the urban and rural population until the economy reaches a turning point where the benefits of industrialization are also significantly shared by the rural population. However, Kuznets did not prioritize the changing urban inequality as a crucial factor behind

the increase in income inequality during the early phase of industrialization[8]. Later, in "Innovations and Adjustments in Economic Growth", Kuznets (1972) specifically focuses on the impact of unbalanced growth on intrasectoral inequalities and claims that "sectors profiting from...technological innovations, the so called growth-sectors, will tend to yield higher returns to labor and capital than the others...this set of economic inequalities are built into the modern economic growth."

Table 4.3 shows the ratio between the value added and the employment shares of the service, industry and agriculture sectors for each per capita income level to provide an understanding of the relative incomes of these sectors. These data clearly show that in the lower income countries, the industry and services sectors are "privileged", with significantly higher average returns than to the agricultural sectors.

The higher incomes in the nonagricultural sectors might be due to two reasons: 1) the costs of rural-to-urban migration and 2) skill requirements in some of the nonagricultural activities. These factors would create a barrier to entering the higher income sectors and maintain the premium in the higher income sectors at higher levels.

Harris-Todaro (1970) type of models (also Todaro, 1969; Cole and Sanders, 1985; Fields, 1975; 2005) propose that migration between urban and rural sectors is determined by the expected urban and rural incomes[9]. A simplified equilibrium of the Harris-Todaro model would be

$$E(W_U) = E(W_F)\frac{L_F}{L_U} + E(W_S)\frac{L_S}{L_U} = S_R + C \tag{4.4}$$

where $E(W_U)$, $E(W_F)$ and $E(W_S)$ are the expected incomes in the urban, urban formal and urban informal sectors, respectively. L_F and L_S are the volume of urban employment in the formal sector and the volume of urban underemployment in the urban informal sectors; L_U is the urban labor force; S_R is the peasant income; and C is the cost of rural-to-urban

[8]In "Economic Growth and Inequality", Kuznets (1955) only mentions increasing urban inequality where he claims that a group of individuals might benefit from new industries "by an unusually rapid rate of creation of new fortunes", which he expects to be "relatively stronger in the early phases of industrialization".

[9]The empirical work for different countries (e.g. Agesa, 2000; Tunalı, 1996; Bowles, 1970; Fields, 1982; Schultz, 1982) has also found that the average urban and rural incomes significantly affect the migration between the rural and urban sectors.

migration[10]. This model omitted unemployment for the simplicity reasons. Consistent with a number of studies (e.g., Porta and Schleifer, 2008; Temkin, 2009; Yamada, 1996; Portes and Schauffer, 1993; Yuki, 2007; ILO, 1972), the formal sector in this model is a sector with better managerial organization and greater capital intensity and technology[11].

The model predicts that even when the highly productive urban sector cannot produce enough jobs, the rural dwellers move to the urban informal sector while waiting to be employed in the formal urban activities. Thus, the expected urban-rural incomes should converge unless there is a high cost of rural-to-urban sector migration. As in Lewis (1954), the migration costs here include both physical costs such as settling and transportation costs and the psychological costs of moving. As the costs of rural-to-urban migration widen, the gap between the expected urban and rural incomes should increase.

The conventional form of the Harris-Todaro model follows the assumption that the skill levels of the individuals in each sector are similar. Indeed, the skill gaps might be another important factor limiting the migration of rural dwellers. If the skill gaps in a society are high, the rural dwellers with lower skills would have lower opportunities, even in informal urban activities, which would limit the migration of lower skilled workers and create an extra premium for the urban activities. Indeed, a number of studies examining migration behavior show that education is an important factor increasing the probability of rural-to-urban migration (e.g., Agesa, 2000; Tunalı, 1996).

Depending on the costs of migration and skill gaps, the urban sector might either "enrich" or "enlarge", which would affect the overall income inequality differently. Lorenz Curves in Figure 4.2 show how the urban sector's growth might affect income inequality by changing the average incomes in the urban and rural sectors. In Figure 4.1, only two

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[10]Unlike the previous chapter, where the urban sector is divided into urban capitalist and urban traditional, I chose to follow the informal-formal divide in this empirical chapter because subsistence is a more abstract term, and the share of subsistence activities is harder to measure than the share of informal activities.

[11]The characteristics attributed to the formal sector hold on average (Porta and Schleifer, 2008). However, there are informal activities that use technology better than some of the formal activities (Ranis and Stewart, 1999). Also, as Harriss-White (2009) points out, large-scale unregulated activities can exist either by the direct use of political power or with the protection of mafia and/or formal forces such as the police. Nevertheless, for simplicity, we will assume that the migrants prefer to be employed in the formal activities, which offer better incomes.

types of individuals, urban and rural dwellers, are assumed to exist, with urban individuals having greater incomes. In the first path, shown with black lines, the urban sector is enriching without creating sufficient urban employment due to the barriers to entering urban activities. This situation would lead to the expansion the of Lorenz curve. We can observe that inequality increases in this case, although the slope of the line representing urban dwellers is constant, implying that the ratio between per capita urban income over per capita overall income does not change.

If the growth of the urban sector leads to the enlargement of the urban sector, as shown in red lines in Figure 4.2, employment is created in the urban sector, which can spread the benefits of the urban sector to a large portion of society. In this case, inequality is reduced even when the ratio between the rural and overall per capita incomes are constant. The empirical work of Timmer and Akkuş (2008) and McMillan and Rodrik (2012) find a U-shaped relationship between the ratio of agricultural labor productivity to nonagricultural labor productivity and income per capita. That is, economic growth leads to divergence between the labor productivities in the nonagricultural and agricultural sectors in the lower income countries. After a turning point[12], the relative incomes of the agricultural and nonagricultural sectors converge as a result of economic growth.

There might be two reasons for this convergence. First, improvements in the transportation facilities and infrastructure are expected outcomes of economic growth and might lead to a decline in the rural-to-urban migration costs. Following my modified Harris-Todaro equation, the reduction in the migration costs leads to convergence between the expected urban and rural incomes. Second, Table 4.4 shows that the skill differentials decline in developing economies following economic growth. This factor would also relieve the barriers to rural-to-urban migration (Agesa, 2000; Tunalı, 1996) and close the gap between the average incomes in agricultural and nonagricultural activities.

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[12]McMillan and Rodrik (2012) find that the turning point for the U-shaped relationship between the ratio of agricultural labor productivity to nonagricultural labor productivity and income per capita is approximately $9000. Similarly, Timmer and Akkuş (2008) identify a turning point near $5000-9000.

4.2.4 Considering the formal/informal sector

The analysis of Figure 4.1 is incomplete, as the growth in the population share of the urban sector does not necessarily lead to a spillover of benefits into the growing urban sector. Indeed, the growth in the urban sector is also unbalanced. The impact of unbalanced growth in the urban formal sector on inequality can be observed by considering the informal/formal sector divide. The urban informal sector includes activities with lower labor productivity (Shleifer and Porta, 2008) and/or subsistence activities with marginal productivity of labor, similar to zero (Lewis, 1954; Fields 1975), as discussed in the previous chapter. Therefore, it is reasonable to assume that the growth in the urban formal sector is the main driver of the growth in the urban sector. Still, many rural dwellers decide to migrate with the expectation of finding a job in the formal sector and hold an informal job while seeking alternative employment (Banerjee, 1983).

Nevertheless, if the growth in the urban formal sector cannot create sufficient jobs, the move towards the urban informal sector might create a "Todaro Paradox" (Todaro, 1969), where economic growth increases urban underemployment in the urban informal sector[13]. Capitalist development might also pauperize the small peasants and create the following factors that raise the Todaro paradox: 1) improvement in labor-saving technologies reduces the demand for labor on large farms (Harris, 1978; De Janvry, 1981); 2) investments and subsidies favoring large landlords reduce prices for agricultural goods (Boyce, 1993) and lower the revenues of small farmers; 3) the spread of new goods damages the production of non-agricultural rural goods, called "z-goods" (Hymer and Resnick, 1969); and 4) many governments implement pricing policies that support industrialization by changing the terms of trade against the agricultural sector (Kay, 2002; Lipton, 1977).

Nevertheless, there are also factors that might counteract the growing employment share of the informal sector within the urban sector. According to many works in the Marxian literature (e.g., Marx; Baran and Sweezy, 1966; Gordon, Edwards and Reich, 1994; Aglietta,

[13]The growth of the informal sector was observed in all Asian (Moser, 1978), African (Wuyts, 2001) and Latin American (Portes, 1994; de Janvry, 1981; Furtado, 1976) countries in their early phases of development. The informal sector has also recently been growing in China (Hart-Landsberg and Burkett, 2007), which is a lower income country transforming to a medium income one.

2000), capitalist accumulation increases the size of corporations and concentrates capital in fewer hands. We often observe the increasing concentration of capital together with the collapse of the traditional activities[14] that are attached to the informal sector. The argument in these studies is that the concentration of capital is a result of the capitalists' desire to eliminate the other firms and seek monopoly power. Monopoly power increases profits and reduces risks - very appealing for a capitalist. Once a monopolistic or oligopolistic structure is achieved in an industry, the capitalist creates and maintains barriers against new, smaller enterprises. Therefore, we observe an asymmetric structure in capitalist development. Structural changes in an industry that would lead to the destruction of traditional informal activities and to the concentration of capital in fewer hands are likely. However, a structural change that would destroy oligopolies in favor of the traditional sector is less likely. This asymmetric tendency leads to the reduction of traditional informal activities over time.

In addition to the influence of the concentration of capital, as urbanization continues, pressure on the land decreases and agricultural income rises, making the remaining rural dwellers less willing to move to the urban informal sector (Rauch, 1993). It can also be observed from Table 4.1 that the rate of urbanization declines as the country reaches a mature economy. Hence, combined with the growing centralization of capital, the slowdown in the rural-to-urban migration might create a greater tendency for the urban informal sector to shrink in more developed countries. Indeed, for different sets of countries, Rauch (1993) and Elgin and Oyvat (2013) empirically show that the share of informal activities in nonagricultural employment increases during the early phases of urbanization and declines as the countries converge further to an urban society.

The growth of the urban informal sector can influence income inequality both positively and negatively through different mechanisms. The obvious influence of the informal sector on inequality is its impact through changing weights. When the urban inequality is decomposed into formal and informal sectors, the between component has an inverted

[14]In the previous section of this dissertation, I defined traditional/subsistence activities as activities in which the marginal productivity of labor is close to zero.

U relationship with the employment share of the informal sector, where it is minimized for either fully informal or fully formal urban sectors. The between component of urban inequality will be maximized at a point where the informal and formal sectors both exist. Nevertheless, if the share of the informal sector that would maximize urban inequality is very high, we might observe only a positive relationship between the share of the informal sector and urban inequality in some countries.

Nevertheless, the changing weights approach is very incomplete, as it assumes that people who lose their informal jobs or cannot be employed in the informal sector due to the penetration of formal activities will find better paying formal jobs. However, if the concentration of activities in the formal sector cannot create sufficient employment, then the inequality in a country might increase even as the informal sector shrinks[15].

Another factor that might increase inequality is that the vanishing of small informal enterprises might lead to a more oligopolistic structure, which would increase the rates of profits and also income inequality among households. Nevertheless, we should also note that the mechanisms creating monopoly rents are also available in sectors where informal enterprises significantly exist. In urban retailing activities, larger formal enterprises use their monopoly power on small informal retailers/street vendors, and in outsourcing activities, they use their monopsony power on informal subcontractors to exact a surplus from them (Portes, 1994). Hence, formal enterprises' penetration into informal activities might increase the rates of profit, but it is not clear whether this increase will occur by a significant amount.

There are also reasons to believe that informality increases income inequality. First, as explained by the model in chapter 2, subsistence activities constitute an important part of the informal sector and function as a reserve army of labor for the urban capitalist sector. Hence, a large employment share of subsistence activities reduces labor's share of income in the urban capitalist sector by improving the bargaining power of urban capitalist employees.

[15] Also, even when the increase in the employment share of formal activities reduces income inequality, this reduction might not be desirable for some of the individuals whose incomes are relatively improving. The wages in formal activities are mainly better than the informal wages or the incomes of the informally self-employed (Maloney, 2004). Therefore, some of the informally self-employed are waiting to be employed in formal wage jobs. However, some of the informally self-employed prefer their own business to formal wage jobs, as they prefer to work in more flexible conditions.

This issue might lead to an increase in overall inequality among households. Second, higher levels of informality naturally lead to tax evasion and lower tax revenues (Rosser, Rosser and Ahmed; 2000, 2003, 2007). States with limited resources cannot implement the effective redistributive welfare policies that can be implemented through high tax revenues. In addition, progressive income tax policies can only be implemented to a significant degree in countries where incomes are accurately reported. The governments in countries with large unofficial economies tend to collect revenues by consumption taxes that are conceived as regressive (Todaro and Smith, 2009). Hence, the existence of a large informal sector leaves less space for redistributive policies and has a negative impact on inequality.

In summary, the share of informal activities might influence the income inequality through multiple mechanisms. In the empirical section, I will first test whether the inverted-U relationship between income per capita and the employment share of the informal sector exists. Then, I will examine which mechanism listed above has more influence on the overall income inequality. Last, the article will combine both empirical findings and show how the relationship income per capita can influence income inequality through informal activities.

4.2.5 Education and inequality

Education inequality is also a factor that can explain the mechanism behind the Kuznets Curve in developing economies. In "Economic Growth and Inequality", Kuznets (1955) did not thoroughly analyze the impact of education and changing skills and only briefly mentioned education's role in "Quantitative aspects of the economic growth of nations, VIII: The distribution of income by size" (Kuznets, 1963)[16]. Nevertheless, beginning with Knight and Sabot (1983), several studies on education/human capital inequality have attached themselves to the Kuznets hypothesis (Galor and Zeira, 1993; Galor and Tsiddon, 1996). Some of these studies suggest a Kuznets Curve for human capital (Lim and Tang, 2008; Morrisson and Murtin, 2013), meaning an inverted-U relationship between the average years of schooling and the education Gini coefficients.

[16] In "Quantitative aspects of the economic growth of nations, VIII: The distribution of income by size", Kuznets (1963) mentions that the expansion of education is one of the factors that would reduce income inequality. Nevertheless, he also claims that the move from the agricultural to the nonagricultural sector increases income inequality, as the education gaps are greater in the nonagricultural sector.

Knight and Sabot (1983) performed the first analysis on the impact of education on the Kuznets Curve. Knight and Sabot describe the influence of education on income inequality as being determined by two effects: the changing composition of education, which they call the "composition effect", and the changing premium of income, which they call the "compression effect". The combination of these two effects creates an inverted-U relationship between the contribution of education to inequality and the level of development, which is consistent with the Kuznets hypothesis. Nevertheless, Knight and Sabot (1983)'s dataset is very limited, and they do not discuss the factors that affect the education premium or the education inequality.

Various studies (Galor and Zeira, 1993; Galor and Tsiddon, 1996; Galor, Moav and Vollrath, 2009) theoretically examine education inequality and suggest that the changes in education distribution are consistent with the outcomes of the Kuznets hypothesis. In the earlier phases, the poor cannot invest in education due to credit constraints (Galor and Zeira, 1993). Even if they have access credit, education investment would be very costly for the poor, as most of it is financed by borrowing capital rather than intrinsic family incomes (Galor and Tsiddon, 1996). In addition, extra years of education will not be significantly high for very low levels of education. Therefore, educational investment becomes beneficial only for the rich; for people with lower income levels, the returns of education are lower than its costs. As a result, lower income people are trapped in an inferior education equilibrium. Only the rich benefit from technical change, and therefore, inequality increases.

In the later phase of development, a larger portion of the society can and will invest in education, for two reasons. First, as the credit constraint for the poor declines, a larger segment of the population becomes able to finance their education. Second, as labor productivity (and hence wages) increases with improving technology, the lower-income individuals prefer to benefit from these improvements and seek to obtain a similar amount of education to the higher-income classes. As a result, the gap between rich and poor would be reduced.

Galor and Tsiddon (1996) and Galor and Zeira (1993)'s studies on inequality mostly focus on intrasectoral inequalities, and their conclusions are consistent with the Kuznets hypothesis. Nevertheless, they ignore the important question of whether state investment in education could or would change the tendency mentioned in these studies. The obvious

answer is that the institutions can change these tendencies, and inequality could be reduced earlier by implementing public support for the education of the poor. However, the political structure might not allow this process.

The possible policy lines of institutions in the early and late phases of development are examined by Galor, Moav and Vollrath (2009) in a separate article. In their framework, any type of education reform requires a consensus among all segments of society: landlords, urban capitalists and workers. In underdeveloped agrarian societies, the landlords would block the education reforms that would extend the education frontier to a larger portion of society due to the landlords' unwillingness to finance the education of society, as landlords at most benefit indirectly from the formation of human capital. The political restrictions on extending education services increase not only urban but also overall inequality. The negative impact of landowners becomes greater in underdeveloped societies with larger land inequality, where the self-financing opportunities of peasants are more restricted.

The negative impact of land inequality is reduced by capital accumulation followed by industrialization. The landlords trade with the urban sector, so they also benefit from the rising productivity in non-agricultural sectors. As capital stock rises relative to the land, the landowners' gains from the non-agricultural sectors increase further. After a threshold, the landlords' benefit from rising inequality would exceed their costs from financing education; thus, landlords would lose their incentives for blocking education reform.

According to Galor, Moav and Vollrath, both capitalists and workers would benefit immediately from rising urban labor productivity; therefore, they would ally for education reform at any level of development. Thus, education reform would be implemented once the landlords are convinced to extend the education frontier. It also should be added that, contrary to Galor, Moav and Vollrath's assumption of "political consensus", the political impact of capitalists would be greater in the later phases of development, as the influence of landlords might start to become irrelevant with the shrinking share of agricultural output. In summary, there is a tendency for greater development to lead the political authority to be more willing to provide education to their citizens, and thus the education inequality would be reduced. Hence, Galor and Tsiddon's, Galor and Zeira's and Galor, Moav and

Vollrath's work on education claims that education inequality rises in the early phases of development and begins to decline past a certain income threshold.

The changes in education inequality have also been examined empirically by several studies. The outcomes of these empirical analyses depend very much on the methodology implemented for measuring the education inequality. Gregorio and Lee (2002), Thomas, Wang and Fan (2001) and Benaabdelaali, Hanchane, and Kamal (2012) measure the educational gaps using the standard deviation of years of schooling and find an inverted-U relationship between the standard deviation (SD) of schooling and the average years of education. In countries with lower average years of education, the SD of schooling initially rises and the SD of schooling starts to decline following a threshold turning point. Castello and Domenech (2002), Thomas, Wang and Fan (2001) and Benaabdelaali, Hanchane, and Kamal (2012) measure inequality by the Gini coefficient of years of schooling. They find that the years of schooling variable is positively correlated with the Gini coefficient of years of schooling. Finally, Morrisson and Murtin (2013) and Lim and Tang (2008) attribute different rates of return to each year of primary, secondary and tertiary education and calculate "human capital Gini coefficients" that measure the inequality in the education premium. Both Morrisson and Murtin (2013) and Lim and Tang (2008) find an inverted-U relationship between years of schooling and human capital Gini coefficients. The marginal returns for years of schooling in these studies come from Psacharopoulos and Patrinos (2004). However, both studies treat the returns for primary, secondary and tertiary education as constant and do not consider the changes in the education premium.

In Figure 4.3, the average Gini coefficient for years of schooling is presented for different groups of countries: Middle East and North Africa (MENA), Latin America, Europe, South Asia, East Asia, Subsaharan Africa and other developed (USA, Canada, Australia, New Zealand). In Figure 4.3, we can see that education inequality declined in all groups of countries between years 1960-2010. Among the countries with lower education inequalities, e.g., in the European countries, the decline in the education gap is very limited between 1960-2010; in the other developed countries group, the average education inequality ceases to decline after 1980. For the given period, the decline in the education inequality is higher in the Middle East and North Africa and East Asia compared to the other regions. We will

examine the relationship between income per capita and the education Gini coefficients in greater detail in the following sections.

The literature on the relationship between education and income inequalities is inconclusive and presents mixed evidence on the impact of the education frontier on income inequality. In a cross-country analysis, Sylwester (2003) finds that the greater enrollment in higher education in 1970 reduced the income inequality between the years 1970-1990. Using the coefficient of variation and standard deviation of education, Park (1996) and Gregorio and Lee (2002) respectively show that education inequality also reduces income inequality[17].

However, Castello and Domenech (2002) find a very weak correlation (0.27) between the income and education Gini coefficients. In a separate cross-country analysis, Castello-Climent and Domenech (2012) test the influence of changes in the education Gini coefficient and, surprisingly, find that the change in education inequality between years 1960-1980 did not have any significant positive influence on the change in income inequality between the years 1980-2005. Indeed, at the 10% significance level, they find that the decrease in the rate of illiteracy increased income inequality in the higher income OECD countries, and the decline in the education Gini among the literate increased income inequality both in higher income OECD and in less developed countries.

The cross-country studies on the education-income inequality relationship do not completely explain the influence of changing skills possible Kuznets Curves. Indeed, growth in income per capita can also generate technological change, which would increase the demand for skill. According to Goldin and Katz (2008), on one hand, technological progress increases the demand for human capital; on the other hand, education investment reduces the skill premium by satisfying the demand for skilled workers. Goldin and Katz call this phenomenon "the race between education and technology", meaning that the difference between the influence of skilled biased technical change and expansion of the education frontier will determine the ratio of the earnings of the skilled and unskilled.

[17]The problem in Sylwester (2003), Park (1996) and Gregorio and Lee (2002) is that they do not control for the country fixed effects and prefer OLS regressions. Gregorio and Lee (2002) and Sylwester (2003) use regional dummies.

Acemoğlu and Autor (2012) criticize Goldin and Katz's approach and note that improving technology might not necessarily reduce the incomes of the lower skilled. Although technological improvements might be labor-saving in many tasks that do not require highly skill analytical capabilities, some of the manual tasks in the services sector cannot be replaced by machines[18], which would maintain the demand for lower skilled labor at higher levels.

Because a good cross-country proxy for measuring "labor-saving technologies" is not available, this study's scope is limited to the influence of education inequality. Hence, this study does not examine the impact of economic growth on income inequality through changing technology. Nevertheless, as there is a rising supply of relatively skilled labor, the relative incomes of skilled labor are more likely to fall in the countries where the education frontier expands. Hence, I expect "the skilled biased technical change" to be a greater issue in the countries where the expansion of education frontier has stopped (Goldin and Katz, 2008).

4.3 Empirical analysis

This section will empirically examine the validity of the Kuznets hypothesis and the factors that might lead to an inverted U-shaped relationship between income per capita and income inequality. Panel regressions are used to gain a deeper understanding between income per capita and income inequality.

4.3.1 Variable selection

For this paper, I selected the Gini coefficient as a measure of income inequality. I constructed a dataset of Gini coefficients based on different sources, which will be listed in the following section. The Gini coefficient is the most widely used measure of income inequality; therefore, it allows the construction of a larger dataset on the income inequality among households. Nevertheless, the dataset for this study includes Gini data measuring

[18]Acemoğlu and Autor (2012) explain this point by Moravac's Paradox, which can be summarized as "It is comparatively easy to make computers exhibit adult-level performance on intelligence tests or playing checkers, but difficult or impossible to give them the skills of a one-year-old when it comes to perception and mobility".

both income and expenditure inequalities; income Gini coefficient data are not available for every year and every country. For the purpose of having a larger dataset, the expenditure Gini coefficients are used as a proxy for the income Gini coefficients for the years where income Gini coefficient data are not available. However, the estimations in which the Gini coefficient is the dependent variable include a dummy variable controlling whether the dependent variable is income or expenditure inequality. Considering that the marginal propensities of consumption are usually smaller for the lower income groups, the expenditure inequalities are lower for the majority of countries (Deininger and Squire, 1996). Hence, the expenditure dummy is expected to be negative.

In this study, I control for the impact of income per capita by using the logarithm of income per capita and its square as independent variables. These two variables are commonly used in a number of empirical studies on the Kuznets hypothesis (Ahluwalia, 1976; Jha, 1996; Mbaku, 1997; Tribble, 1999; Barro, 2000; Huang et. al., 2006). Several studies applying nonparametric and semiparametric analyses (Frazer, 2006; Desbordes and Verardi, 2012) also control for the logarithms of income per capita. The logarithm of income per capita helps to demonstrate the impact of percentage changes in per capita income rather than its levels.

The regressions in this study also control for several other measures. The impact of trade liberalization on inequality is an important discussion in the trade literature. Although the majority of studies confirm that increasing trade openness decreases wage shares (Harrison, 2002; Breuss, 2010; Guscina, 2006; Onaran, 2009; Jayadev, 2007; Oyvat, 2011), there is no strong perception on the impact of trade openness on the income inequality among individuals. Among the studies on individual income distribution, Milanovic (2005) finds that trade openness increases income inequality in lower income states, and Weller and Hersh (2004) show trade to have a negative impact on the income shares of the poor. However, both Dollar and Kraay (2003, 2004) and Edwards (1997) find that trade openness does not have a negative effect on the individual income distribution. In this study, trade openness is controlled for by (volume of exports + volume of imports)/GDP ratio.

The regressions also control for the impact of economic recessions on the distribution using an economic recession dummy. In a New York Times article, Shiskin (1975) suggested

the definition of a recession as a case in which GDP falls for two consecutive quarters. Many economists have used this as a rule of thumb for defining economic recessions (Claessens and Kose, 2009). Following this rule of thumb, I define years of negative growth as years of recession. Several studies show that (Gezici, 2010; Diwan, 2001; Harrison, 2002; Jayadev, 2007; Onaran, 2009) economic recessions have a negative impact on distribution.

In separate regressions, I include several other variables to explore the factors that might help to explain the inverted-U relationship between per capita income and income inequality. The share of nonagricultural employment in total employment (*Nonagri Emp*) and the nonagricultural sector's share of total value added (*Nonagri VA*) allow us to test whether the "enriching" or "enlarging" growth of the urban sector has an impact on income inequality. Following Figure 4.2, we expect that an increase in the nonagricultural sector's value added should increase income inequality, while the income Gini coefficient should be reduced if the nonagricultural sector creates employment. Another way of measuring the impact of the growth of urban sectors would be to control for the gap between the value added and employment shares of the nonagricultural sectors. The decline of the nonagricultural sector's share in total value added minus its share in total employment (*Nonagri VA - Nonagri Employment*) is expected to reduce income inequality by spreading the benefits of growth in the urban sector.

To test the informal sector's influence on income distribution, I used the nonagricultural employment share of the informal sector derived from the household employment surveys. In addition, I check for the impact of the nonagricultural self-employment share as a proxy for the share of the traditional sector in the urban economy. In countries where the informal sector and self-employment are dominant, the urban population can also meet at the bottom and reduce income inequality[19]. Hence, the empirical analysis also controls the squares of

[19]For the informal sector, I did not choose other alternatives such as Schneider, Buehn and Montenegro (2010) or Elgin and Oztunalı (2012), as both are constructed data, and the employment share of informality is more central to our analysis of the impact of the informal sector on inequality. For nonagricultural self-employment, I did not choose Key Indicators For the Labour Market's (ILO, 2013) data, as it is very limited with respect to developing economies. Also, KILM's data is a mix of self-employment's share in the whole economy and its share only in the nonagricultural sector, which might lead to inconsistencies.

the nonagricultural employment share of the informal sector and the nonagricultural self-employment share.

Another variable that might be crucial for the Kuznets hypothesis is the education Gini coefficient. The education Gini coefficient in this study is measured as the inequality in years of schooling between individuals. The decline in the education Gini coefficient is also expected to reduce the income inequality by reducing the skill gaps (Goldin and Katz, 2008; Acemoğlu and Autor, 2012). Because the influence of education inequality is expected to be realized at a longer time interval, I used 10-year lags for the education Gini coefficients in the regressions.

The analysis also includes regressions examining the factors that influence the share of nonagricultural informal employment, nonagricultural self-employment and the education Gini coefficient. I also tested the impact of per capita income on the gap between the nonagricultural sector's share in total value added and its share in total employment (*Nonagri Gap*). These regressions aim to clarify the mechanisms that lead to the potential Kuznets Curves. *Nonagri Gap* might change due to changes in the (nonagricultural sector's value added share)/(nonagricultural sector's employment share) ratio, which I call the *Nonagri Ratio*. Nevertheless, *Nonagri Gap* can also change due to changing employment weights, even when the *Nonagri Ratio* is constant. Therefore, *Nonagri Ratio* is also estimated in separate regressions to determine whether the reason behind the changes in *Nonagri Gap* are merely changing employment weights or the convergence/divergence between per capita incomes in the nonagricultural or agricultural sectors.

4.3.2 Data sources

This article mainly uses the UNU-WIDER (2008)'s World Income Inequality Database V2.0c to measure the income and expenditure inequality. UNU-WIDER classifies the income/expenditure Gini coefficients from 1 to 4, in which 1 and 4 are the observations with the best and the worst quality, respectively. Following Deininger and Squire (1996), the observations with the quality of 3 and 4 are first excluded. Later, to increase the number of countries in the analysis, data with a quality rate of 3 are also included for the countries with fewer than two observations. The UNU-WIDER dataset continues until the year 2006.

Hence, I expanded the dataset through different sources including the sources Cepal for the Latin American, PovcalNet for the Asian, Eurostat for the European, and OECD for the non-European developed countries.

For the GDP per capita, I used the Penn World Tables 7.1 database. Imports/GDP, exports/GDP, government expenditures/GDP and the value added share of the nonagricultural sector come from the World Development Indicators. The employment share of the nonagricultural sector comes from ILO's Key Indicators of Labor Market (KILM) database. In the KILM database, changes in the methodology led to an increase/decrease in the employment shares approximately 10 times. Hence, I only chose one type of series and excluded the data from different series. For the self-employment and informal employment data, I used Charmes (2009)'s dataset from the labor force surveys. In the case of informal employment, the data spans from 1975 to 2007 in five-year intervals. However, in the case of self-employment, the time span is from the 1970s to the 2000s in ten-year intervals. For the period after 2007, I used the dataset of ILO/WIEGO (2012) for the informal employment. This dataset is also formed by country-wise labor force surveys. Charmes's and ILO/WIEGO (2012)'s informal employment estimations are consistent with each other. Both define informal employment as non-coverage by social protection.

The education Gini coefficients are taken from Benaabdelaali, Hanchane, and Kamal (2012)'s dataset on education inequality. Benaabdelaali, Hanchane, and Kamal calculate the education Gini coefficient of years of schooling using Barro and Lee (2012)'s cross-country dataset of educational attainment.

4.3.3 Empirical results

I first tested the validity of the Kuznets hypothesis. The relationship between income inequality and income per capita might be subject to problems of endogeneity and reverse causality. Therefore, I instrumented the logarithms of GDP per capita and its square with their 10-year lags using 2SLS methodology. Table 4.5 presents results for the datasets including only developing and all countries. For the first two regressions, with 10-year lags of GDP per capita, its square and cube are strong instruments according to the Kleibergen

Paap rk Wald F values[20]. The estimates support the S-curve hypothesis (List and Gallet, 1999; Tribble, 2000; Galbraith, 2011) with turning points at approximately $1950 and $23000-26000. This result also supports this paper's claim that the Kuznets hypothesis only holds for developing economies, as only two countries, Kuwait and Trinidad and Tobago, are classified as developing and had income per capita above $23199.

Next, the logarithms of the GDP per capita and its square are instrumented with 10-year lags using 2SLS methodology. Consistent with this paper's claim, the inverted-U relationship between income per capita and income inequality holds only for the sample with only developing countries (Table 4.5). The turning point for the inverted-U is at approximately $2500-2700, which is slightly higher than the turning point estimated for all countries. Kleibergen Paap rk Wald F values again show that the 10-year lags of GDP per capita and its square are strong instruments[21]. Among the control variables in Table 4.5, Government Expenditures/GDP has a significant negative impact on income inequality in all of the regressions. Hence, according to the estimates, government expenditures have a redistributive character. Trade openness has a positive but insignificant sign in all of the regressions. Economic recessions significantly increase the income Gini coefficient only in the developing countries. Finally, the expenditure Gini coefficient dummy has a significant negative sign, which shows that estimating the Gini coefficient through expenditure inequality gives lower values than the income Gini coefficients.

Next, I estimate the factors leading to the possible inverted-U relationship between GDP per capita and income inequality using country fixed effects. Table 4.6 presents the results for the sample including only developing countries. The first two regressions show that education inequality has a positive impact; however, its coefficient is significant only at the 10% level. Next, I controlled for the impact of the nonagricultural sector's value added and

[20]Moreover, all of Kleibergen-Paap rk LM tests in this chapter reject the null hypothesis at 0.1% significance level. This shows that the instruments used in this chapter are not underidentified.

[21]In the first-stage estimations, the square of GDP per capita has a negative sign. This point might seem counterintuitive at the first sight; however, the 10-year lags of GDP per capita and its square do not have a negative impact when the influence of the two variables are combined. In the first stages of regressions (3) and (4) in Table 5, the smallest turning point for GDP per capita is at approximately 30 million $. For the first stages of (5) and (6), the smallest turning point is $34571. However, Kuwait is the only "developing" country whose income per capita exceeded $34571.

employment shares. As expected, the signs for *Nonagri Emp*, *Nonagri VA* and *Nonagri Gap* are positive, negative and positive at the 5% significance level, respectively. These results are consistent with the predictions of the previous section that growth in nonagricultural value added increases income inequality if it cannot create sufficient employment. Hence, in contrast to the predictions of Kuznets (1955) and Robinson (1976), rising nonagricultural employment reduces income inequality.

The last two regressions in Table 4.6 also control for the logarithm of GDP per capita and its square. I controlled these variables to examine whether the effect of the changing sectoral shares and education inequality on income distribution is an outcome of changing the GDP per capita. The estimates show that the coefficients for the education Gini, *Nonagri Emp*, *Nonagri VA* and *Nonagri Gap* variables lose their significance and mostly significantly decrease when income per capita and its square are controlled[22]. Moreover, the signs for GDP per capita and its square significantly support the Kuznets hypothesis, which shows that income per capita is an important driving force behind the influence of sectoral shares and education inequality on income inequality.

The relationship between value added and the employment shares of the nonagricultural sector, education inequality and income inequality might suffer from endogeneity problems. Therefore, I also instrumented the *Nonagri Gap* with its 3-year lag and education inequality's 10-year lag with its 20-year lag using 2SLS methodology. The dataset for *Nonagri Gap* is very discrete, which does not allow us to instrument *Nonagri Gap* with its further previous lags.

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[22] According to the t-tests, the coefficients in regression (5) for education Gini, *Nonagri Emp* and *Nonagri VA* are significantly smaller at the 1, 5 and 15% significance levels, respectively, than the coefficients in (3). Similarly, when the coefficients in (4) and (6) are compared, the coefficients in (6) for *Nonagri Gap* and education Gini are significantly smaller at the 5 and 20% significance levels, respectively.

significantly decrease when income per capita and its square are controlled[23]. Moreover, the signs for GDP per capita and its square significantly support the Kuznets hypothesis, which shows that income per capita is an important driving force behind the influence of sectoral shares and education inequality on income inequality.

The relationship between value added and the employment shares of the nonagricultural sector, education inequality and income inequality might suffer from endogeneity problems. Therefore, I also instrumented the *Nonagri Gap* with its 3-year lag and education inequality's 10-year lag with its 20-year lag using 2SLS methodology. The dataset for *Nonagri Gap* is very discrete, which does not allow us to instrument *Nonagri Gap* with its further previous lags.

Table 4.7 presents results for the dataset including only developing countries. For all four regressions, the Kleibergen Paap rk Wald F values show that the lags of variables are strong instruments. The first two regressions show that education inequality significantly reduces income inequality. The sign for the education Gini coefficient loses its significance when *Nonagri Gap* is also controlled. Nevertheless, these results should be interpreted cautiously because the decline in the number of groups might also have reduced the significance of the education inequality's coefficients. Last, similar to Table 4.6, the education Gini coefficient and *Nonagri Gap* lose their significance when the GDP per capita and its square are controlled. Moreover, the estimates support the inverted-U relationship between income per capita and income inequality, which again shows that the income per capita affects income inequality through the channels of sectoral shares and education inequality.

The regressions on the nonagricultural sector's value added and employment shares do not capture the influence of structural changes within the nonagricultural sector. Hence, the impact of changes in the nonagricultural informal employment and self-employment are also tested in separate regressions. Charmes (2009) dataset reports observations for periods rather than exact years. Therefore, for Charmes's data, I selected the median

[23] According to the t-tests, the coefficients in regression (5) for education Gini, *Nonagri Emp* and *Nonagri VA* are significantly smaller at the 1, 5 and 15% significance levels, respectively, than the coefficients in (3). Similarly, when the coefficients in (4) and (6) are compared, the coefficients in (6) for Nonagri Gap and education Gini are significantly smaller at the 5 and 20% significance levels, respectively.

years of the periods as observations[24]. When countries do not have observations of the Gini coefficient in the median years, I selected the years with Gini coefficients within the given period and took the nearest to the median of periods. The existence of nonlinear relationships between informal/self-employment and income inequality is also tested, based on the concerns discussed in the theoretical section.

Table 4.8 demonstrates that nonagricultural informal employment affects the income Gini coefficient positively in a linear relationship rather than an inverted-U relationship. Along with the changing weights of the informal and formal sectors, the higher rates of tax collection in countries with a larger formal sector might have reduced the inequality, as in Rosser, Rosser and Ahmed (2000, 2003, 2007). Moreover, similar to the arguments discussed in the previous chapters, a larger share of informal employment might have reduced the labor shares in the formal nonagricultural formal sector and contributed negatively to the overall income inequality.

The rising gap between the nonagricultural sector's value added and employment shares has a significant positive effect on income inequality, as in Table 4.6 and Table 4.7. Moreover, the *Nonagri Gap*'s coefficient loses its significance when the GDP per capita and its square are controlled. The education Gini coefficient is only significant at 10% in one of the regressions. Nevertheless, these results should be interpreted cautiously, as we are left with only 27 country groups when the education Gini coefficient, *Nonagri Gap*, and nonagricultural informal employment shares are controlled for in the same regressions[25]. Finally, the coefficients for informal employment do not change when the GDP per capita and its square are controlled. Hence, we cannot interpret the GDP per capita's impact on income inequality through informal employment merely by using Table 4.8.

Table 4.9 shows the influence of nonagricultural self-employment on income inequality. In the regressions for self-employment, I use a sample including both developed and

[24]I selected the years 1975, 1982, 1987, 1992 and 2004 for informal employment and 1975, 1985, 1995 and 2005 for self-employment.

[25]Indeed, the values of the education Gini coefficient are insignificant even at the 10% level when we run regressions (4)-(7) using the same observations without controlling for nonagricultural informal employment.

developing countries due to lack of data for the developing economies[26]. Nonagricultural self-employment's positive impact on income inequality is significant at 5%, when *Nonagri Gap* is controlled. However, we cannot observe an inverted-U relationship between self-employment and income inequality. Similar to the previous estimations, *Nonagri Gap* has a significant positive impact. Nevertheless, the influence of education inequality is significant only at the 10% significance level. Similar to Table 4.9, nonagricultural self-employment's coefficient is not significantly different when the GDP per capita and its square and cube are controlled[27,28]. Hence, Table 4.9 also cannot suggest anything on regarding the impact of GDP per capita on income inequality through self-employment. The impact of income per capita on informal employment and self-employment is examined further in this section.

Next, I tested whether the factors that affect income inequality are influenced by income per capita. First, income inequality's effect on *Nonagri Gap* and its influence on the ratio between the nonagricultural sector's value added and employment shares (*Nonagri Ratio*) are tested. Due to possible endogeneity problems, I instrumented GDP per capita with its 10-year lag when the linear effect of income per capita was being tested. Moreover, the existence of a nonlinear relationship between variables was also considered in the regressions. Hence, I instrumented GDP per capita and its square with their 10-year lags to test whether there is an inverted-U relationship between income per capita and *Nonagri Emp* or between income per capita and *Nonagri Ratio*.

According to the estimates in Table 4.10, there is an inverted-U relationship between income per capita and *Nonagri Gap*. That is, economic growth increases *Nonagri Gap* in the lower income countries and reduces *Nonagri Gap* in the countries with GDP per capita over \$732-840. This result is consistent with the estimates of Timmer and Akkuş (2008); however,

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[26]The number of country groups drops to 23 when nonagricultural self-employment, *Nonagri Gap*, and the education Gini coefficient are controlled in the same regression.

[27]I also control for the cube of GDP per capita, as we use the data for both developed and developing economies.

[28]According to the t-test, there is no significant difference between self-employment's coefficients in regressions (5) and (7).

the turning points that I estimated are smaller[29] than the ones in either study. However, the estimates show that rising GDP per capita reduces the nonagricultural sector *Nonagri Ratio* linearly, which is different from Timmer and Akkuş (2008) and from McMillan and Rodrik (2012). This result suggests that the per capita incomes in the nonagricultural and agricultural sectors converge to each other with economic growth. Nevertheless, rising income per capita in the lower income countries increases *Nonagri Gap* due to the changing employment weights of the nonagricultural and agricultural sectors.

Next, I tested the impact of income per capita on the education inequality as in Knight and Sabot (1983). For this purpose, I again instrumented GDP per capita and its square with their 10-year lags using 2SLS methodology. The estimates are reported in Table 4.11. The results suggest an inverted-U relationship between GDP per capita and education inequality for developing countries. Hence, economic growth increases education inequality only in very low-income countries; however, it expands the education frontier in the developing economies with GDP per capita above $445-576.

Last, I estimate the effect of GDP per capita on nonagricultural informal employment and self-employment[30]. Similar to the previous estimations, for Charmes's data, I used the median years of the periods as observations. Controlling for other variables, the results suggest an inverted-U relationship between the informal employment share and per capita income and between the self-employment share and per capita income (Table 4.12). These results are consistent with the estimations of Rauch (1993) and Elgin and Oyvat (2013) that use a relatively smaller dataset of informal/self-employment shares. Nevertheless, the evidence is weaker for the nonagricultural self-employment rate, as the coefficients for GDP per capita and its square are only significant at 10% significance level.

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[29]Timmer and Akkuş (2008) find that the turning point for the gap between the value added and the employment shares of the agricultural sector is at approximately $5063-9255.

[30]Due to data limitations, 2SLS methodology is not implemented in the regressions for nonagricultural informal employment and nonagricultural self-employment.

4.3.4 Summary of results

Table 4.13 summarizes the results of the panel regressions. The overall results are consistent with the Kuznets hypothesis. In the very low-income countries, the gap between the value added and employment shares of the agricultural and nonagricultural sectors increases with economic growth. Moreover, economic growth expands informal employment/self-employment within the nonagricultural sector and also increases education inequality. These two processes also increase the income inequality in lower income countries. In countries with per capita income between \$445/576-\$1897/2388, economic growth reduces education inequality; however, income inequality still rises, due partially to the influence of growing informal employment and self-employment. Hence, urbanization following economic growth is not itself sufficient to reduce the income inequality in lower income countries. In these countries, the poverty in the rural sector is merely transmitted to the urban informal sector, whereas a limited group of households get richer.

In countries with per capita incomes between \$1948/2695 - \$5131/5283, growing per capita incomes continue to reduce the gap between nonagricultural and agricultural incomes and education inequality. The influence of economic growth through these channels transcends the impact of growing informal employment on income inequality. Hence, the income inequality begins to decline at approximately \$1948/2695.

Lastly, for per capita incomes between \$8982/10277 - \$23199/26152, all types of structural changes listed promote a more egalitarian income distribution. In this phase of growth, the barriers between different income groups are relieved, which spreads the benefits of economic growth to a larger segment of society and reduces income inequality.

4.4 Conclusion

This chapter empirically tests the Kuznets hypothesis and examines the factors that might lead to the Kuznets Curve. The analysis first shows that the Kuznets hypothesis is valid only for developing economies in which we observe a noticeable trend of urbanization, expansion of the education frontier and a large share of informal employment. The reasoning behind the existence of the Kuznets Curve is slightly different from Kuznets's (1955) own

reasoning. The analysis finds that unlike Kuznets's own argument, the income per capita in the nonagricultural and agricultural sectors tend to converge following economic growth even in the lower income developing economies. Nevertheless, increasing the income per capita still increases income inequality through the urbanization channel due to the changing population weights effect, as in Robinson (1976) and Anand and Kanbur (1993).

Another important reason behind rising income inequality in the developing countries is the increasing intrasectoral inequality. During the earlier phases of industrialization, the shares of informal and subsistence employment in the nonagricultural sector grow, which also increases overall income inequality. Therefore, urbanization followed by economic growth does not immediately reduce income inequality. The trend of urbanization possibly feeds the growth of informal and subsistence employment in the urban sector, which leads to higher income inequality until the income per capita reaches approximately $1950.

In the latter phases of industrialization, economic growth reduces income inequality as the labor markets become more homogeneous, the impact of the gap between the nonagricultural and agricultural sectors on overall inequality declines, and the informal-formal and subsistence-modern sector divides shrink. The analysis also finds weak evidence for the effect of income per capita on income inequality through the education channel. I find that economic growth raises education inequality in very low-income countries and expands the education frontier following a turning point. Nevertheless, the evidence for the impact of education inequality is weaker than of the other mechanisms identified above, and not significant in all of the regressions.

The Kuznets hypothesis is useful for understanding the general tendencies of the changes in income distribution in developing economies, which might be crucial for correctly interpreting the effects of policies on distribution. Economic growth might lead to structural changes that would reduce income inequality in the middle and upper-middle income countries. Nevertheless, policymakers cannot entirely rely on economic growth, as other factors such as the size of redistributive government expenditures also determine income inequality. Moreover, the equalizing effects of economic growth on income Gini distribution tend to disappear as the developing economies converge to a mature economy.

CHAPTER 5

CONCLUSION AND POLICY IMPLICATIONS

This dissertation points to two main conclusions. First, in the second and third chapters we observed that land inequality and rural poverty are important for the distribution in the urban sector. Using different types of methodologies - a theoretical model, and an empirical and a comparative analysis- this dissertation shows that land inequality has an influence on urban income inequality through its influence on the level of urbanization. It follows that policymakers should have a broader view as to the importance of agrarian policies. They should realize that a progressive land reform or any policy favoring small landholders can also reduce urban income inequality and poverty over the long run. A similar argument can also be made with respect to labor unions and left-wing opposition parties. These institutions also should be concerned about agrarian policies, since higher land inequality leads to overurbanization and creates a larger urban reserve army that would suppress the bargaining power of the urban working classes.

The second conclusion drawn from this dissertation is that the Kuznets hypothesis is valid; there is an inverted-U relationship between income per capita and income inequality with a turning point around $2000-2700. However, the Kuznets hypothesis only holds in developing economies. Indeed, there are not good reasons to assume that income inequality will continue to fall in the mature economies once the urban-rural divide starts to disappear and the share of informal activities is low. This is because income per capita affects income inequality mainly through the shifts in the sectoral employment shares. Economic development affects the urban-rural gaps and the share of informal activities that are determinant on the overall income inequality.

The Kuznets hypothesis can be important for correctly interpreting the influence of different policies on income inequality. A middle income country achieving actual growth close to its potential growth rate might be missing an important opportunity if its income

inequality is not falling in time. Moreover, the positive effects of rising GDP per capita will not persist forever; they will disappear as the country starts to converge to a mature economy.

The evidence for the impact of education inequality on overall income inequality is relatively weak compared to other factors discussed in this dissertation. The empirical evidence in the third chapter suggests that land inequality is an important factor that affects the education gaps in Turkey, Korea and Brazil. The third chapter also shows that the unusually equitable access to education kept income inequality in Korea at a lower level. However, Korea is a case in which the education frontier expanded at exceptional speed following the land reform. The level of education inequality in Korea was lower than the education inequality in Turkey and Brazil even during 1960s and 1970s, when Korea's income per capita was lower. On the other hand, the empirical analysis in the second chapter cannot prove that the education inequality is determinant on the cross-country differences of income inequality. The relationship between education and income inequalities is mostly positive for the majority of estimates; however, the sign for education inequality is significant at 10% in only one of the regressions.

Similarly, the empirical analysis in the fourth chapter suggests that the impact of education inequality is relatively weaker than the impacts of sectoral shares and informal employment. The effect of education inequality on income inequality is significant at the 5% level only in some of the regressions; in others it only is significant at the 10% level or not at all. This is consistent with Young's (2013) estimates that education inequality constitutes only 19% of overall inequality in developing economies on average. According to Young, urban-rural gaps and other factors that influence income inequality within urban and rural sectors are more important factors than education inequality. Hence, the education channel might be valid for explaining both land inequality's and income per capita's impact on income inequality. However, factors that influence wage-bargaining and changes in the sectoral shares and informal employment are more important mechanisms for determining the income inequality in the developing economies.

The results in this dissertation can be improved through different approaches and new datasets. Empirical studies using a micro dataset of households might also support this

dissertation by investigating how land inequality in a region influences the migration behavior or individuals' chances of reaching education. Moreover, wider datasets on income Gini coefficients, employment and value added shares of urban and rural sectors; informal employment share, or an education inequality dataset with a urban-rural divide could significantly improve the robustness of the results in the fourth chapter. Hence, there is still space for further examination on the structural factors determining income inequality in developing economies.

Table 2.1. Dataset summary statistics

	Mean	**Std. Dev.**	**Min**	**Max**
Land Gini Coefficient	0.61	0.16	0.27	0.92
Overall Income/Expenditure Gini Coefficient	0.41	0.10	0.24	0.70
Urban Income/Expenditure Gini Coefficient	0.46	0.08	0.30	0.67
Level of Urbanization	0.59	0.23	0.13	0.99
GDP per capita (1000 USD)	12.69	13.57	0.23	49.97
Trade Openness	0.78	0.36	0.23	1.83
Women's Nonagri Labor Participation Rate	0.39	0.12	0.10	0.52
Education Gini Coefficient	0.36	0.17	0.11	0.83
Polity IV Index	4.26	6.13	-10.00	10.00
Voice and Accountability Index	-0.03	0.96	-1.74	1.61
Land Area (000's)	956.4	1924.3	0.7	9327.5

Table 2.2. The impact of land inequality from 1960's on the recent urban income inequality - (dependent var: Urban income Gini coefficient)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Land Gini (1960)	0.130***	0.167**	0.199**	0.201*	0.215*	0.202*	0.165**	0.153**
	(0.068)	(0.067)	(0.074)	(0.057)	(0.058)	(0.068)	(0.069)	(0.066)
Expenditure	-0.048**	-0.065*	-0.021	-0.052*	-0.057**	-0.036	-0.061*	-0.056**
	(0.021)	(0.022)	(0.022)	(0.018)	(0.020)	(0.029)	(0.021)	(0.021)
Log_GDP		-0.011	0.061***		-0.008	0.094**	-0.017	-0.009
		(0.015)	(0.034)		(0.017)	(0.042)	(0.014)	(0.013)
$(Log\_GDP)^2$		-0.003	-0.028***		-0.002	-0.035**	-0.004	-0.006
		(0.007)	(0.014)		(0.007)	(0.017)	(0.007)	(0.007)
Openness			-0.033			-0.026		
			(0.020)			(0.020)		
Women			0.330*			0.308**		
			(0.101)			(0.146)		
Southern Africa	0.144*	0.139*	0.120**	0.161*	0.155*	0.125**	0.126*	0.130*
	(0.029)	(0.027)	(0.053)	(0.025)	(0.027)	(0.051)	(0.029)	(0.028)
Education Gini (2000)				0.083	0.042	0.090		
				(0.060)	(0.073)	(0.119)		
Voice and Acc. (2000)							0.024	
							(0.016)	
Polity IV (2000)								0.004**
								(0.001)
Constant	0.387*	0.392*	0.222*	0.302*	0.328*	0.161***	0.411*	0.388*
	(0.052)	(0.051)	(0.053)	(0.058)	(0.067)	(0.092)	(0.055)	(0.048)
Adj. R-squared	0.39	0.40	0.49	0.45	0.44	0.50	0.41	0.43
Observations	56	56	35	54	54	34	56	56

Notes: Robust standard errors are reported in parentheses. *, **, *** denote 1%, 5% and 10% confidence levels, respectively.

Table 2.3. The impact of land inequality from 1960's on the recent overall income inequality (OLS regressions - dependent var: Overall income Gini coefficient)

	(1)	(2)	(3)	(4)	(5)	(6)
Land Gini (1960)	0.195*	0.151*	0.170*	0.206*	0.130**	0.142*
	(0.018)	(0.051)	(0.054)	(0.070)	(0.058)	(0.051)
Expenditure	0.010	-0.072*	-0.085*	-0.017	-0.086*	-0.094*
	(0.064)	(0.022)	(0.019)	(0.025)	(0.025)	(0.019)
Log_GDP		0.029	0.109*		0.017	0.082*
		(0.019)	(0.025)		(0.020)	(0.024)
$(Log\_GDP)^2$		-0.021*	-0.041*		-0.020*	-0.037*
		(0.005)	(0.006)		(0.005)	(0.006)
Openness			0.012			-0.010
			(0.022)			(0.015)
Women			0.136***			0.157***
			(0.073)			(0.092)
Southern Africa		0.126*	0.180*		0.119*	0.171*
		(0.030)	(0.029)		(0.032)	(0.030)
Education Gini (2000)				0.134***	-0.032	-0.048
				(0.069)	(0.072)	(0.104)
Constant	0.284*	0.393*	0.259*	0.236*	0.442*	0.342*
	(0.044)	(0.045)	(0.050)	(0.051)	(0.073)	(0.087)
Adj. R-squared	0.08	0.52	0.76	0.10	0.57	0.80
Observations	99	99	64	92	92	62

Notes: Robust standard errors are reported in parentheses. *, **, *** denote 1%, 5% and 10% confidence levels, respectively.

Table 2.4. The impact of land inequality from 1960's on the recent overall income inequality when institutions are controlled - (OLS regressions - dependent var: Overall income Gini coefficient)

	(1)	(2)	(3)	(4)	(5)	(6)
Land Gini (1960)	0.173*	0.150*	0.170*	0.195*	0.145*	0.157*
	(0.060)	(0.051)	(0.055)	(0.064)	(0.052)	(0.051)
Expenditure	-0.037***	-0.073*	-0.088*	0.009	-0.064**	-0.080*
	(0.021)	(0.022)	(0.020)	(0.019)	(0.023)	(0.019)
Log_GDP		0.029	0.108*		0.031***	0.099*
		(0.018)	(0.024)		(0.019)	(0.025)
$(Log\_GDP)^2$		-0.020*	-0.041*		-0.022*	-0.040*
		(0.005)	(0.007)		(0.005)	(0.006)
Openness			0.012			0.001
			(0.022)			(0.016)
Women			0.110			0.050
			(0.111)			(0.097)
Southern Africa		0.127*	0.178*		0.125*	0.179*
		(0.030)	(0.030)		(0.030)	(0.028)
Voice and Acc. (2000)	-0.040*	-0.002	0.006			
	(0.011)	(0.011)	(0.016)			
Polity IV (2000)				-0.001	0.001	0.003
				(0.002)	(0.001)	(0.002)
Constant	0.318*	0.392*	0.275*	0.288*	0.387*	0.303*
	(0.042)	(0.046)	(0.064)	(0.045)	(0.046)	(0.052)
Adj. R-squared	0.18	0.51	0.76	0.07	0.53	0.79
Observations	99	99	64	97	97	63

Notes: Robust standard errors are reported in parentheses. *, **, *** denote 1%, 5% and 10% confidence levels, respectively.

Table 2.5. The impact of land inequality from 1960's on the recent level of urbanization - (OLS regressions - dependent var: Level of urbanization in 2010)

	(1)	(2)	(3)	(4)
Land Gini (1960)	0.446*	0.224**	0.245**	0.246**
	(0.142)	(0.095)	(0.101)	(0.099)
Log_GDP		0.120*	0.131*	0.131*
		(0.012)	(0.011)	(0.011)
Openness			0.002	0.018
			(0.047)	(0.054)
Log_Area				0.008
				(0.011)
Constant	0.323*	0.243*	0.207*	0.097
	(0.089)	(0.056)	(0.074)	(0.167)
Adj. R-squared	0.08	0.56	0.62	0.62
Observations	99	99	87	87

Notes: Robust standard errors are reported in parentheses. *, **, *** denote 1%, 5% and 10% confidence levels, respectively.

Table 2.6. The impact of urbanization on the recent overall income inequality - (IV (2SLS) regressions - dependent var: Overall income Gini coefficient)

	(1)	(2)	(3)	(4)	(5)
Log(Urbanization)	0.051***	0.074**	0.054**	0.075**	0.073**
	(0.030)	(0.030)	(0.026)	(0.029)	(0.030)
Expenditure	-0.099*	-0.098*	-0.121*	-0.098*	-0.088*
	(0.023)	(0.019)	(0.018)	(0.020)	(0.021)
Log_GDP	0.030	0.025	0.005	0.024	0.026
	(0.029)	(0.030)	(0.025)	(0.030)	(0.030)
$(Log\_GDP)^2$	-0.028*	-0.027*	-0.026*	-0.027*	-0.028*
	(0.006)	(0.006)	(0.005)	(0.007)	(0.006)
Openness	0.021	0.008	-0.006	0.008	-0.001
	(0.021)	(0.019)	(0.015)	(0.019)	(0.016)
Southern Africa		0.135*	0.117*	0.134*	0.135*
		(0.024)	(0.027)	(0.024)	(0.025)
Education Gini (2000)			-0.102		
			(0.072)		
Voice and Acc. (2000)				0.002	
				(0.010)	
Polity IV (2000)					0.002
					(0.001)
Constant	0.321*	0.229**	0.400*	0.229**	0.230**
	(0.111)	(0.108)	(0.100)	(0.109)	(0.110)
First stage for log(urbanization)					
Log(Urbanization) - 1990	0.829*	0.827*	0.808*	0.828*	0.826*
	(0.066)	(0.071)	(0.074)	(0.072)	(0.072)
Kleibergen-Paap rk Wald F values	157.35	135.67	112.34	132.88	133.10
Observations	87	87	82	87	85
Ordinary least squares					
Log(Urbanization)	0.054***	0.075**	0.052***	0.075**	0.070**
	(0.030)	(0.033)	(0.028)	(0.033)	(0.032)

Notes: Robust standard errors are reported in parentheses. *, **, *** denote 1%, 5% and 10% confidence levels, respectively.Stock-Yogo weak ID critical test values are 16.38 for a 10% maximal IV size, 8.96 for a 15% maximal IV size, 6.66 for a 20% maximal IV size, and 5.53 for 25% maximal IV size.

Table 3.1. The Gini coefficient values for Brazil

	urban	rural	total		urban	rural	total
1960			0.50	**1999**	0.63	0.58	0.64
1970			0.54	**2001**	0.63	0.58	0.64
1981			0.57	**2002**	0.62	0.55	0.63
1983			0.58	**2003**	0.61	0.56	0.62
1984			0.58	**2004**	0.60	0.55	0.61
1985			0.59	**2005**	0.60	0.54	0.61
1986			0.58	**2006**	0.60	0.54	0.61
1987			0.59	**2007**	0.58	0.56	0.59
1988			0.61	**2008**	0.59	0.53	0.59
1989	0.61	0.57	0.63	**2009**	0.57	0.52	0.58
1990	0.61	0.55	0.63	**2011**	0.55	0.53	0.56
1993	0.60	0.59	0.62	**2012**	0.56	0.52	0.57
1996	0.62	0.58	0.64				

Sources: Fox (1983), UNU-WIDER (2008), CEPAL (2013)

Table 3.2. Agrarian structure of Brazil (1950-60)

	% of farms	% of land	% value of agricultural product	% labor employed
Minifundios	22.5	0.5	3	11
Family farms	39.1	6.0	18	26
Medium sized farms	34.0	34.0	43	42
Latifundios	4.7	59.5	36	21

Sources: Furtado (1976). The table was also published in Barraclough and Domike (1966), which allowed for corrections to Furtado's table.

Table 3.3. Land inequality in Brazil (1960-2006)

	1960	**1970**	**1975**	**1980**	**1985**	**1995**	**2006**
Inequality in land ownership	0.842	0.844	0.855	0.857	0.858	0.857	0.856
Inequality in operational holdings	0.787				0.802		

Sources: Alston and Libecap (1999); Frankema (2005); Hoffmann and Ney (2010)

Table 3.4. The Gini coefficient values for Korea (1965 - 2010)

	non-agricultural	agricultural	total
1965	0.417	0.285	0.344
1970	0.346	0.295	0.332
1976	0.412	0.337	0.391
1982	0.371	0.306	0.357
1988	0.350	0.290	0.336
1990	0.324	0.299	0.323
1993	0.310	0.306	0.310
1995			0.335
1996			0.326
1997			0.317
1998			0.369
2004			0.316
2006			0.306
2007			0.312
2008			0.314
2009			0.314
2010			0.310

Sources: Choo (1985); Kwack and Lee (2007); UNU-WIDER (2008); Kim (2011)

Table 3.5. The agrarian structure in Korea before and after land reform

Tenure category	1945	1954
Full owner	13.8	50.4
Part owner	34.7	39.3
Full tenant	48.8	7.2
Other	2.7	3.1

Source: Griffin, Khan and Ickowitz (2002)

Table 3.6. The Gini coefficient values for Turkey (1968-2012)

	urban	rural	total
1968	0.50		
1973	0.46		
1987	0.44	0.42	0.43
1994	0.51	0.41	0.49
2002	0.44	0.42	0.44
2003	0.42	0.39	0.42
2004	0.39	0.37	0.40
2005	0.38	0.37	0.38
2006	0.42	0.41	0.43
2007	0.39	0.38	0.41
2008	0.40	0.38	0.41
2009	0.41	0.38	0.42
2010	0.39	0.38	0.40
2011	0.39	0.39	0.40
2012	0.39	0.38	0.40

Sources: Bulutay, Timur and Ersel (1971), SPO (1976), SIS(1990), SIS(1996), TUIK (2013) Note: Bulutay, Timur and Ersel (1971) and SPO (1976)'s estimates of total and rural Gini coefficients for 1968 and 1973 are not reported, as the estimation methods used to calculate rural income Gini coefficients are not consistent with the standard methodology. Unlike the remaining inequality data on Turkey, rural income inequality values in these studies do not rely on household surveys. They are estimated using the land distribution in agricultural surveys.

Table 3.7. Land distribution in Turkey (1950-2002)

	1950	1970	1991	2001
Midnorth	0.63	0.57	0.55	0.54
Aegean	0.76	0.54	0.51	0.5
Marmara	0.47	0.53	0.52	0.52
Mediterranean	0.93	0.64	0.6	0.61
Northeast	0.58	0.59	0.59	0.5
Southeast	0.8	0.7	0.7	0.66
Black Sea	0.47	0.53	0.48	0.51
Mideast	0.66	0.57	0.56	0.52
Midsouth	0.74	0.59	0.41	0.58
Turkey	**0.73**	**0.62**	**0.62**	**0.62**

Source: Köymen and Öztürkcan (1999), Ünal (2012) Note: The land Gini coefficient values indicate the land holding distribution for operational units. Ünal (2012) finds that the land ownership Gini in 2002 is 0.65, which is slightly higher than landholding Gini for rural Turkey.

Table 3.8. Impact of land distribution on education in Turkey's provinces (2012/2013)

	Teachers in Primary Schools (per 100 students)		**Teachers in Secondary Schools (per 100 students)**		**Rate of Secondary Schooling (%, Net)**	
	(1)	(2)	(3)	(4)	(5)	(6)
Land Gini (2000/01)	-3.588***	-2.496**	-4.759***	-3.243***	-58.059***	-35.417***
	(0.985)	(1.037)	(1.198)	(1.136)	(13.099)	(11.396)
Log_GDP (2000)	1.024***	0.627*	1.224***	0.673**	21.336***	13.098***
	(0.227)	(0.338)	(0.259)	(0.353)	(2.841)	(2.802)
Urbanization (2000)	-0.015**	-0.014*	-0.014	-0.012	0.101	0.130
	(0.008)	(0.007)	(0.009)	(0.009)	(0.093)	(0.083)
Log_Pop. Density (2000)	-0.639***	-0.664***	-0.596***	-0.630***	-3.472**	-3.989***
	(0.216)	(0.224)	(0.194)	(0.206)	(1.547)	(1.510)
Kurdish Party (2002)		-0.783*		-1.088**		-16.245***
		(0.452)		(0.440)		(3.890)
Constant	3.155*	5.848***	1.751	5.491**	-56.800**	-0.945
	(1.678)	(2.024)	(1.887)	(2.282)	(23.033)	(20.403)
No of observations	81	81	81	81	81	81
Adjusted R-squared	0.44	0.48	0.44	0.51	0.61	0.71

Notes: Robust standard errors are reported in parentheses. *, **, *** denote 1%, 5% and 10% confidence levels, respectively. Grades 1-8 and 9-12 are classified as primary and secondary education, respectively

Table 3.9. Average years of schooling in Turkey, Brazil and Korea

	Turkey		**Brazil**		**Korea**	
	Female	Total	Female	Total	Female	Total
1950	0.633	1.115	1.347	1.499	3.547	4.506
1955	0.799	1.39	1.593	1.758	4.005	5.127
1960	1.037	1.768	1.887	2.054	3.023	4.338
1965	1.225	2.087	2.233	2.377	4.27	5.471
1970	1.483	2.433	2.659	2.811	5.182	6.343
1975	2.046	2.925	2.489	2.57	6.223	7.277
1980	2.55	3.554	2.733	2.768	7.263	8.292
1985	3.526	4.579	3.803	3.702	8.138	9.145
1990	3.944	5.005	4.65	4.463	8.212	9.348
1995	4.352	5.447	5.445	5.35	9.75	10.566
2000	5.084	6.08	6.546	6.411	10.283	11.055
2005	5.551	6.474	7.262	7.168	10.824	11.467
2010	6.149	7.016	7.69	7.539	11.313	11.848

Source: Barro and Lee (2012)

Table 3.10. Public expenditure per student as a (%) of GDP per capita for primary, secondary and tertiary education in Korea, Turkey and Brazil (1979-2010)

	Primary			*Secondary*			*Tertiary*		
	Korea	**Turkey**	**Brazil**	**Korea**	**Turkey**	**Brazil**	**Korea**	**Turkey**	**Brazil**
1979	11.55	10.59		10.04	23.13		31.33	46.93	
1984	14.78	6.91		12.92	8.53		17.97	77.54	
1989	13.54	5.76	18.27	8.68	5.54		8.98		120.02
1995	15.70	8.82	18.16	11.44	6.18		5.63	39.16	109.77
1999	18.42		10.83	15.66		9.53	8.37	35.31	57.22
2004	18.07		12.79	23.53		11.53	8.42	29.63	32.61
2008	19.57	8.72	18.55	23.38	11.86	19.51	10.22	19.20	27.64
2009	23.28	10.25	20.15	23.81	12.61	20.52	13.16	19.26	28.40
2010		10.14	21.00		10.51	21.50		18.26	28.40

Sources: World Development Indicators (2013); Turkey's 2008-2010 data come from the author's calculations based on Bumko (2013), Yök (2013) and Turkstat (2013)

Table 3.11. Inequality of Education Opportunity in Korea, Turkey and Brazil based on PISA (Programme for International Student Assessment) subject test scores (2006)

	Korea	**Turkey**	**Brazil**
Reading	0.214	0.251	0.268
Mathematics	0.209	0.241	0.318
Science	0.173	0.249	0.286
Contribution of durables on IOp in Math scores	0.014	0.045	0.184

Source: Ferreira and Gignoux (2011)

Table 3.12. The impact of land Gini coefficient on urbanization (1960-2010) - (OLS regressions - dependent var: Level of urbanization(%))

	(1)	(2)	(3)	(4)
$Log(GDP)$	20.064***		15.487***	
	(0.936)		(1.430)	
$Log(K/L)$		14.460***		14.727***
		(0.916)		(0.969)
Korea	-0.915	-7.463***		
	(1.349)	(1.229)		
Brazil	20.528***	13.792***		
	(1.186)	(1.932)		
Land Gini			60.494***	47.779***
			(6.820)	(7.356)
Trade openness	0.191***	0.194***	0.387***	0.208***
	(0.045)	(0.055)	(0.072)	(0.068)
Constant	-127.769***	-92.873***	-123.478***	-121.842***
	(7.413)	(7.501)	(9.514)	(6.229)
Adj. R-squared	0.90	0.86	0.81	0.85
Observations	153	140	153	140

Notes: Robust standard errors are reported in parentheses. *, **, *** denote 1%, 5% and 10% confidence levels, respectively.

Table 3.13. The impact of land Gini coefficient on the education inequality (1960-2010) - (OLS regressions - dependent variables: Overall education Gini coefficient, Education Gini coefficient for male)

	Education Gini				*Education Gini (male)*			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log(GDP)	-0.100***	0.138***	-0.078**	0.073***	-0.097***	0.117***	-0.103***	0.002
	(0.028)	(0.025)	(0.032)	(0.018)	(0.025)	(0.026)	(0.025)	(0.022)
Korea	-0.110***	-0.107***			-0.101***	-0.099***		
	(0.040)	(0.021)			(0.037)	(0.019)		
Brazil	-0.059	0.159***			0.035	0.231***		
	(0.036)	(0.023)			(0.034)	(0.022)		
Land Gini			0.055	0.590***			0.323**	0.695***
			(0.150)	(0.071)			(0.122)	(0.078)
Trade openness	-0.003***	-0.002***	-0.004***	-0.001*	-0.002***	-0.001**	-0.002*	0.000
	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Urbanization		-0.011***		-0.009***		-0.010***		-0.007***
		(0.001)		(0.001)		(0.001)		(0.001)
Constant	1.473***	-0.045	1.236***	0.061	1.342***	-0.026	1.182***	0.365**
	(0.225)	(0.166)	(0.226)	(0.119)	(0.202)	(0.171)	(0.177)	(0.138)
Adj. R-squared	0.81	0.96	0.76	0.97	0.83	0.97	0.83	0.93
Observations	33	33	33	33	33	33	33	33

Notes: Robust standard errors are reported in parentheses. *, **, *** denote 10%, 5% and 1% confidence levels, respectively.

Table 3.14. The impact of land Gini coefficient on urbanization (1960-2010) - (2SLS-IV regressions - dependent var: Level of urbanization(%))

	(1)	(2)
$Log(K/L)$	17.855***	17.841***
	(1.029)	(1.160)
Korea	-10.212***	
	(1.530)	
Brazil	14.694***	
	(2.112)	
Land Gini		60.442***
		(9.204)
Trade openness	0.150***	0.197***
	(0.058)	(0.082)
Constant	-124.824***	-160.492***
	(9.540)	(10.910)
First stage for $log(K/L)$		
$Log(K/L)$ - 10y lag	0.718***	0.780***
	(0.028)	(0.027)
Kleibergen-Paap LM (p-values)	0.0000	0.0000
Kleibergen-Paap Wald F values	654.662	860.274
Observations	110	110

Notes: Robust standard errors are reported in parentheses. *, **, *** denote 10%, 5% and 1% confidence levels, respectively. Stock-Yogo weak ID critical test values are 16.38 for a 10% maximal IV size, 8.96 for a 15% maximal IV size, 6.66 for a 20% maximal IV size, and 5.53 for 25% maximal IV size.

Table 3.15. The impact of land Gini coefficient on the education inequality (1960-2010) - (2SLS-IV regressions - dependent variables: Overall education Gini coefficient, Education Gini coefficient for male)

	Education Gini		*Education Gini (male)*	
	(1)	(2)	(3)	(4)
Log(GDP)	0.133***	0.057***	0.102***	-0.033
	(0.024)	(0.017)	(0.024)	(0.023)
Korea	-0.094***		-0.081***	
	(0.023)		(0.019)	
Brazil	0.152***		0.220***	
	(0.026)		(0.026)	
Land Gini		0.462***		0.456***
		(0.078)		(0.097)
Trade openness	-0.002***	-0.002***	-0.001***	-0.001*
	(0.001)	(0.001)	(0.001)	(0.001)
Urbanization	-0.011***	-0.008***	-0.009***	-0.004***
	(0.001)	(0.001)	(0.001)	(0.001)
Constant	-0.027	0.201*	0.055	0.670***
	(0.163)	(0.118)	(0.157)	(0.169)
First stage for urbanization				
Agglomeration - 10y lag	1.967***	1.062***	1.967***	1.062***
	(0.164)	(0.165)	(0.164)	(0.165)
Kleibergen-Paap LM (p-value)	0.0018	0.0001	0.0018	0.0001
Kleibergen-Paap Wald F value	143.194	41.54	143.194	41.54
Observations	27	27	27	27

Notes: Robust standard errors are reported in parentheses. *, **, *** denote 10%, 5% and 1% confidence levels, respectively. Stock-Yogo weak ID test critical values are 16.38 for 10% maximal IV size, 8.96 for 15% maximal IV size 6.66, for 20% maximal IV size, 5.53 for 25% maximal IV size.

Table 3.16. The impact of the land Gini coefficient on urban and overall income inequality (1960-2010) - (OLS regressions - dependent vars: Overall and Urban Income Gini coefficients)

	Overall Income Gini		*Urban Income Gini*	
	(1)	(2)	(3)	(4)
$Log(GDP)$	0.598**	0.205	0.736**	0.220
	(0.269)	(0.258)	(0.293)	(0.387)
$(Log\_GDP)^2$	-0.034**	-0.012	-0.046**	-0.019
	(0.015)	(0.014)	(0.017)	(0.023)
Korea	-0.058***		-0.062***	
	(0.018)		(0.017)	
Brazil	0.180***		0.156***	
	(0.016)		(0.013)	
Land Gini		0.569***		0.678***
		(0.054)		(0.118)
Trade openness	0.001	0.001	-0.001	0.001
	(0.001)	(0.000)	(0.001)	(0.001)
Constant	-2.193*	-0.703	-2.487*	-0.426
	(1.229)	(1.139)	(1.261)	(1.611)
Adj. R-squared	0.95	0.92	0.95	0.91
Observations	48	48	31	31

Notes: Robust standard errors are reported in parentheses. *, **, *** denote 10%, 5% and 1% confidence levels, respectively.

Table 3.17. The impact education inequality and level of urbanization on urban and overall income inequality (1960-2010) - (OLS regressions - dependent vars: Overall and Urban Income Gini coefficients)

	Overall Income Gini		*Urban Income Gini*	
	(1)	(2)	(3)	(4)
$Log(GDP)$	-1.509***	-1.052	-1.761	-0.068
	(0.416)	(0.920)	(1.878)	(2.217)
$(Log\_GDP)^2$	0.074***	0.052	0.088	-0.005
	(0.022)	(0.048)	(0.105)	(0.118)
Trade openness	0.001*	0.001	0.003	0.001
	(0.000)	(0.000)	(0.003)	(0.001)
Urbanization	0.011***	0.009***	0.014***	0.010***
	(0.001)	(0.002)	(0.004)	(0.003)
Education Gini - 10y lag	0.850***		1.182**	
	(0.120)		(0.578)	
Education Gini (male) - 10y lag		0.803***		0.757***
		(0.112)		(0.252)
Gender education ratio - 10y lag		-0.142		-0.218
		(0.164)		(0.266)
Constant	6.802***	4.723	7.580	0.446
	(2.044)	(4.300)	(7.971)	(10.215)
First stage for urbanization				
Agglomeration - 20y lag	1.526***	1.039***	1.111***	0.519**
	(0.087)	(0.127)	(0.158)	(0.233)
Education Gini - 20y lag	43.326***		-7.906	
	(10.975)		(21.898)	
Education Gini (male) - 20y lag		30.024***		43.811*
		(7.472)		(22.987)
First stage for education Gini - 10y lag				
Agglomeration - 20y lag	-0.002		-0.004**	
	(0.001)		(0.001)	
Education Gini - 20y lag	0.604***		0.605***	
	(0.001)		(0.183)	
First stage for education Gini (male) - 10y lag				
Agglomeration - 20y lag		0.001		-0.006**
		(0.001)		(0.002)
Education Gini (male) - 20y lag		0.568***		0.780**
		(0.130)		(0.332)
Kleibergen-Paap LM (p-value)	0.0086	0.0037	0.0281	0.0358
Kleibergen-Paap Wald F value	14.595	12.064	2.985	1.688
Observations	43	43	26	26

Notes: Robust standard errors are reported in parentheses. *, **, *** denote 10%, 5% and 1% confidence levels, respectively. Stock-Yogo weak ID test critical values are 7.03 for 10% maximal IV size, 4.58 for 15% maximal IV size 3.95, for 20% maximal IV size, 3.63 for 25% maximal IV size.

Table 4.1. Average yearly rates of urbanization in developed and developing economies for different per capita income groups

	Developing					**Developed**
	$0-2500	**$2500-5000**	**$5000-10000**	**$10000 <**	**All**	
1980s	0.447	0.636	0.720	0.292	0.547	0.272
1990s	0.353	0.537	0.538	0.621	0.448	0.190
2000s	0.423	0.351	0.407	0.390	0.404	0.234

Sources: World Development Indicators (2013), Penn World Tables 7.1 (2013)

Table 4.2. Average yearly point (%) changes in the employment shares of agriculture, industry and services in developed and developing economies for different per capita income groups

		Developing					**Developed**
		$0-2500	**$2500-5000**	**$5000-10000**	**$10000 <**	**All**	
1980s	*Agriculture*	-0.538	-0.843	-0.358	-0.276	-0.469	-0.166
	Industry	0.122	0.380	0.089	-0.462	-0.054	-0.433
	Services	0.383	0.530	0.175	0.728	0.509	0.616
1990s	*Agriculture*	-0.706	-0.441	-0.659	-0.301	-0.566	-0.213
	Industry	0.097	-0.259	0.000	-0.100	-0.054	-0.437
	Services	0.634	0.698	0.720	0.398	0.651	0.630
2000s	*Agriculture*	-0.627	-0.779	-0.606	-0.332	-0.620	-0.142
	Industry	0.972	0.217	-0.061	-0.272	0.174	-0.481
	Services	0.391	0.576	0.610	0.592	0.558	0.582

Sources: Key Indicators of the Labour Market (2013), Penn World Tables 7.1 (2013)

Table 4.3. Ratio of value added to employment shares of agriculture, industry and services in developed and developing economies for different per capita income groups

		Developing					Developed
		$0-2500	**$2500-5000**	**$5000-10000**	**$10000 <**	**All**	
1980s	*Agriculture*	0.46	0.61	0.39	0.53	0.50	0.72
	Industry	2.94	1.65	1.47	1.25	1.78	1.13
	Services	2.33	1.27	1.16	0.97	1.39	0.97
1990s	*Agriculture*	0.57	0.72	0.42	0.31	0.52	0.61
	Industry	3.60	1.45	1.56	1.96	2.47	1.16
	Services	2.61	1.11	1.11	0.93	1.74	0.99
2000s	*Agriculture*	0.59	0.51	0.41	0.31	0.49	0.58
	Industry	3.18	1.60	1.52	2.12	2.30	1.15
	Services	1.86	1.19	1.07	0.85	1.40	0.98

Sources: Key Indicators of the Labour Market (2013), World Development Indicators (2013), Penn World Tables 7.1 (2013)

Table 4.4. Point change in the education Gini coefficient in developed and developing economies for different per capita income groups

	Developing					**Developed**
	$0-2500	**$2500-5000**	**$5000-10000**	**$10000 <**	**All**	
1980s	-0.068	-0.074	-0.059	-0.031	-0.062	0.003
1990s	-0.061	-0.082	-0.055	-0.075	-0.065	-0.031
2000s	-0.069	-0.056	-0.053	-0.054	-0.060	-0.033

Sources: Benaabdelaali, Hanchane, and Kamal (2012), Penn World Tables 7.1 (2013)

Table 4.5. The impact of per capita income on income inequality: Only developing countries and all countries. (Fixed Effects IV regressions (2SLS) - Dependent Variable: Income Gini coefficient)

	All countries				*Developing countries*	
	(1)	(2)	(3)	(4)	(5)	(6)
Expenditure	-6.622***	-6.326***	-6.069***	-5.782***	-7.391***	-7.222***
	(1.258)	(1.214)	(1.282)	(1.235)	(1.434)	(1.386)
$Log(GDP)$	215.573***	215.593***	-2.857	0.663	31.023***	32.373***
	(42.463)	(41.888)	(4.286)	(4.691)	(12.069)	(12.041)
$(Log(GDP))^2$	-24.972***	-24.810***	0.091	-0.128	-1.964***	-2.061***
	(4.812)	(4.720)	(0.230)	(0.251)	(0.762)	(0.759)
$(Log(GDP))^3$	0.945***	0.932***				
	(0.180)	(0.176)				
Log(Trade openness)	0.618	0.583	1.055	0.984	0.079	0.350
	(0.739)	(0.779)	(0.774)	(0.814)	(1.047)	(1.078)
Government Exp/GDP		-0.444***		-0.450***		-0.277**
		(0.105)		(0.104)		(0.121)
Recession		0.321		0.366		0.716***
		(0.272)		(0.276)		(0.396)
First-stage for $Log(GDP)$						
$Log(GDP)$ - 10y lag	5.399***	5.637***	1.252***	1.455***	2.775***	2.795***
	(1.308)	(1.185)	(0.170)	(0.170)	(0.332)	(0.306)
$(Log(GDP))^2$ - 10y lag	-0.520***	-0.538***	-0.030***	-0.042***	-0.133***	-0.133***
	(0.155)	(0.140)	(0.009)	(0.009)	(0.021)	(0.019)
$(Log(GDP))^3$ - 10y lag	0.019***	0.019***				
	(0.006)	(0.005)				
First-stage for $(Log(GDP))^2$						
$Log(GDP)$ - 10y lag	69.203***	73.676***	7.521***	11.290***	33.916***	34.265***
	(21.745)	(19.728)	(2.755)	(2.730)	(5.484)	(5.025)
$(Log(GDP))^2$ - 10y lag	-6.968***	-7.294***	0.333**	0.103	-1.458***	-1.471***
	(2.616)	(2.360)	(0.146)	(0.148)	(0.353)	(0.323)
$(Log(GDP))^3$ - 10y lag	0.284***	0.288***				
	(0.103)	(0.093)				
First-stage for $(Log(GDP))^3$						
$Log(GDP)$ - 10y lag	753.973***	818.758***				
	(285.975)	(262.508)				
$(Log(GDP))^2$ - 10y lag	-84.223**	-89.008***				
	(34.728)	(31.619)				
$(Log(GDP))^3$ - 10y lag	3.884***	3.950***				
	(1.376)	(1.248)				
Kleibergen-Paap rk Wald F values	43.59	43.43	224.52	225.93	26.44	31.83
Turning Points	1948, 23199	1967, 26152			2695	2572
No. of Observations	1021	974	1021	974	502	498
No. of Groups	95	92	95	92	70	69

Notes: All panel regressions include a country fixed effect and robust standard errors clustered by country. *, **, *** denote 10%, 5% and 1% confidence levels, respectively. The developing countries in the regressions are countries that are not classified as having a very high human development level in the 2010 HDI rankings.

Table 4.6. The impact of education inequality, nonagricultural sector's value added and employment shares on income inequality: Only developing countries (Fixed Effects regressions - Dependent Variable: Income Gini coefficient)

	(1)	(2)	(3)	(4)	(5)	(6)
Expenditure	-5.627**	-5.503**	1.942***	2.247***	1.412	1.118
	(2.274)	(2.247)	(0.607)	(0.601)	(1.135)	(0.994)
Education Gini - 10y lag	9.922*	9.901*	7.395	3.931	2.138	0.417
	(5.844)	(5.915)	(7.410)	(6.089)	(7.052)	(6.095)
Nonagri VA			0.245**		0.187	
			(0.102)		(0.113)	
Nonagri Emp			-0.155**		-0.099	
			(0.075)		(0.070)	
Nonagri Gap				0.171***		0.122**
				(0.059)		(0.048)
Log(Trade openness)	1.094	1.183	1.806	1.958	1.638	1.584
	(1.441)	(1.453)	(2.030)	(1.739)	(2.215)	(2.130)
Government Exp/GDP		-0.214	-0.035	-0.066	-0.274	-0.286
		(0.135)	(0.223)	(0.239)	(0.233)	(0.251)
Recession		0.599	0.268	0.301	0.299	0.320
		(0.416)	(0.459)	(0.430)	(0.452)	(0.433)
$Log(GDP)$					42.993***	48.382***
					(15.079)	(17.221)
$(Log(GDP))^2$					-2.658***	-2.924***
					(0.865)	(0.984)
Constant	39.640***	40.930***	27.305**	36.052***	-138.566**	-156.647**
	(7.492)	(7.197)	(11.601)	(9.185)	(61.986)	(68.840)
R-squared	0.14	0.16	0.09	0.08	0.15	0.15
No. of Observations	495	491	273	273	273	273
No. of Groups	71	70	51	51	51	51

Notes: Robust standard errors are reported in parentheses. *, **, *** denote 10%, 5% and 1% confidence levels, respectively. The developing countries in the regressions are countries that are not classified as having a very high human development level in the 2010 HDI rankings.

Table 4.7. The impact of education inequality and nonagricultural sectors' value added-employment gap on income inequality: Only developing countries (Fixed Effects IV regressions (2SLS) - Dependent Variable: Income Gini coefficient)

	(1)	(2)	(3)	(4)
Expenditure	-6.098***	-5.853***	2.630**	1.012
	(1.554)	(1.516)	(1.311)	(1.578)
Education Gini - 10y lag	9.406**	10.004**	10.375*	8.658
	(4.220)	(4.288)	(5.965)	(8.685)
Nonagri Gap			0.244***	0.149
			(0.085)	(0.091)
Log(Trade openness)	0.977	1.118	2.327*	1.710
	(0.815)	(0.817)	(1.226)	(1.279)
Government Exp/GDP		-0.196*	-0.228	-0.439**
		(0.106)	(0.153)	(0.174)
Recession		0.576	0.211	0.154
		(0.398)	(0.434)	(0.428)
$Log(GDP)$				52.145***
				(15.254)
$(Log(GDP))^2$				-3.100***
				(0.892)
First-stage for Education Gini - 10y lag				
Education Gini - 20y lag	0.891***	0.890***	0.716***	0.653***
	(0.043)	(0.042)	(0.072)	(0.112)
Nonagri Gap - 3y lag			0.000	0.000
			(0.001)	(0.001)
First-stage for Nonagri Gap				
Education Gini - 20y lag			-4.946	-14.200**
			(4.913)	(5.841)
Nonagri Gap - 3y lag			0.632***	0.571***
			(0.080)	(0.075)
Kleibergen-Paap rk Wald F values	426.31	446.54	25.73	30.29
No. of Observations	467	463	220	220
No. of Groups	65	64	27	27

Notes: All panel regressions include a country fixed effect and robust standard errors clustered by country. *, **, *** denote 10%, 5% and 1% confidence levels, respectively. Stock-Yogo weak ID critical test values are 16.38 for a 10% maximal IV size, 8.96 for a 15% maximal IV size, 6.66 for a 20% maximal IV size, and 5.53 for 25% maximal IV size for (1) and (2); 7.03 for a 10% maximal IV size, 4.58 for a 15% maximal IV size, 3.95 for a 20% maximal IV size, and 3.63 for 25% maximal IV size for (3) and (4). The developing countries in the regressions are countries that are not classified as having a very high human development level in the 2010 HDI rankings.

Table 4.8. The impact of nonagricultural informal employment, education inequality and nonagricultural sectors' value added-employment gap on income inequality: Only developing countries (Fixed Effects Regressions - Dependent Variable: Income Gini coefficient)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Expenditure	-14.084***	-14.314***	-14.310***	-12.296***	-	-	-
	(0.924)	(0.901)	(0.846)	(1.566)			
$InformalEmp$	0.104**	-0.159	0.092**	0.113**	0.121***	0.341	0.135**
	(0.043)	(0.261)	(0.043)	(0.044)	(0.041)	(0.353)	(0.057)
$(InformalEmp)^2$		0.002				-0.002	
		(0.002)				(0.003)	
Log(Trade openness)	-1.140	-1.497	0.593	0.333	2.688	2.975	3.195
	(2.228)	(2.202)	(2.333)	(2.364)	(1.960)	(2.147)	(2.265)
Education Gini - 10y lag				13.293*	-3.048	-2.912	-6.200
				(7.544)	(12.018)	(11.798)	(13.069)
Nonagri Gap					0.227**	0.222**	0.188
					(0.096)	(0.097)	(0.121)
$Log(GDP)$			43.674				-2.191
			(30.619)				(55.200)
$(Log(GDP))^2$			-2.878				0.021
			(1.892)				(3.351)
Constant	50.422***	58.637***	-117.901	36.630***	27.297**	20.390	43.773
	(9.123)	(12.545)	(120.828)	(10.796)	(11.653)	(18.590)	(225.431)
R-squared	0.22	0.23	0.28	0.27	0.26	0.27	0.27
No. of Observations	86	86	86	82	55	55	55
No. of Groups	41	41	41	37	27	27	27

Notes: Robust standard errors are reported in parentheses. *, **, *** denote 10%, 5% and 1% confidence levels, respectively. The developing countries in the regressions are countries that are not classified as having a very high human development level in the 2010 HDI rankings.

Table 4.9. The impact of nonagricultural self-employment, education inequality and nonagricultural sectors' value added-employment gap on income inequality: All countries (Fixed Effects Regressions - Dependent Variable: Income Gini coefficient)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Expenditure	-5.258***	-5.500*	-5.916*	-4.889	-	-	-
	(3.141)	(2.972)	(3.251)	(3.135)			
$Self - Employment$	0.093	0.007	0.058	0.123	0.151**	0.136	0.121**
	(0.090)	(0.184)	(0.075)	(0.088)	(0.061)	(0.155)	(0.052)
$(Self - Employment)^2$		0.001				0.000	
		(0.003)				(0.002)	
Log(Trade openness)	-2.832*	-2.905**	-2.022	-1.185	3.163*	3.132*	2.469
	(1.116)	(1.107)	(1.478)	(1.340)	(1.630)	(1.701)	(1.610)
Education Gini - 10y lag				9.692	16.841*	17.135	17.222
				(6.755)	(8.962)	(8.981)	(10.314)
Nonagri Gap					0.320***	0.315***	0.232**
					(0.098)	(0.112)	(0.107)
$Log(GDP)$			157.560				243.695***
			(118.431)				(59.712)
$(Log(GDP))^2$			-18.168				-27.658***
			(13.178)				(6.860)
$(Log(GDP))^3$			0.684				1.033***
			(0.485)				(0.265)
Constant	48.710***	50.122***	-397.942	36.945***	11.343	11.587	-690.011***
	(5.278)	(4.823)	(351.638)	(8.230)	(9.579)	(10.292)	(177.368)
R-squared	0.16	0.16	0.21	0.18	0.32	0.32	0.41
No. of Observations	162	162	162	155	90	90	90
No. of Groups	67	67	67	61	41	41	41

Notes: Robust standard errors are reported in parentheses. *, **, *** denote 10%, 5% and 1% confidence levels, respectively.

Table 4.10. The impact of per capita income on nonagricultural sectors' value added-employment gap and ratio: Only developing countries (Fixed Effects IV (2SLS) regressions - Dependent Variables: Nonagri Gap and Nonagri Ratio)

	Nonagri Gap				*Nonagri Ratio*	
	(1)	(2)	(3)	(4)	(5)	(6)
$Log(GDP)$	-6.803***	-5.991***	28.877***	29.534***	-0.240***	-0.136
	(0.714)	(0.872)	(7.873)	(7.818)	(0.034)	(0.274)
$(Log(GDP))^2$			-2.189***	-2.193***		-0.006
			(0.501)	(0.506)		(0.017)
Log(Trade openness)		-1.658		-1.229	-0.139***	-0.138***
		(0.862)		(0.913)	(0.043)	(0.042)
First-stage for $Log(GDP)$						
$Log(GDP)$	0.856***	0.742***	2.522	2.233***	0.742***	2.233***
	(0.030)	(0.031)	(0.245)	(0.230)	(0.031)	(0.230)
$(Log(GDP))^2$			-0.106***	-0.095***		-0.095***
			(0.016)	(0.015)		(0.015)
First-stage for $(Log(GDP))^2$						
$Log(GDP)$			31.649***	26.570***		26.570***
			(4.294)	(3.990)		(3.990)
$(Log(GDP))^2$			-1.129**	-0.923***		-0.923***
			(0.283)	(0.263)		(0.263)
Kleibergen-Paap rk Wald F values	815.96	475.19	59.28	50.13	475.19	50.13
Turning Points			732	840		
No. of Observations	754	748	754	748	748	748
No. of Groups	56	56	56	56	56	56

Notes: All panel regressions include a country fixed effect and robust standard errors clustered by country. *, **, *** denote 10%, 5% and 1% confidence levels, respectively. Stock-Yogo weak ID critical test values are 16.38 for a 10% maximal IV size, 8.96 for a 15% maximal IV size, 6.66 for a 20% maximal IV size, and 5.53 for 25% maximal IV size for (1),(2) and (5); 7.03 for a 10% maximal IV size, 4.58 for a 15% maximal IV size, 3.95 for a 20% maximal IV size, and 3.63 for 25% maximal IV size for (3),(4) and (6). The developing countries in the regressions are countries that are not classified as having a very high human development level in the 2010 HDI rankings.

Table 4.11. The impact of per capita income on education inequality: Only developing countries (Fixed Effects IV (2SLS) regressions - Dependent Variable: Education Gini coefficient)

	(1)	(2)	(3)	(4)
$Log(GDP)$	-0.207***	-0.190***	0.720***	0.792***
	(0.015)	(0.019)	(0.161)	(0.152)
$(Log(GDP))^2$			-0.059***	-0.062***
			(0.010)	(0.010)
Log(Trade openness)		-0.027*		-0.031*
		(0.015)		(0.013)
Government Exp./GDP		-0.002*		-0.003*
		(0.001)		(0.001)
First-stage for $Log(GDP)$				
$Log(GDP)$	0.777***	0.704***	1.351***	1.474***
	(0.036)	(0.030)	(0.475)	(0.313)
$(Log(GDP))^2$			-0.038	-0.051**
			(0.030)	(0.020)
First-stage for $(Log(GDP))^2$				
$Log(GDP)$			11.835*	13.430***
			(6.836)	(4.745)
$(Log(GDP))^2$			0.024	-0.154
			(0.436)	(0.306)
Kleibergen-Paap rk Wald F values	475.22	557.49	31.06	64.92
Turning Points			445	576
No. of Observations	696	642	696	642
No. of Groups	72	70	72	70

Notes: All panel regressions include a country fixed effect and robust standard errors clustered by country. *, **, *** denote 10%, 5% and 1% confidence levels, respectively. Stock-Yogo weak ID critical test values are 16.38 for a 10% maximal IV size, 8.96 for a 15% maximal IV size, 6.66 for a 20% maximal IV size, and 5.53 for 25% maximal IV size for (1) and (2); 7.03 for a 10% maximal IV size, 4.58 for a 15% maximal IV size, 3.95 for a 20% maximal IV size, and 3.63 for 25% maximal IV size for (3) and (4). The developing countries in the regressions are countries that are not classified as having a very high human development level in the 2010 HDI rankings.

Table 4.12. The impact of GDP per capita on nonagricultural informal employment and nonagricultural self-employment: Only developing countries (Fixed effects regressions - Dependent Variables: Nonagricultural informal and nonagricultural self-employment rates)

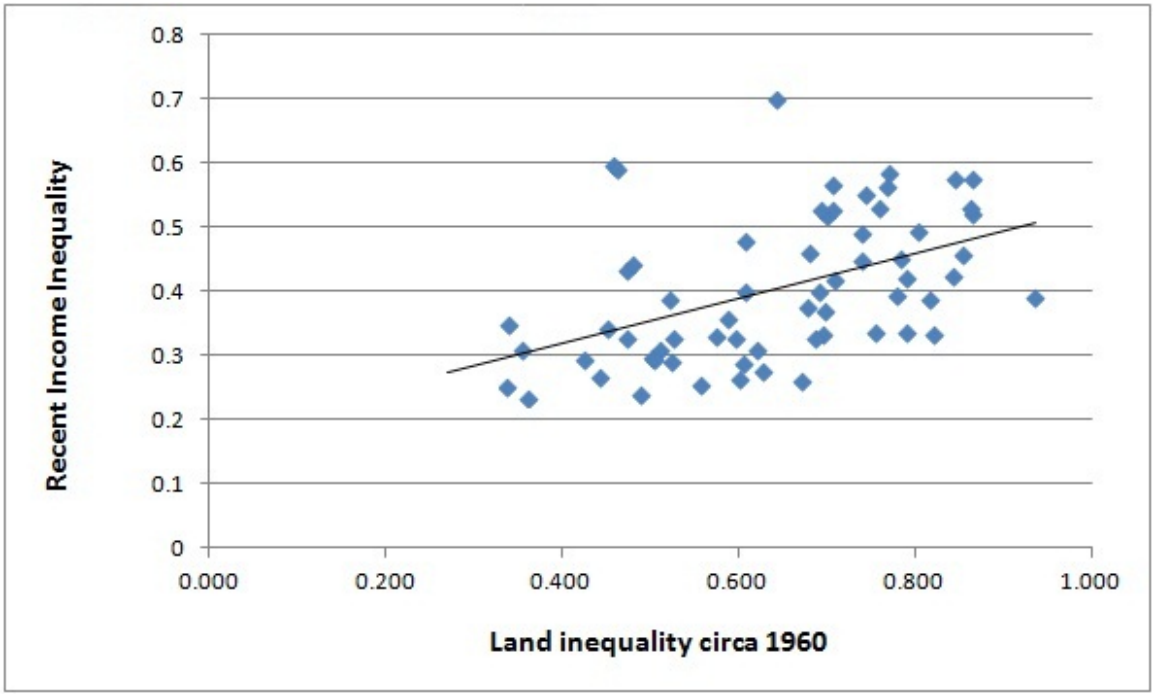
	Informal		*Self-Employment*	
	(1)	(2)	(3)	(4)
$Log(GDP)$	129.734**	130.307**	27.209*	25.385*
	(61.187)	(63.648)	(16.392)	(15.083)
$(Log(GDP))^2$	-7.593**	-7.601**	-1.466*	-1.394*
	(3.542)	(3.720)	(0.862)	(0.797)
Log (Trade openness)	1.533	1.319	4.816*	3.747
	(5.129)	(5.189)	(2.677)	(2.678)
Government Exp./GDP		0.115		-0.429
		(0.637)		(0.331)
Recession		0.051		-0.436
		(2.015)		(1.297)
Constant	-495.027*	-499.446**	-113.561	-95.021
	(251.970)	(260.164)	(77.529)	(72.746)
R-squared	0.11	0.11	0.09	0.10
Turning Point	5131	5283	10277	8982
No. of Observations	115	115	238	230
No. of Groups	50	50	89	86

Notes: All panel regressions include a country fixed effect and robust standard errors clustered by country. *, **, *** denote 10%, 5% and 1% confidence levels, respectively.

Table 4.13. Summary of estimates: Impact of income per capita on different variables in developing countries

	$445-576		$732-840		$1948-2695		$5131-5283		$8982-10277	
Income Inequality	+		+		+		-		-	-
Gap between nonagricultural and agricultural incomes	+		+		-		-		-	-
Informal employment in the nonagricultural sector	+		+		+		+		-	-
Self-employment in the nonagricultural sector	+		+		+		+		+	-
Education Inequality	+		-		-		-		-	-

Figure 2.1. Relationship between land inequality in the 1960s and income inequality today (Gini coefficients for 62 countries, corr = 0.48)



Note: See Appendix A for the data sources

Figure 2.2. Relationship between land inequality in the 1960s and income inequality today - Southern African countries excluded (Gini coefficients for 60 countries, corr = 0.58)

Note: See Appendix A for the data sources

Figure 2.3. The possible impacts of higher land inequality on income inequality

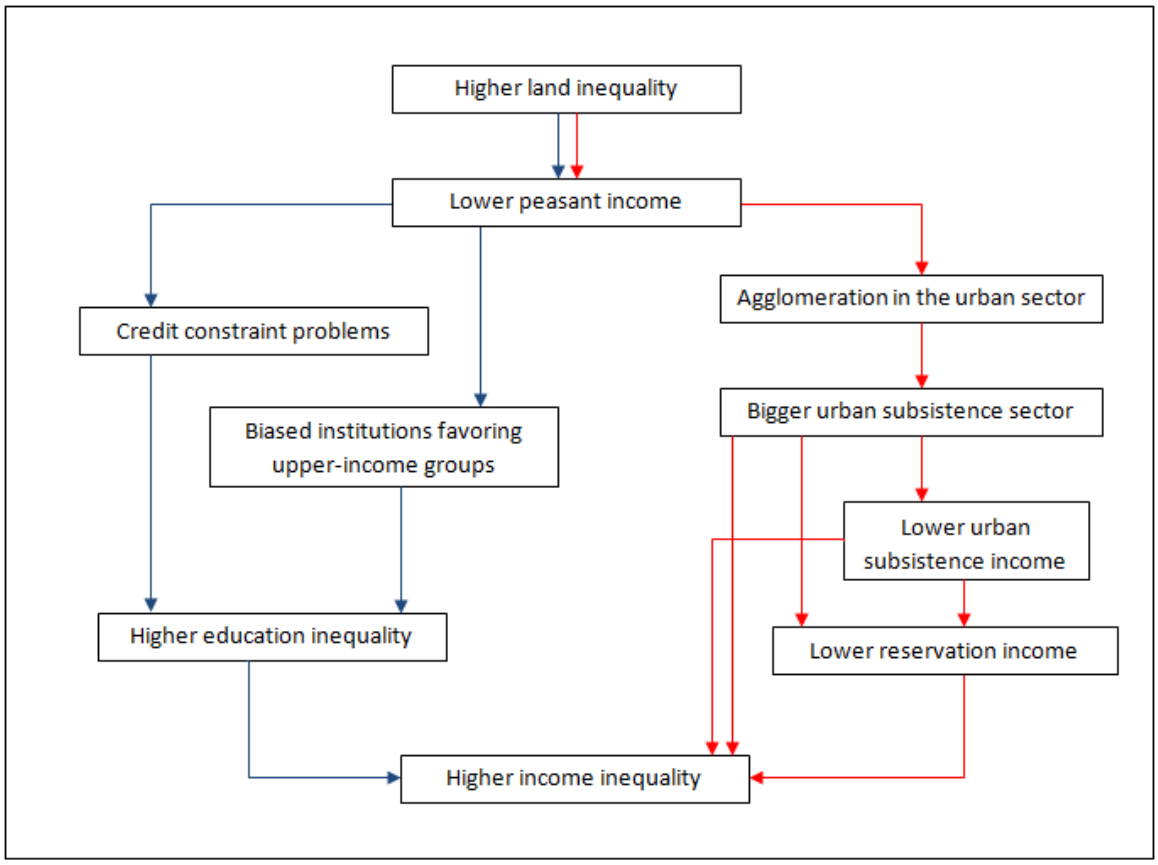


Figure 2.4. The impact of a fall in peasant income on the urban capitalist wages

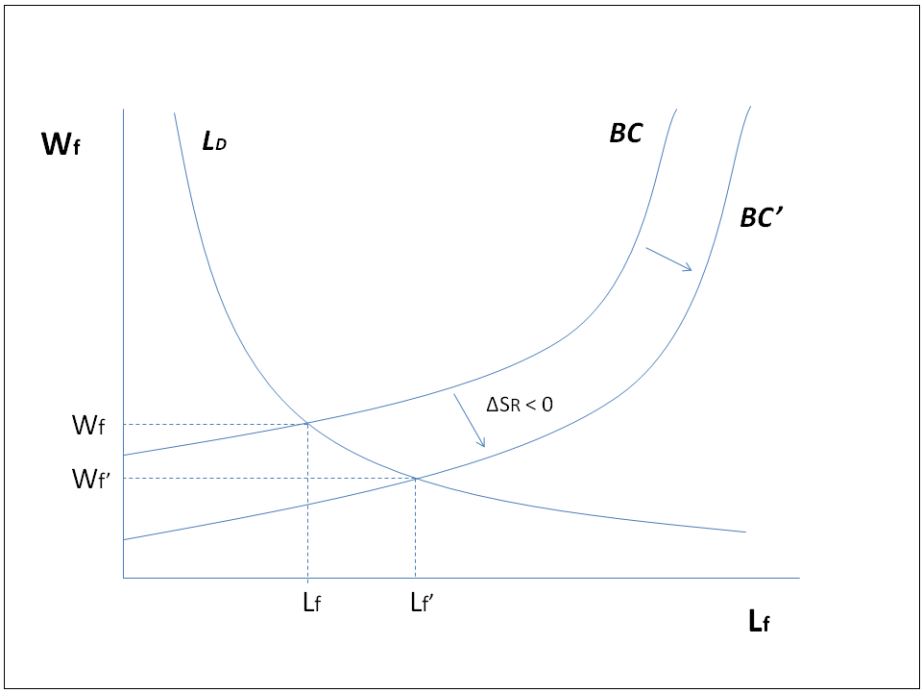


Figure 2.5. The impact of declining peasant income on urban inequality

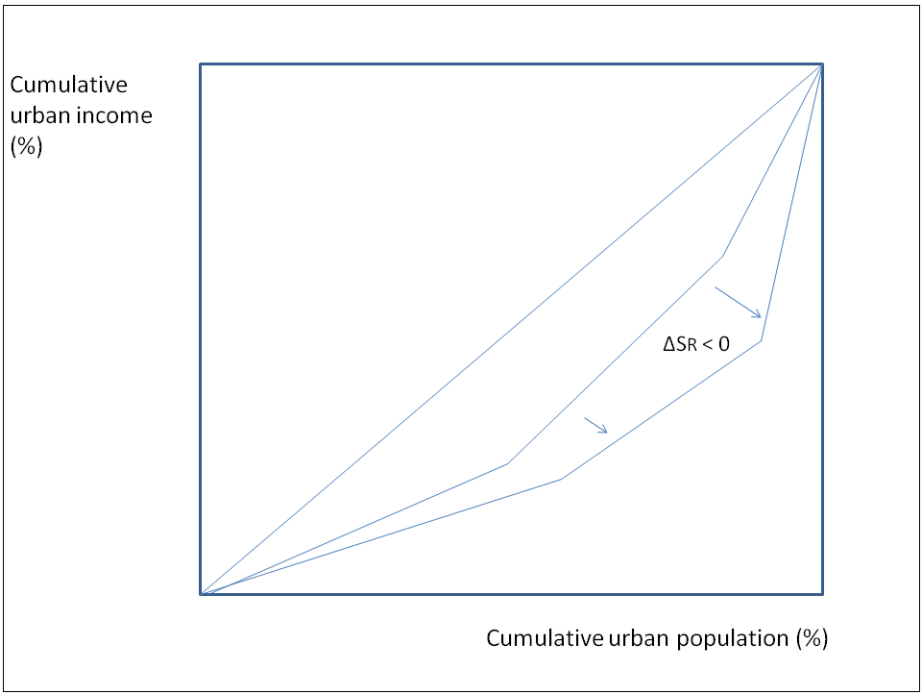


Figure 2.6. The impact of rising land concentration on urban inequality

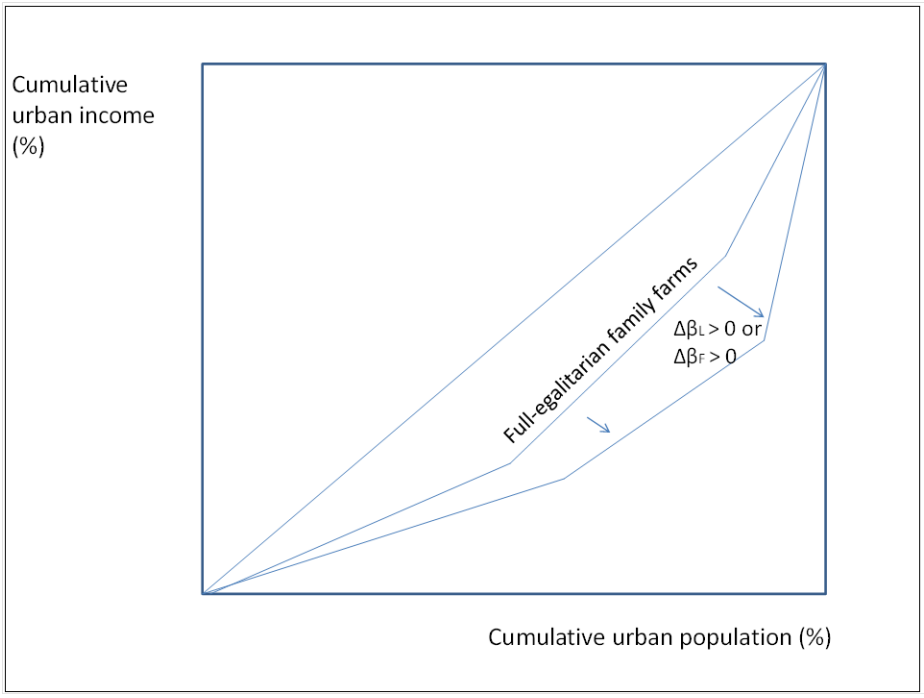
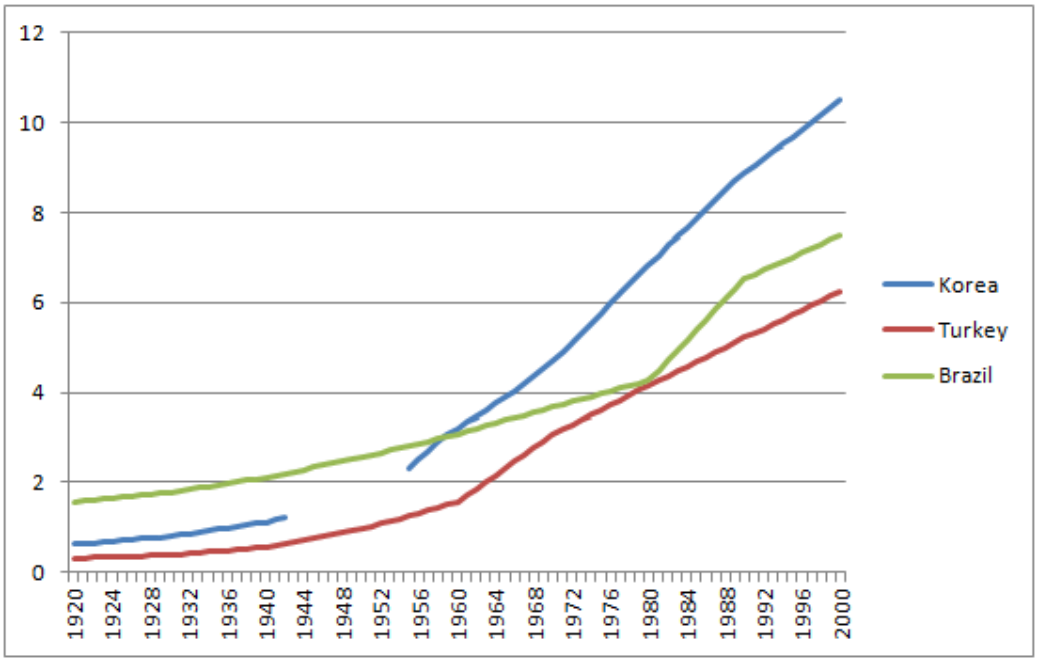
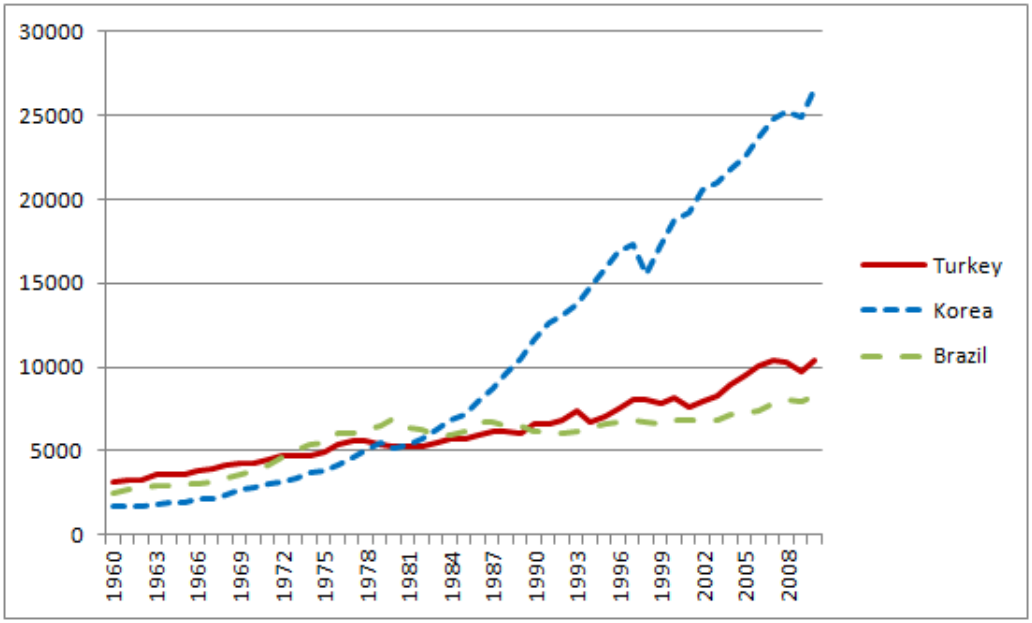


Figure 3.1. Average years of schooling in Korea, Turkey and Brazil (1920-2010)



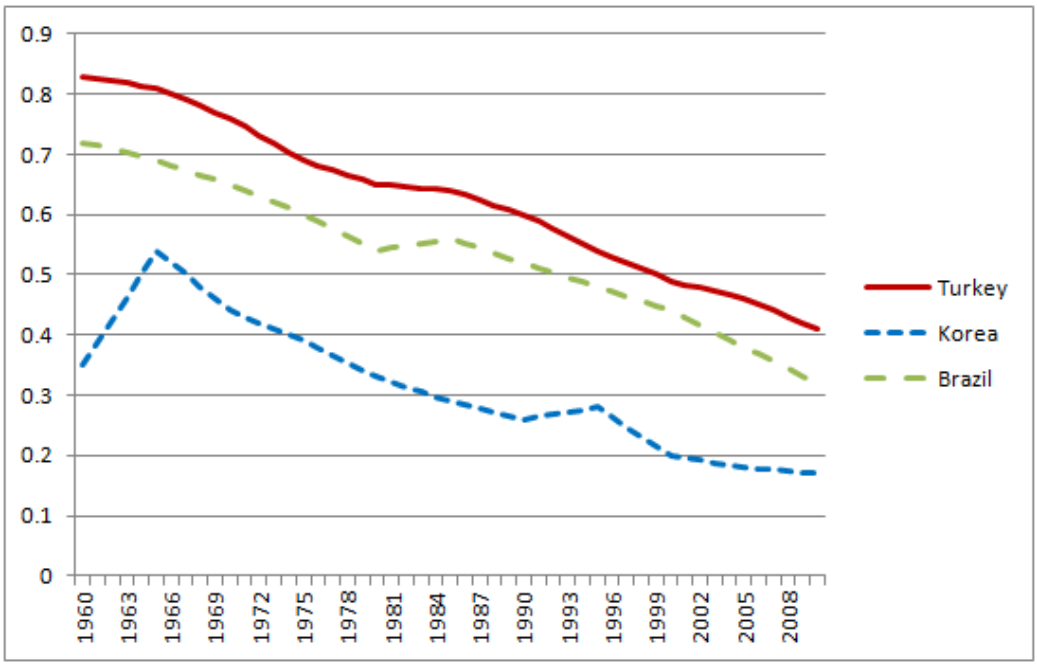
Sources: Morrisson and Murtin (2010); Godo (2011)
Note: The pre-1942 data reflect average years of schooling in Korea as a whole, whereas the post-1955 data only indicate the average years of schooling in South Korea. The data used here are slightly different from Barro and Lee (2012)'s data, which are used in the remainder of the paper.

Figure 3.2. GDP per capita (PPP, $) in Turkey, Korea and Brazil (1960-2010)



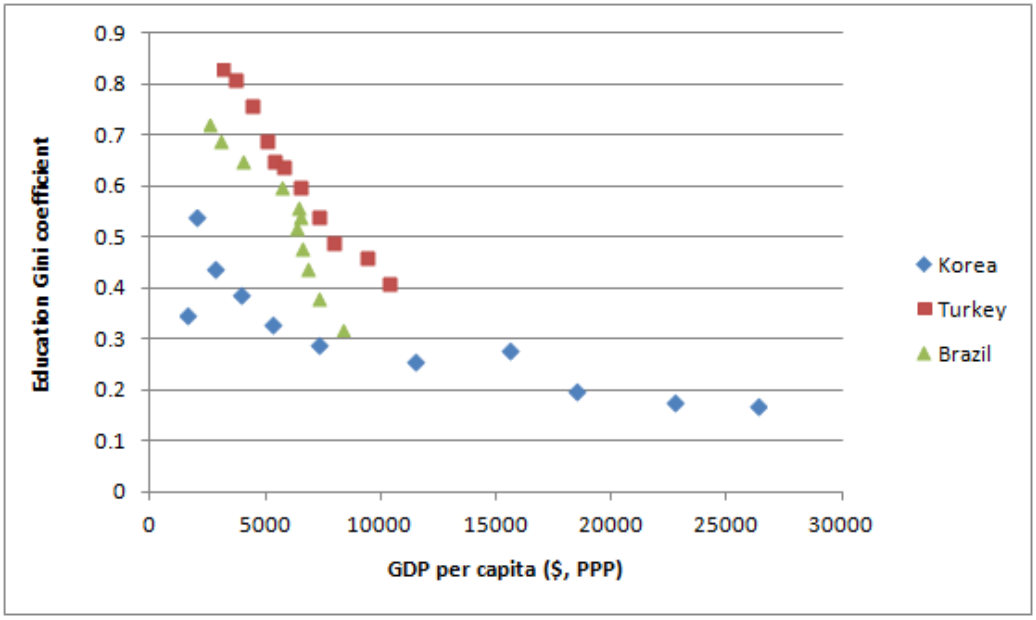
Source: Penn World Table 7.1(2013)

Figure 3.3. Education Gini coefficients in Korea, Turkey and Brazil (1960-2010)



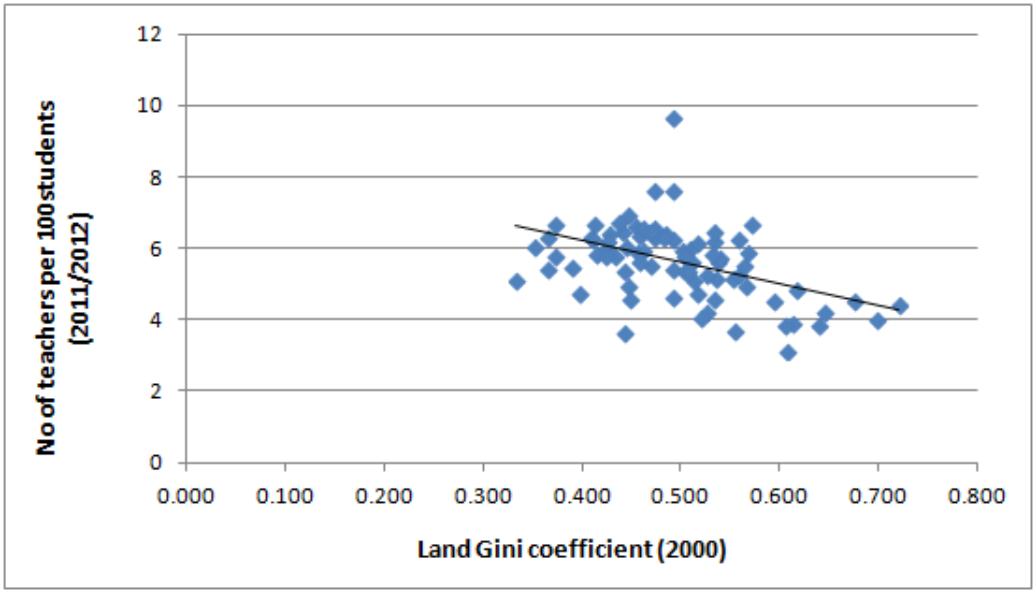
Source: Benaabdelaali, Hanchane and Kamal (2012)
Note: Education Gini coefficients measure inequalities in years of schooling.

Figure 3.4. Education Gini coefficients and GDP per capita ($, PPP) in Korea, Turkey and Brazil (1960-2010)



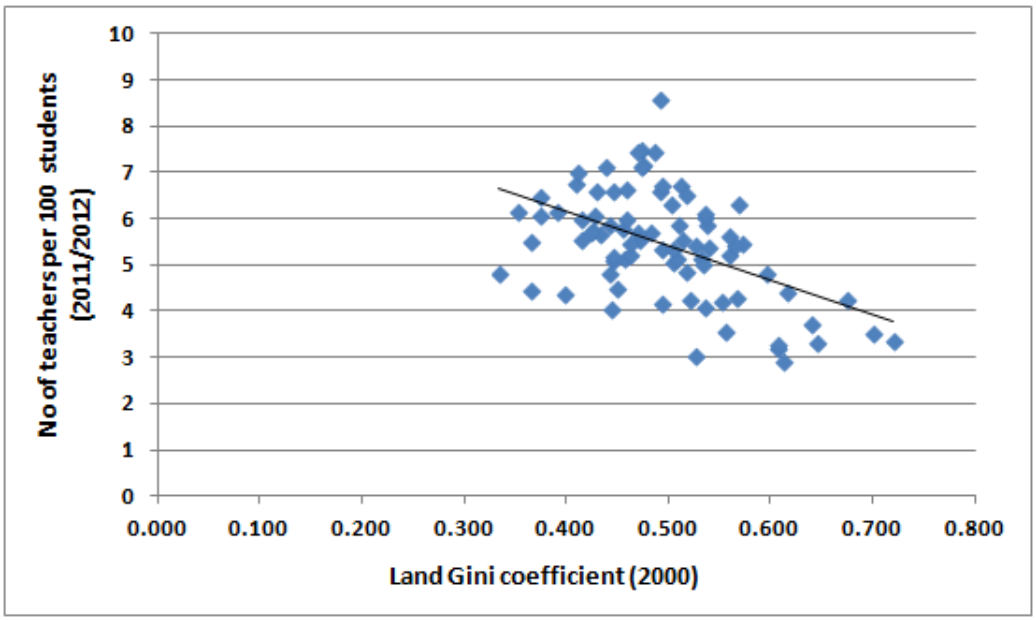
Sources: Penn World Table 7.1, Benaabdelaali, Hanchane and Kamal (2012)
Note: GDP per capita values are filtered using the Hodrick-Prescott filter. Educational Gini coefficients measure inequalities in years of schooling.

Figure 3.5. Number of teachers in primary education per 100 students and land inequality in Turkey's 81 provinces



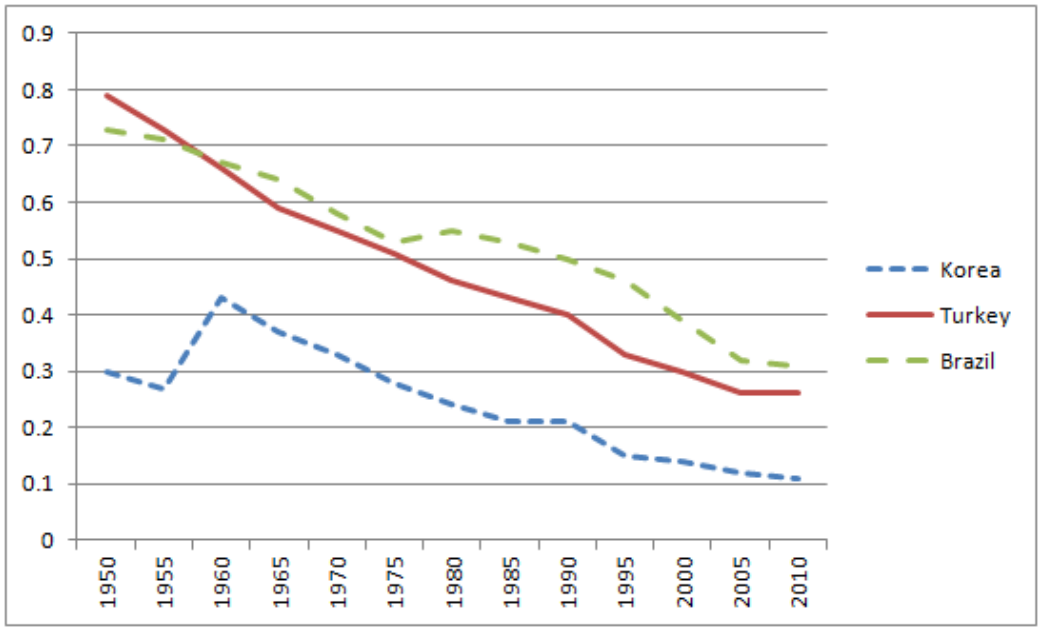
Source: Turkstat (2013)
Note: Land Gini coefficients are the author's calculations based on land size data from Turkstat (2013). The first eight years of education are classified as primary education.

Figure 3.6. Number of teachers in secondary education per 100 students and land inequality in Turkey's 81 provinces



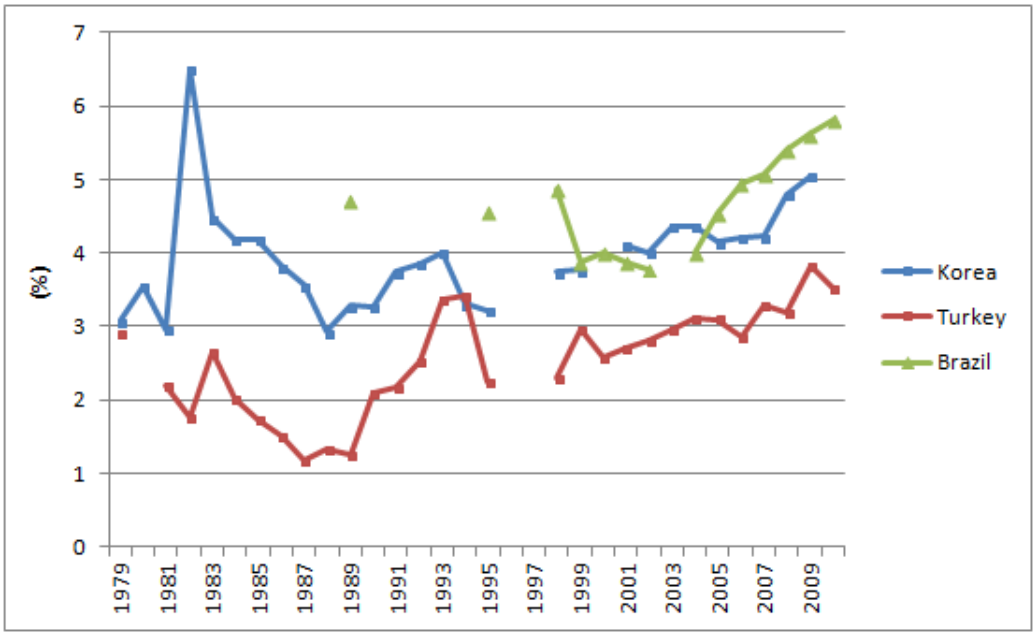
Source: Turkstat (2013)
Note: Land Gini coefficients are the author's calculations based on land size data from Turkstat (2013). Grades 9-12 are classified as secondary education.

Figure 3.7. Education Gini coefficients for male in Korea, Turkey and Brazil (1960-2010)



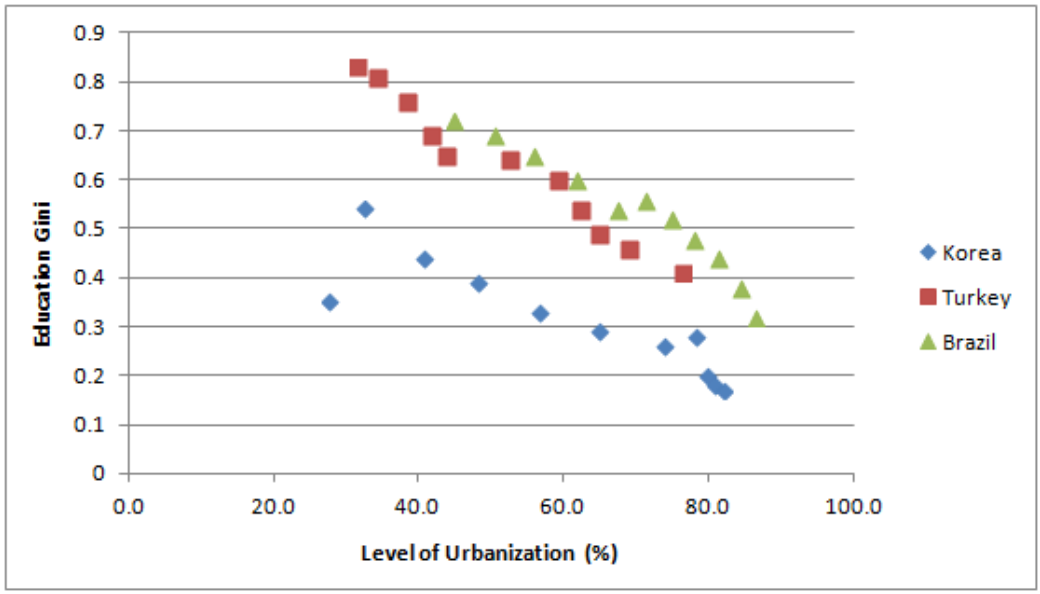
Source: Benaabdelaali, Hanchane and Kamal (2012)
Note: Education Gini coefficients measure inequalities in years of schooling.

Figure 3.8. Public Education Expenditures/GDP (%) in Korea, Turkey and Brazil (1979-2010)



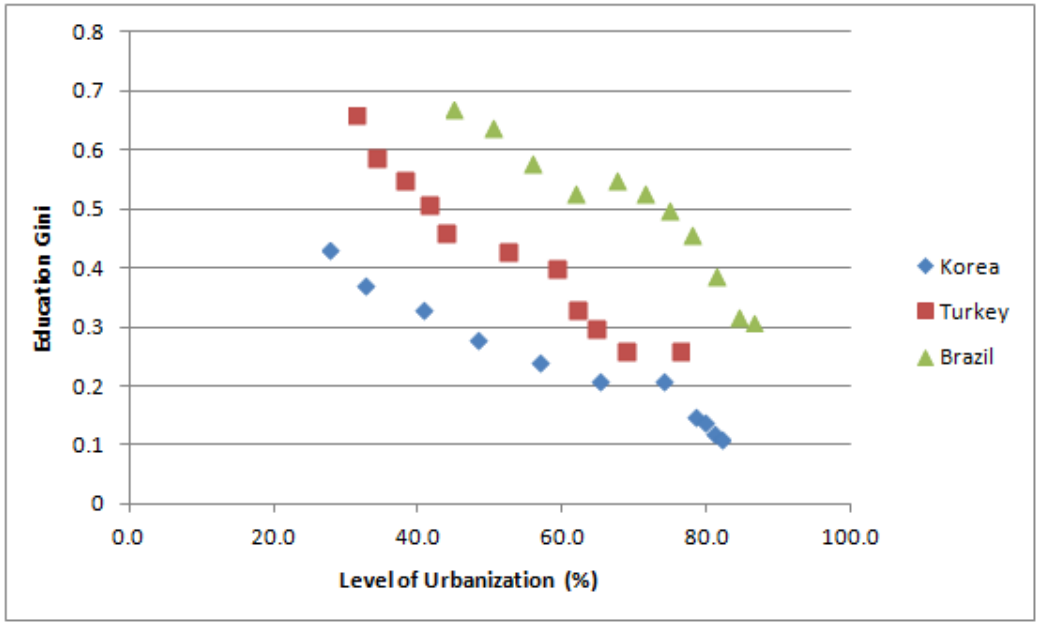
Sources: World Development Indicators (2013); Turkey's 2008-2010 data come from the author's calculations based on Bumko (2013) and Turkstat (2013)

Figure 3.9. Levels of urbanization and education Gini coefficients in Korea, Turkey and Brazil (1960-2010)



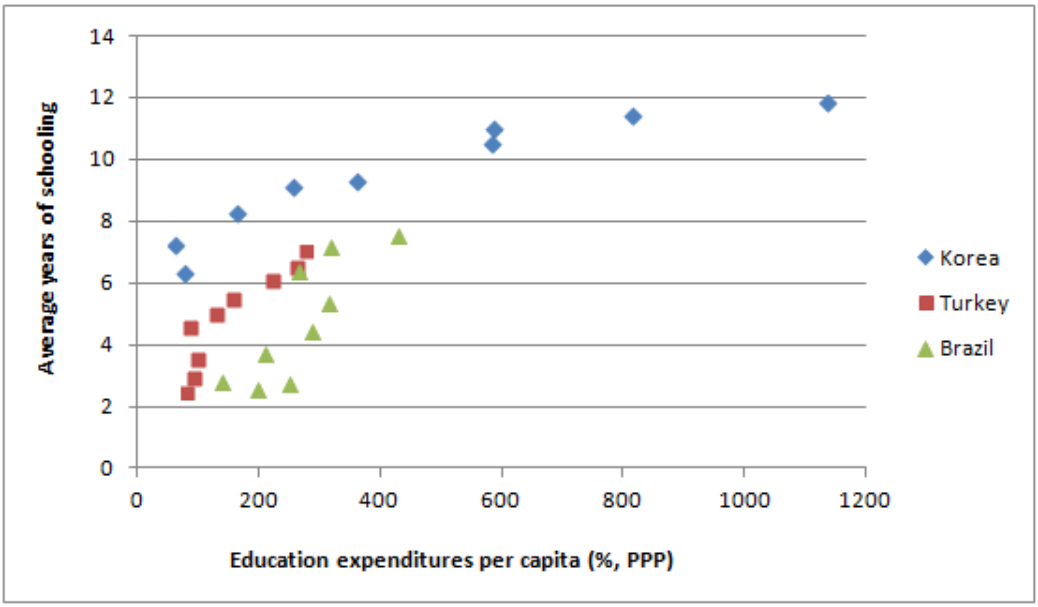
Sources: World Development Indicators (2013), Benaabdelaali, Hanchane and Kamal (2012)
Note: Urban population refers to individuals living in urban areas as defined by national statistical offices. Education Gini coefficients measure inequalities in years of schooling.

Figure 3.10. Levels of urbanization and education Gini coefficients in Korea, Turkey and Brazil (1960-2010, males only)



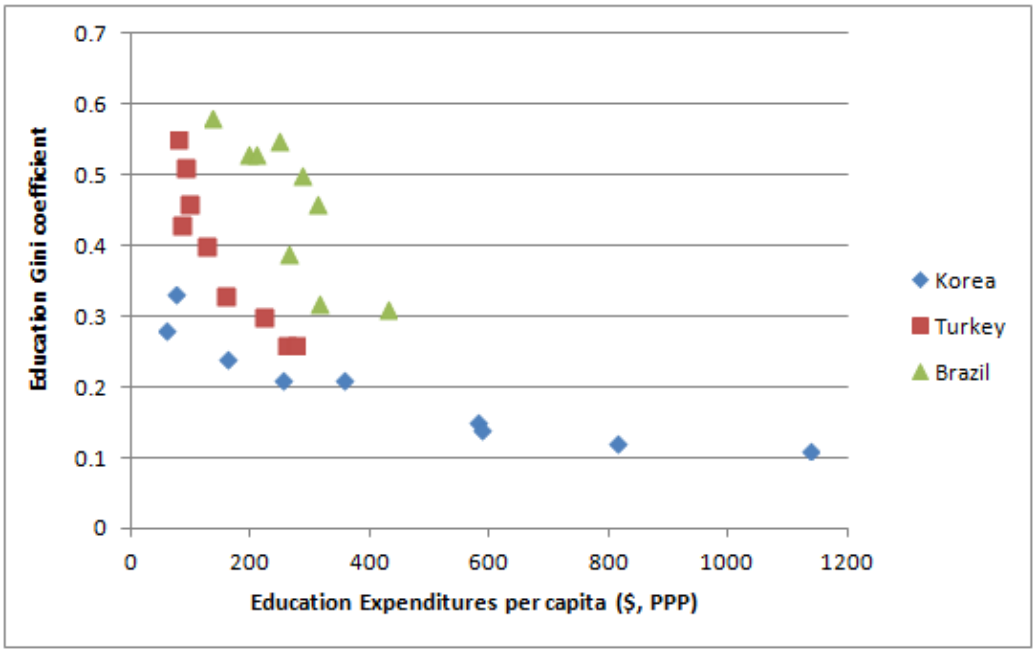
Sources: World Development Indicators (2013), Benaabdelaali, Hanchane and Kamal (2012)
Note: Urban population refers to individuals living in urban areas as defined by national statistical offices. Education Gini coefficients measure inequalities in years of schooling.

Figure 3.11. Education expenditures per capita and average years of schooling in Korea, Turkey and Brazil (1970-2010)



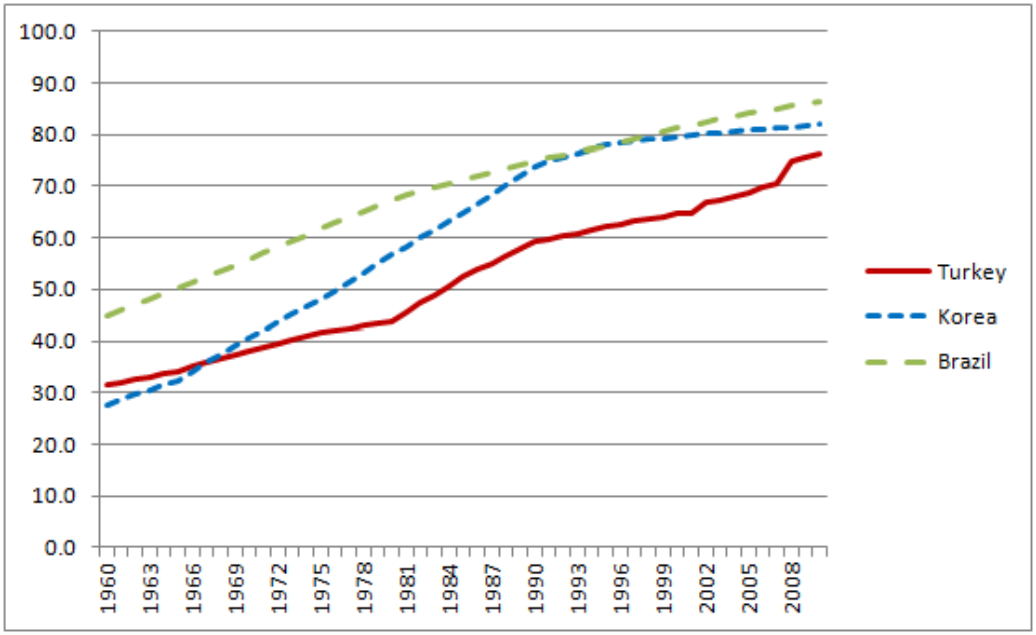
Sources: World Development Indicators (2013), Barro and Lee (2012), Penn World Table 7.1(2013)
Note: Education expenditures per capita are calculated as Education as a Share of GDP*GDP per capita ($, PPP)

Figure 3.12. Education expenditures per capita and education Gini coefficients in Korea, Turkey and Brazil (1970-2010, males only)



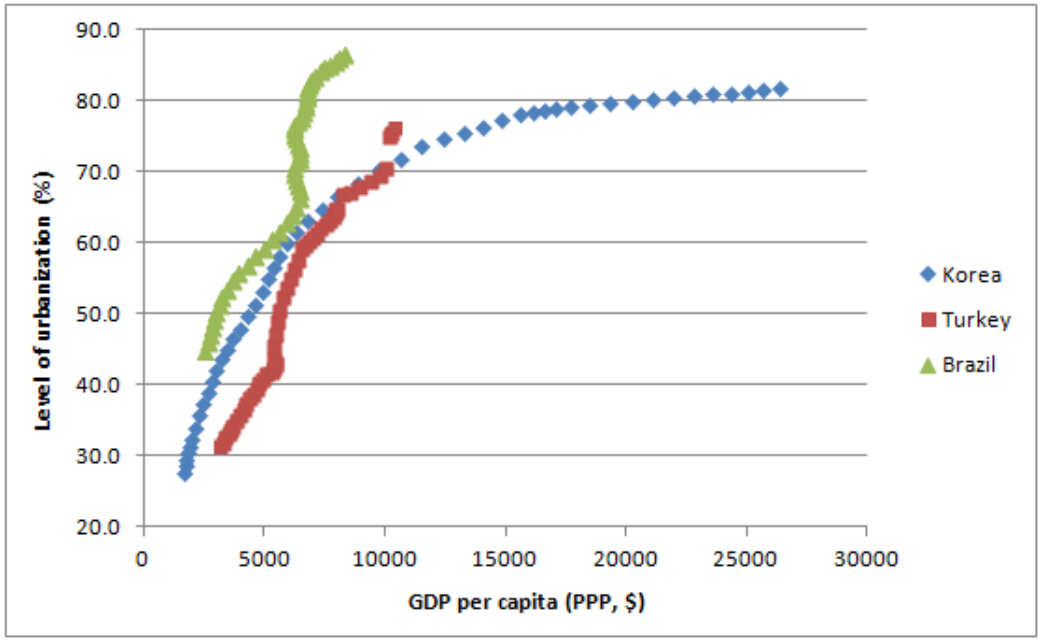
Sources: World Development Indicators (2013), Benaabdelaali, Hanchane and Kamal (2012), Penn World Table 7.1 (2013)
Note: Education expenditures per capita is calculated as Education Share of GDP*GDP per capita ($, PPP). Education Gini coefficients measure inequalities in years of schooling.

Figure 3.13. The level of urbanization (%) in Turkey, Korea and Brazil (1960-2010)



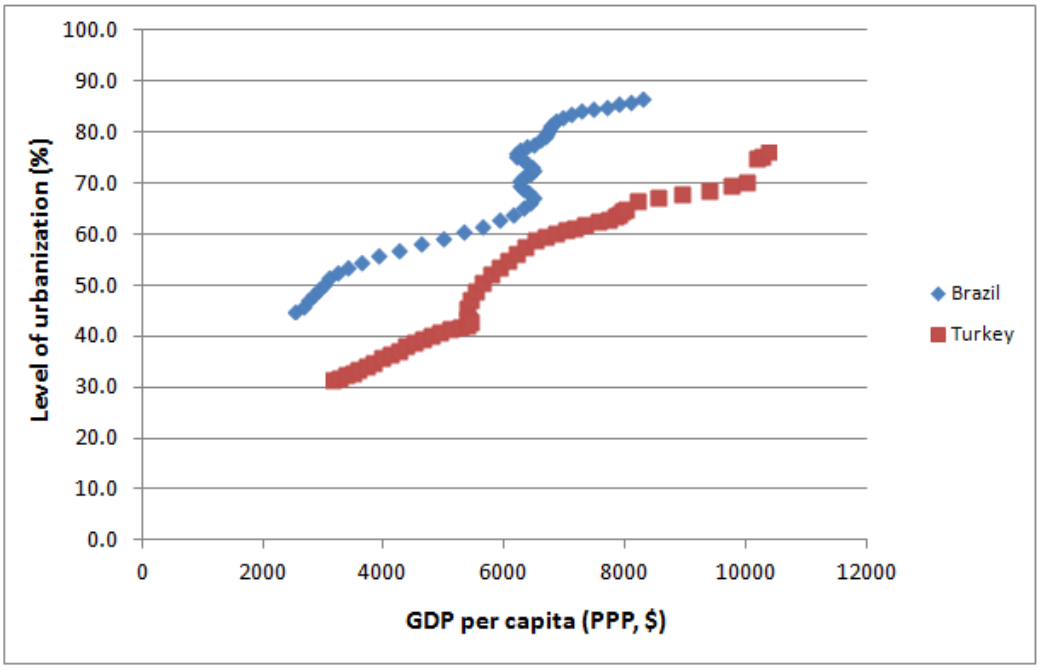
Sources: World Development Indicators (2013), Turkstat(2013)
Note: Urban population refers to individuals living in urban areas as defined by national statistical offices.

Figure 3.14. GDP per capita (PPP, $) and level of urbanization (%) in Turkey, Korea and Brazil (1960-2010)



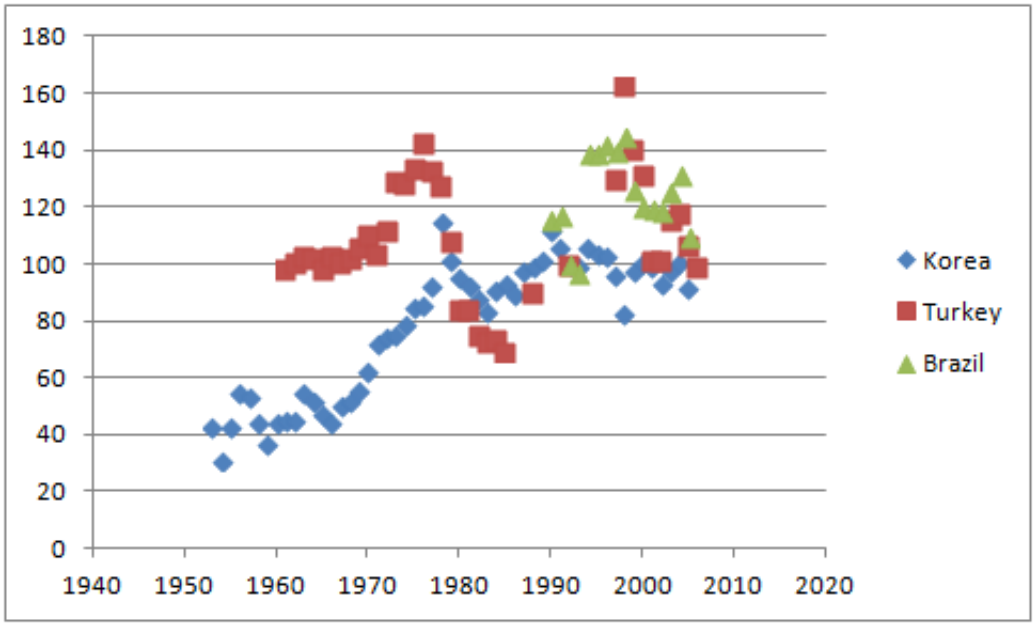
Sources: World Development Indicators (2013), Turkstat(2013), Penn World Table 7.1(2013)
Note: Urban population refers to individuals living in urban areas as defined by national statistical offices. GDP per capita values are filtered using the Hodrick-Prescott filter.

Figure 3.15. GDP per capita (PPP, $) and level of urbanization (%) in Turkey and Brazil (1960-2010)



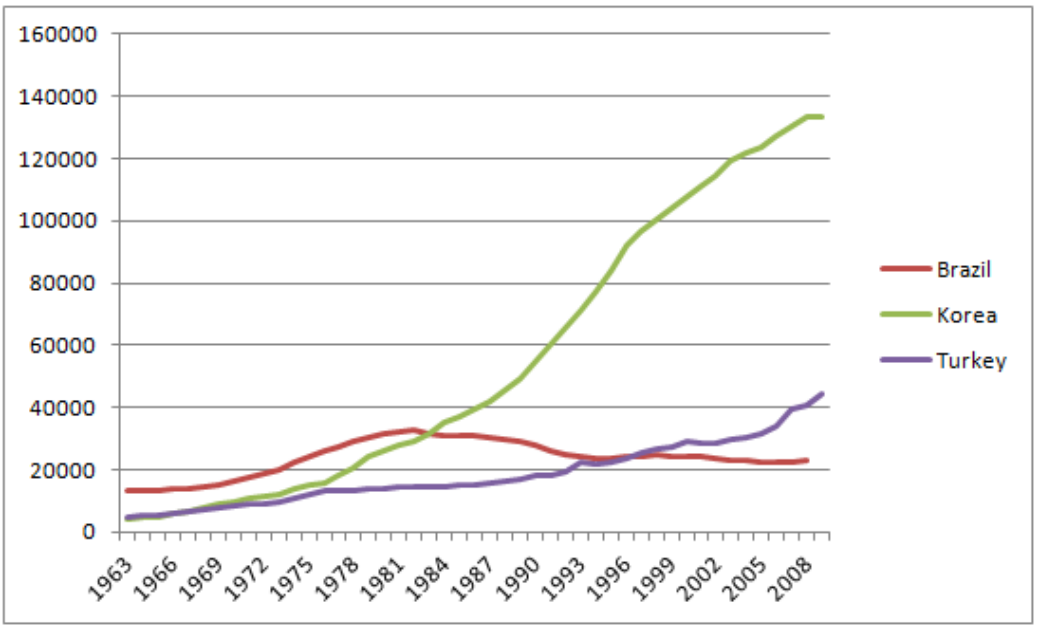
Sources: World Development Indicators (2013), Turkstat(2013), Penn World Table 7.1(2013)
Note: Urban population refers to people individuals living in urban areas as defined by national statistical offices. GDP per capita values are filtered by using the Hodrick-Prescott filter.

Figure 3.16. Ratio of prices between goods in the agriculture and manufacturing sectors (terms of trade) in Korea, Turkey and Brazil (1992=100)



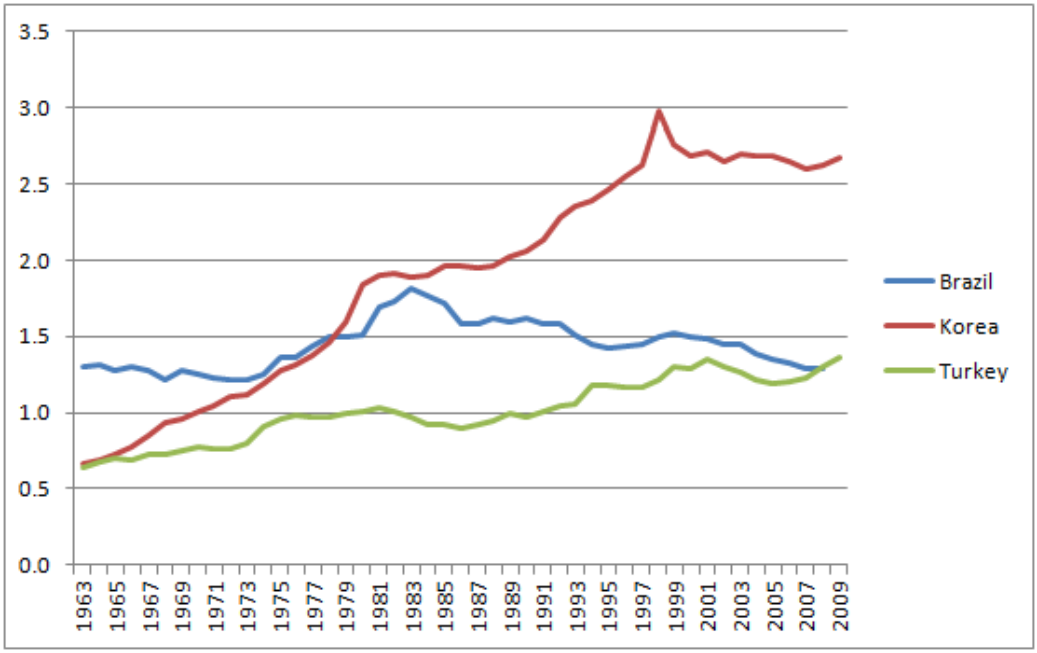
Sources: Groningen Growth and Development Center 10-Sector Database (2007), Boratav (1988, 2009)

Figure 3.17. Capital Stock/Labor ratio in Korea, Turkey and Brazil (1963-2010)



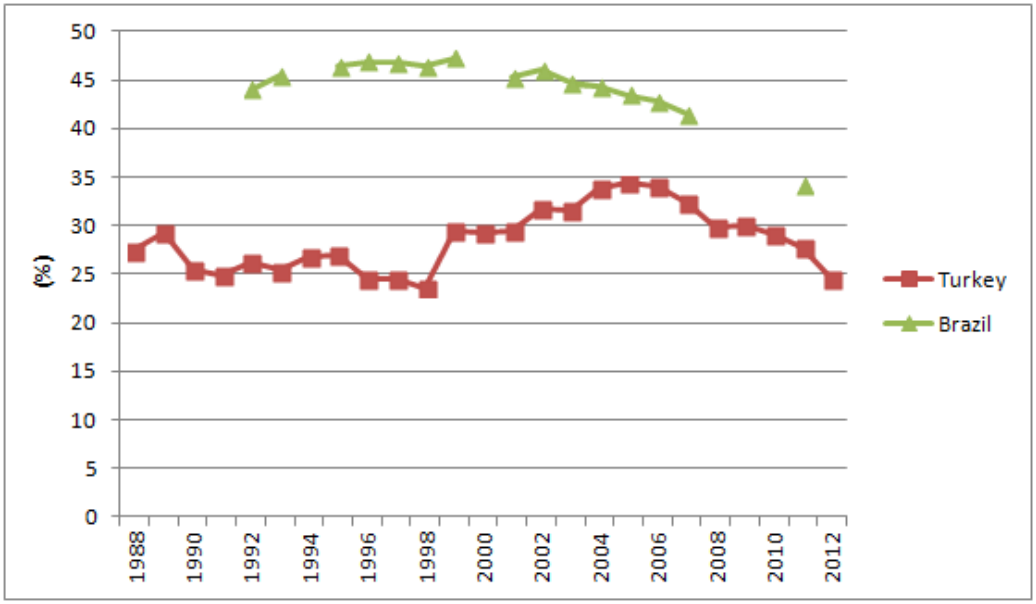
Source: Author's calculations based on the Extended Penn World Tables 4.0 (Marquetti and Foley, 2012)

Figure 3.18. Capital/Value added ratio in Korea, Turkey and Brazil (1963-2010)



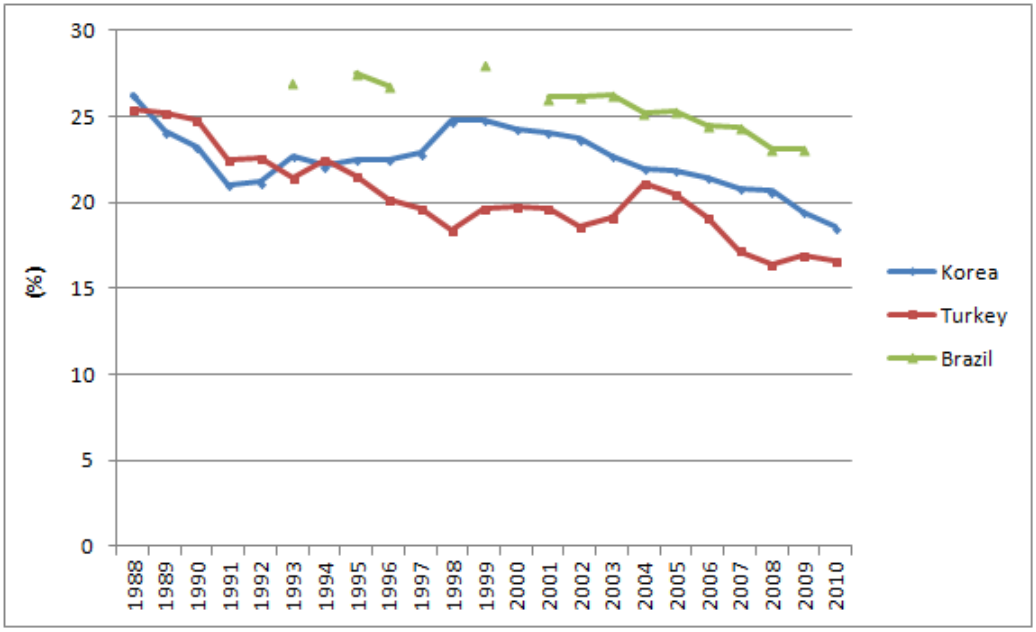
Source: Author's calculations based on the Extended Penn World Tables 4.0 (Marquetti and Foley, 2012)

Figure 3.19. Nonagricultural share of informal employment in Turkey and Brazil (1960-2012)



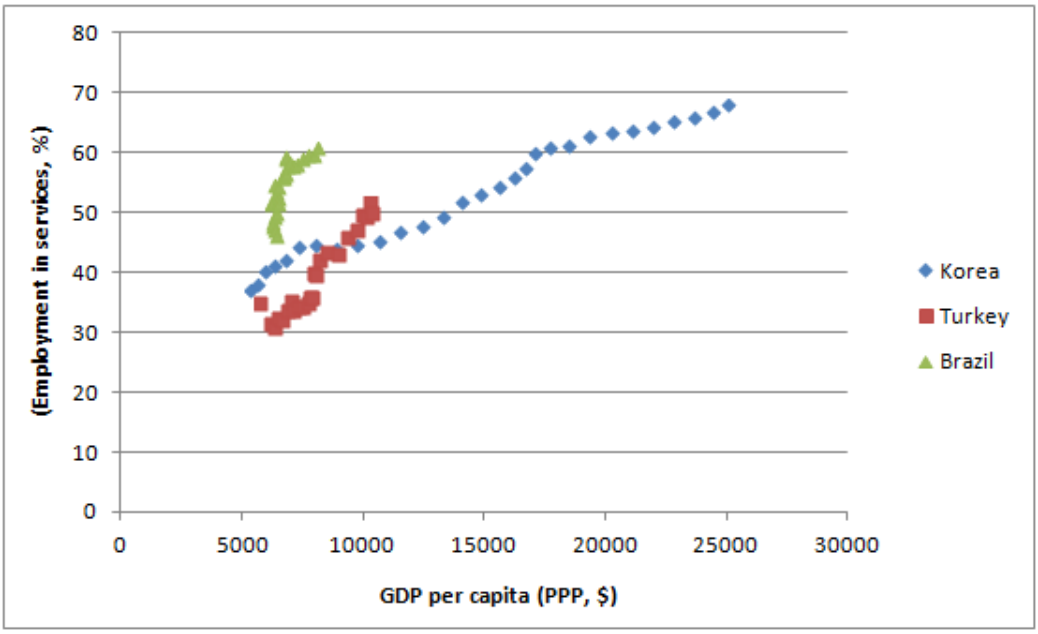
Sources: Author's calculations based on Turkstat (2013) and the Brazilian Institute of Geography and Statistics (2013)
Note: Informal employment is measured as the share of unregistered employment in total employment.

Figure 3.20. Nonagricultural share of vulnerable employment (self-employed+unpaid family workers) in Korea, Turkey and Brazil (1988-2010)



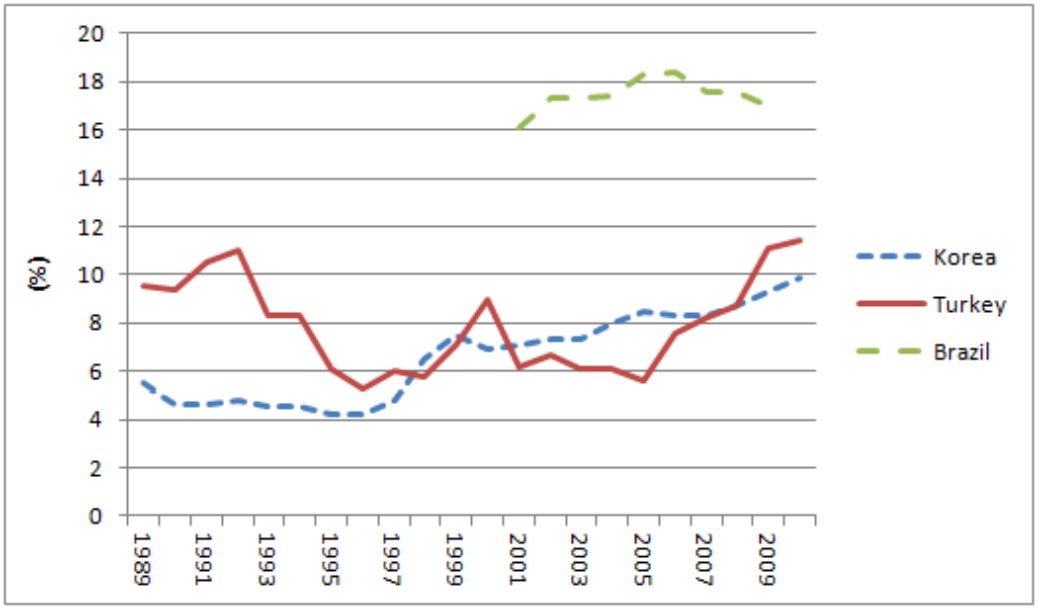
Sources: Author's calculators based on the Korea Statistical Information Service (2013), Turkstat (2013), Cepal (2013) and Heintz (2008)

Figure 3.21. The employment share of the services sector and GDP per capita ($, PPP) in Korea, Turkey and Brazil (1980-2010)



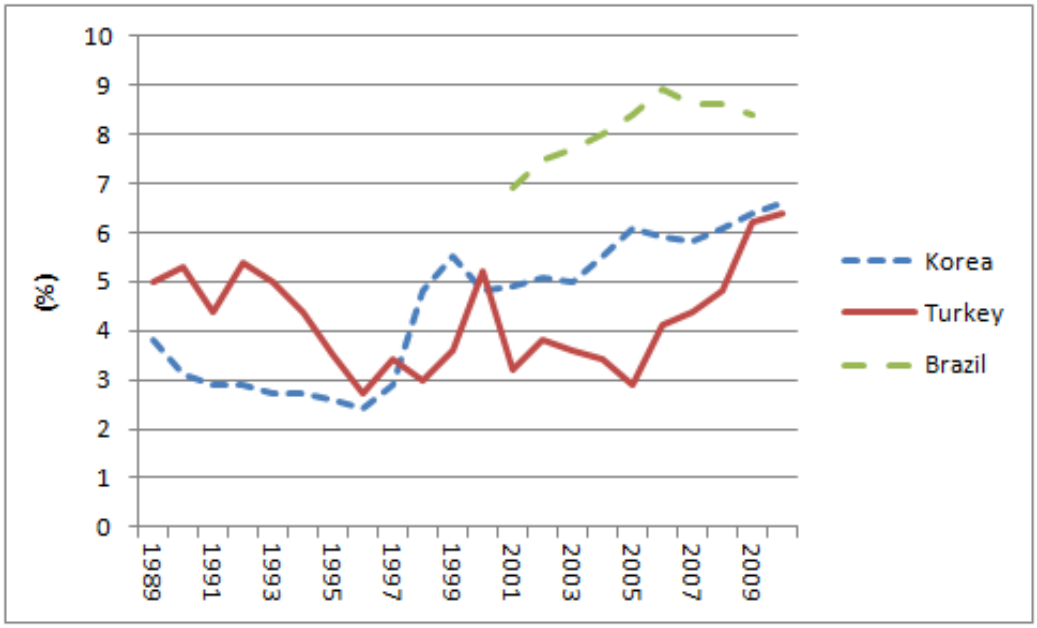
Sources: Penn World Table 7.1(2013), World Development Indicators (2013)

Figure 3.22. Part-time employment rate (%) for Korea, Turkey and Brazil (all individuals over age 15)



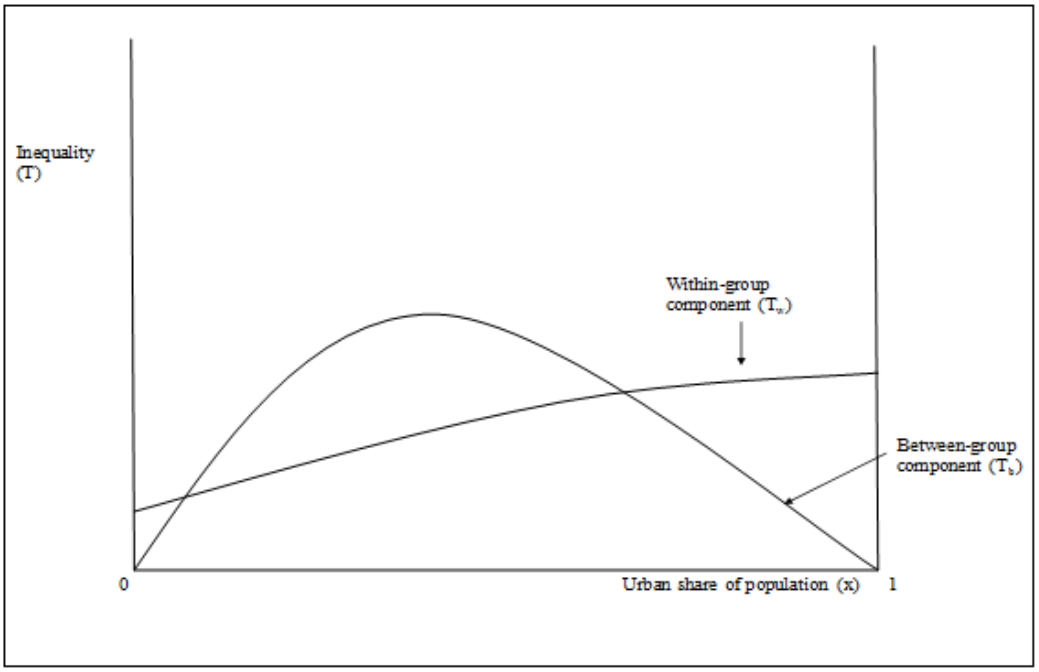
Source: ILO(2013)

Figure 3.23. Part-time employment rate (%) for Korea, Turkey and Brazil (males over age 24)



Source: ILO(2013)

Figure 4.1. Change in inequality in the Kuznets Process



Source: Anand and Kanbur (1993)

Figure 4.2. The impact of urban sector enrichment and enlargement on the overall income inequality

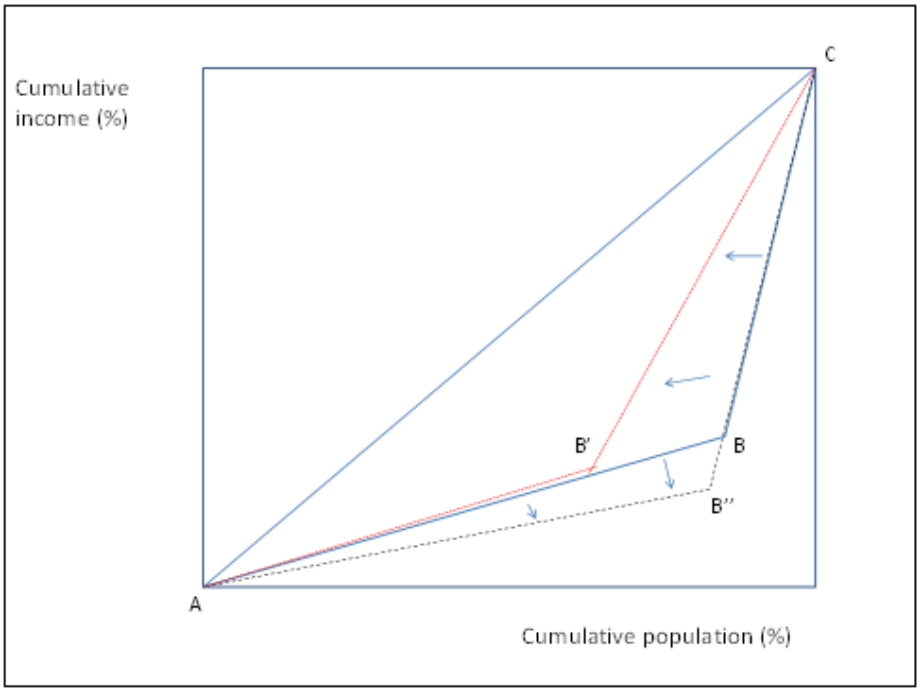
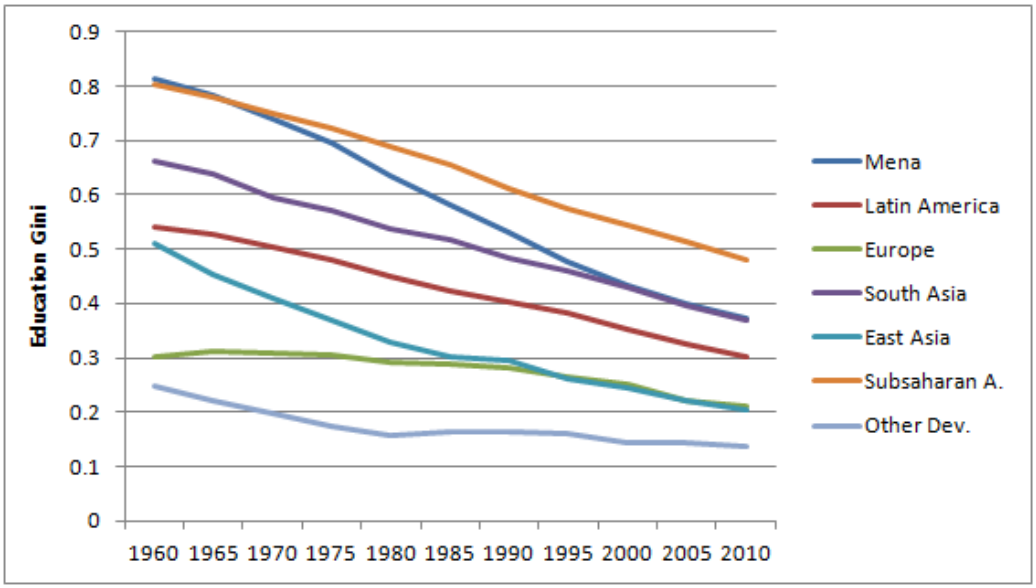


Figure 4.3. Average education Gini coefficients in different groups of countries (1960-2010)



Source: Benaabdelaali, Hanchane, and Kamal (2012)

APPENDIX A

THE DATASETS ON URBAN AND OVERALL INCOME/EXPENDITURE GINI COEFFICIENTS AND LAND GINI COEFFICIENTS

Table A.1. Urban income/expenditure Gini coefficients

	Year	Urban Gini	Source	E/I
Algeria	1995	0.350	UN-HABITAT(2010a)	0
Argentina	2010	0.449	PovcalNet(2012)	0
Austria				0
Australia				0
Bahrain				0
Bangladesh	2005	0.347	Khan (2005)	1
Belgium				0
Bolivia	2007	0.499	CEPAL(2011)	0
Botswana	2001/02	0.500	UN-HABITAT(2010a)	0
Brazil	2009	0.569	CEPAL(2011)	0
Cameroon	2001	0.406	IMF(2003)	0
Canada				0
Central African Republic	2003	0.420	UN-HABITAT(2010a)	1
Chad				0
Chile	2009	0.524	CEPAL(2011)	0
China	2008	0.355	PovcalNet(2012)	1
Colombia	2009	0.555	CEPAL(2011)	0
Congo, Dem. Rep.	2004/05	0.400	UN-HABITAT(2010a)	1
Congo, Rep.				0
Costa Rica	2009	0.494	CEPAL(2011)	0
Cote d'Ivoire	2008	0.440	UN-HABITAT(2010a)	1
Denmark				0
Dominican Republic	2009	0.585	CEPAL(2011)	0
Ecuador	2009	0.485	CEPAL(2011)	0
Egypt, Arab Rep.				0

Note: 1 stands for expenditure and 0 for income Gini coefficient.

Table A.1.(cont.) Urban income/expenditure Gini coefficients

	Year	Urban Gini	Source	E/I
El Salvador				0
Ethiopia	2004/05	0.440	UN-HABITAT(2010a)	1
Finland				0
France				0
Gabon				0
Germany				0
Ghana	1998	0.600	UN-HABITAT(2010b)	0
Greece				0
Guatemala	2006	0.547	CEPAL(2011)	0
Guinea-Bissau				0
Haiti	2000	0.574	Pedersen and Lockwood (2001)	1
Honduras	2009	0.469	CEPAL(2011)	0
India	2009/10	0.393	PovcalNet(2012)	1
Indonesia	2011	0.422	PovcalNet(2012)	1
Iran, Islamic Rep.	2004	0.4	Salehi-Isfahani(2009)	1
Iraq				0
Ireland				0
Israel				0
Italy				0
Jamaica				0
Japan				0
Jordan	1992	0.435	UNU-Wider(2008)	1
Kenya	2006	0.450	UN-HABITAT(2010a)	1
Korea, Rep.				0
Kuwait				0
Lebanon				0
Lesotho	1991	0.580	Eastwood and Lipton (2004)	0
Liberia				0
Madagascar				0
Malawi	1998	0.520	UN-HABITAT(2010a)	1
Malaysia	1999	0.420	UN-HABITAT(2010a)	0
Mali				0
Mexico	2008	0.487	CEPAL(2011)	0
Morocco	1998	0.380	UN-HABITAT(2010a)	1
Mozambique	2002/03	0.480	UN-HABITAT(2010a)	1
Nepal	2003/04	0.440	Sharma (2010)	0
Netherlands				0
New Zealand				0

Note: 1 stands for expenditure and 0 for income Gini coefficient.

Table A.1.(cont.) Urban income/expenditure Gini coefficients

	Year	Urban Gini	Source	E/I
Nicaragua	2005	0.500	CEPAL(2011)	0
Niger				0
Nigeria	2006	0.580	UN-HABITAT(2010a)	0
Norway				0
Pakistan	2004	0.340	UN-HABITAT(2010a)	1
Panama	2009	0.475	CEPAL(2011)	0
Paraguay	2007	0.480	UN-HABITAT(2010a)	0
Peru	2009	0.422	CEPAL(2011)	0
Philippines	2003	0.450	UN-HABITAT(2010a)	0
Poland	2008	0.300	Brzezinski and Kostro (2010)	0
Portugal				0
Puerto Rico				0
Saudi Arabia				0
Senegal	2001/02	0.380	UN-HABITAT(2010b)	1
Sierra Leone	2002	0.390	UN-HABITAT(2010b)	1
South Africa	2008	0.670	Leibbrandt et. al.(2010)	0
Spain				0
Sri Lanka	2006/07	0.550	UN-HABITAT(2010a)	0
Sudan				0
Swaziland				0
Sweden				0
Switzerland				0
Syrian Arab Republic				0
Tanzania	1993	0.420	Eastwood and Lipton (2004)	1
Thailand	1986	0.460	Eastwood and Lipton (2004)	0
Togo	2006	0.310	UN-HABITAT(2010a)	1
Trinidad and Tobago	1992	0.514	UNU-Wider(2008)	0
Tunisia	2000	0.391	Lahouel (2007)	0
Turkey	2010	0.389	Turkstat (2011)	0
Uganda	2005/06	0.430	UN-HABITAT(2010a)	0
United Kingdom				0
United States				0
Uruguay	2009	0.433	CEPAL(2011)	0
Venezuela, RB	1997	0.496	UNU-Wider(2008)	0
Vietnam	2002	0.420	UN-HABITAT(2010a)	0
Zambia	2006	0.660	UN-HABITAT(2010a)	0

Note: 1 stands for expenditure and 0 for income Gini coefficient.

Table A.2. Overall income/expenditure Gini coefficients

	Year	Overall Gini	Source	E/I
Algeria	1995	0.353	PovcalNet(2012)	1
Argentina	2010	0.449	PovcalNet(2012)	0
Austria	2010	0.261	Eurostat(2012)	0
Australia	2008	0.336	OECD(2011)	0
Bahrain	2006	0.390	Bahrain EDB(2011)	0
Bangladesh	2010	0.321	PovcalNet(2012)	1
Belgium	2010	0.266	Eurostat(2012)	0
Bolivia	2007	0.565	CEPAL(2011)	0
Botswana	2006	0.600	Martin(2009)	0
Brazil	2009	0.576	CEPAL(2011)	0
Cameroon	2007	0.389	PovcalNet(2012)	1
Canada	2008	0.328	OECD(2011)	0
Central African Republic	2008	0.563	PovcalNet(2012)	1
Chad	2005	0.350	World Bank(2008)	0
Chile	2009	0.524	CEPAL(2011)	0
China	2006	0.434	Asian Development Bank (2012)	1
Colombia	2010	0.578	CEPAL(2011)	0
Congo, Dem. Rep.	2005/06	0.444	PovcalNet(2012)	1
Congo, Rep.	2005	0.473	PovcalNet(2012)	1
Costa Rica	2010	0.492	CEPAL(2011)	0
Cote d'Ivoire	2008	0.415	PovcalNet(2012)	1
Denmark	2010	0.269	Eurostat(2012)	0
Dominican Republic	2010	0.554	CEPAL(2011)	0
Ecuador	2010	0.495	CEPAL(2011)	0
Egypt, Arab Rep.	2008	0.307	PovcalNet(2012)	1
El Salvador	2010	0.454	CEPAL(2011)	0
Ethiopia	2005	0.295	World Bank(2011)	0
Finland	2010	0.254	Eurostat(2012)	0
France	2011	0.299	Eurostat(2012)	0
Gabon	2005	0.415	PovcalNet(2012)	1
Germany	2010	0.293	Eurostat(2012)	0
Ghana	2005/06	0.428	PovcalNet(2012)	1
Greece	2010	0.329	Eurostat(2012)	0
Guatemala	2006	0.585	CEPAL(2011)	0
Guinea-Bissau	2002	0.355	PovcalNet(2012)	1
Haiti	2001	0.592	PovcalNet(2012)	0
Honduras	2010	0.567	CEPAL(2011)	0

Note: 1 stands for expenditure and 0 for income Gini coefficient.

Table A.2. Overall income/expenditure Gini coefficients (cont.)

	Year	Overall Gini	Source	E/I
India	2010	0.370	Asian Development Bank (2012)	1
Indonesia	2011	0.389	Asian Development Bank (2012)	1
Iran, Islamic Rep.	2005	0.383	PovcalNet(2012)	1
Iraq	2006	0.309	PovcalNet(2012)	1
Ireland	2010	0.332	Eurostat(2012)	0
Israel	2001	0.372	UNU-Wider(2008)	0
Italy	2010	0.312	Eurostat(2012)	0
Jamaica	2004	0.455	UNU-Wider(2008)	1
Japan	2006	0.329	OECD(2011)	0
Jordan	2010	0.354	PovcalNet(2012)	1
Kenya	2005	0.477	PovcalNet(2012)	1
Korea, Rep.	2010	0.310	Kim (2011)	0
Kuwait	1999	0.360	Ali (2003)	1
Lebanon	2004	0.360	Bibi and Nabli (2010)	1
Lesotho	2002	0.520	PovcalNet(2012)	1
Liberia	2007	0.382	PovcalNet(2012)	1
Madagascar	2010	0.441	PovcalNet(2012)	1
Malawi	2004	0.390	PovcalNet(2012)	1
Malaysia	2009	0.462	PovcalNet(2012)	0
Mali	2010	0.330	PovcalNet(2012)	1
Mexico	2010	0.481	CEPAL(2011)	0
Morocco	2007	0.409	PovcalNet(2012)	1
Mozambique	2007	0.457	PovcalNet(2012)	1
Nepal	2010	0.328	PovcalNet(2012)	1
Netherlands	2010	0.255	Eurostat(2012)	0
New Zealand	2001	0.335	UNU-Wider (2008)	0
Nicaragua	2005	0.532	CEPAL(2011)	0
Niger	2007	0.335	PovcalNet(2012)	1
Nigeria	2009	0.488	PovcalNet(2012)	1
Norway	2010	0.236	Eurostat(2012)	0
Pakistan	2007	0.300	PovcalNet(2012)	1
Panama	2010	0.519	CEPAL(2011)	0
Paraguay	2010	0.533	CEPAL(2011)	0
Peru	2010	0.458	CEPAL(2011)	0

Note: 1 stands for expenditure and 0 for income Gini coefficient.

Table A.2. Overall income/expenditure Gini coefficients (cont.)

	Year	Overall Gini	Source	E/I
Philippines	2009	0.430	PovcalNet(2012)	1
Poland	2010	0.311	Eurostat(2012)	0
Portugal	2010	0.337	Eurostat(2012)	0
Puerto Rico	2003	0.529	UNU-Wider(2008)	0
Saudi Arabia	2006	0.397	World Bank(2011)	0
Senegal	2005	0.392	PovcalNet(2012)	1
Sierra Leone	2003	0.425	PovcalNet(2012)	1
South Africa	2008	0.700	Leibbrandt et. al.(2010)	0
Spain	2010	0.339	Eurostat(2012)	0
Sri Lanka	2006	0.403	PovcalNet(2012)	1
Sudan	2009	0.353	PovcalNet(2012)	1
Swaziland	2009	0.515	PovcalNet(2012)	1
Sweden	2010	0.241	Eurostat(2012)	0
Switzerland	2010	0.295	Eurostat(2012)	0
Syrian Arab Republic	2004	0.374	PovcalNet(2012)	1
Tanzania	2007	0.376	PovcalNet(2012)	1
Thailand	2009	0.400	PovcalNet(2012)	1
Togo	2006	0.344	PovcalNet(2012)	0
Trinidad and Tobago	1992	0.403	PovcalNet(2012)	0
Tunisia	2005	0.414	PovcalNet(2012)	1
Turkey	2010	0.402	Turkstat (2011)	0
Uganda	2009	0.443	WB(2011)	0
United Kingdom	2010	0.330	Eurostat(2012)	0
United States	2008	0.378	OECD(2011)	0
Uruguay	2010	0.422	CEPAL(2011)	0
Venezuela, RB	2010	0.394	CEPAL(2011)	0
Vietnam	2008	0.354	PovcalNet(2012)	1
Zambia	2006	0.546	PovcalNet(2012)	1

Note: 1 stands for expenditure and 0 for income Gini coefficient.

Table A.3. Land Gini Coefficients

	Year	Land Gini	Source
Algeria	1973	0.650	Muller and Seligson(1987)
Argentina	1960	0.740	Frankema (2010)
Austria	1960	0.671	Frankema (2010)
Australia	1960	0.820	Frankema (2010)
Bahrain	1970	0.521	Taylor and Jodice(1983)
Bangladesh	1961	0.418	Frankema (2010)
Belgium	1959	0.600	Frankema (2010)
Bolivia	1960	0.768	Frankema (2010)
Botswana	1969	0.459	Frankema (2010)
Brazil	1960	0.835	Deininger and Squire (1998)
Cameroon	1972	0.407	Frankema (2010)
Canada	1961	0.526	Frankema (2010)
Central African Republic	1974	0.336	Frankema (2010)
Chad	1973	0.340	Muller and Selingson(1987)
Chile	1965	0.865	Frankema (2010)
China	1960/61	0.474	Berry and Cline(1979)
Colombia	1960	0.860	Deininger and Squire (1998)
Congo, Dem. Rep.	1970	0.592	Deininger and Squire (1998)
Congo, Rep.	1973	0.270	Muller and Seligson(1987)
Costa Rica	1963	0.739	Frankema (2010)
Cote d'Ivoire	1974	0.415	Frankema (2010)
Denmark	1959	0.442	Frankema (2010)
Dominican Republic	1960	0.745	Frankema (2010)
Ecuador	1954	0.804	Frankema (2010)
Egypt, Arab Rep.	1961	0.633	Frankema (2010)
El Salvador	1960	0.783	Frankema (2010)
Ethiopia	1977	0.424	Frankema (2010)
Finland	1959	0.338	Frankema (2010)
France	1963	0.502	Frankema (2010)
Gabon	1975	0.410	Muller and Seligson(1987)
Germany	1960 (FRG)	0.524	Frankema (2010)
Ghana	1970	0.530	Frankema (2010)
Greece	1961	0.597	Berry and Cline(1979)
Guatemala	1964	0.770	Frankema (2010)
Guinea-Bissau	1960/61	0.397	Author's calculations
Haiti	1971	0.462	Frankema (2010)

Note: Author's calculations are based on data in Lott(1979)

Table A.3. Land Gini Coefficients (cont.)

	Year	Land Gini	Source
Honduras	1952	0.706	Frankema (2010)
India	1960	0.583	Deininger and Squire (1998)
Indonesia	1963	0.527	Frankema (2010)
Iran, Islamic Rep.	1960	0.623	Frankema (2010)
Iraq	1958	0.820	Frankema (2010)
Ireland	1960	0.575	Frankema (2010)
Israel	1970	0.698	Frankema (2010)
Italy	1960	0.620	Frankema (2010)
Jamaica	1961	0.757	Frankema (2010)
Japan	1960	0.411	Deininger and Squire (1998)
Jordan	1983	0.643	Frankema (2010)
Kenya	1960	0.762	Frankema (2010)
Korea, Rep.	1961	0.354	IFAD(2001)
Kuwait	1970	0.725	Frankema (2010)
Lebanon	1970	0.770	Muller and Selingson(1987)
Lesotho	1960	0.381	Frankema (2010)
Liberia	1971	0.681	Frankema (2010)
Madagascar	1961	0.804	Frankema (2010)
Malawi	1969	0.340	Muller and Selingson(1987)
Malaysia	1960	0.680	Frankema (2010)
Mali	1960	0.451	Frankema (2010)
Mexico	1960	0.607	Frankema (2010)
Morocco	1962	0.577	Frankema (2010)
Mozambique	1970	0.705	Author's calculations
Nepal	1961	0.570	El-Ghonemy(1990)
Netherlands	1959	0.557	Frankema (2010)
New Zealand	1960	0.696	Frankema (2010)
Nicaragua	1963	0.759	Frankema (2010)
Niger	1960	0.468	Author's calculations
Nigeria	1973	0.370	Griffin Khan Ickowitz(2002)
Norway	1959	0.362	Frankema (2010)
Pakistan	1960	0.596	Deininger and Squire (1998)
Panama	1960	0.699	Frankema (2010)
Paraguay	1961	0.863	Frankema (2010)
Peru	1961	0.854	Frankema (2010)
Philippines	1960	0.508	Deininger and Squire (1998)
Poland	1960	0.511	Frankema (2010)

Note: Author's calculations are based on data in Lott(1979)

Table A.3. Land Gini Coefficients (cont.)

	Year	Land Gini	Source
Portugal	1968	0.756	Frankema (2010)
Puerto Rico	1959	0.707	Frankema (2010)
Saudi Arabia	1974	0.780	Muller and Selingson(1987)
Senegal	1960	0.467	Frankema (2010)
Sierra Leone	1970	0.436	Frankema (2010)
South Africa	1960	0.643	Frankema (2010)
Spain	1960	0.791	Frankema (2010)
Sri Lanka	1961	0.627	Frankema (2010)
Sudan	1965	0.577	Deininger and Squire (1998)
Swaziland	1971	0.835	Frankema (2010)
Sweden	1961	0.488	Frankema (2010)
Switzerland	1969	0.504	Frankema (2010)
Syrian Arab Republic	1971	0.643	Frankema (2010)
Tanzania	1960	0.790	Frankema (2010)
Thailand	1963	0.444	Frankema (2010)
Togo	1961	0.452	Frankema (2010)
Trinidad and Tobago	1963	0.691	Frankema (2010)
Tunisia	1961	0.616	Frankema (2010)
Turkey	1960	0.608	Frankema (2010)
Uganda	1963	0.481	Frankema (2010)
United Kingdom	1960	0.687	Frankema (2010)
United States	1959	0.677	Frankema (2010)
Uruguay	1960	0.791	Frankema (2010)
Venezuela, RB	1961	0.924	Deininger and Squire (1998)
Vietnam	1960	0.562	Frankema (2010)
Zambia	1971	0.699	Frankema (2010)

Note: Author's calculations are based on data in Lott(1979)

APPENDIX B

CALCULATING HUMAN DEVELOPMENT INDEX

HDIs are calculated using the methodology explained in the Human Development Report - 2010 (2011). The HDI's in the HDR were calculated based on life expectancy, expected and mean years of schooling, and the GNP per capita. The calculations are based on UNDESA (2011), Barro and Lee (2011) and the Penn World Tables 7.1 (2013) databases. First, separate dimension indices are formed for education, life expectancy and GDP per capita using the estimated and assumed minimum and maximum values of variables. The dimension indices are estimated using the following formula:

$$dimension\,index = \frac{actual\,value - minimum\,value}{maximum\,value - minimum\,value} \tag{B.1}$$

Following the HDR's methodology, I used the logarithms of GDP per capita to estimate the GDP index. The maximum and minimum values were the lowest and highest values between 1960-2010. I relied on UNDESA (2011), Barro and Lee (2011) and Penn World Tables 7.1 (2013) databases for the minimum values. Following the HDR, the minimum values for life expectancy and the expected and mean years of schooling were assumed to be 20, 0, 0, respectively. The minimum and maximum values are reported in Table B.1.

Two separate indices were estimated for the mean years of schooling and expected years of schooling. The geometrical mean of these two indices gives the combined education index. The combined education index over the observed maximum combined education index (0.951) is the education index. Using the geometrical mean of life expectancy, education and GDP per capita indices, I generated the Human Development Index for each year and country:

$$HDI = L_{Life}^{1/3} + L_{Income}^{1/3} + L_{Education}^{1/3} \tag{B.2}$$

The HDI values that I estimated are different from the HDI values that UNDP estimated in each HDR, as the maximum and minimum values used might change every year. The HDR report classifies the countries with HDI above 0.800 as being at the "very high human development" level. These countries are classified as "developed" in this paper. The number of countries that are classified as "developed" and "developing" in the years 1985, 1995, and 2005 are shown in Table B.2.

Table B.1. The minimum and maximum values of variables

Dimension	Observed Maximum	Minimum
Life expectancy	85.6 (Israel, 2006)	20
Mean years of schooling	13.3 (United States, 2010)	0
Expected years of schooling	20.8 (Australia, 2002)	0
Combined education index	0.951 (New Zealand, 2010)	0
Per capita income (PPP, $)	52502 (Kuwait, 2008)	161 (Liberia, 1995)

Table B.2. Number of countries classified as developing and developed for each year

	Developing	Developed
1985	96	10
1995	84	22
2005	83	23

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