
Abstract

We examine the drivers of inequality change in Honduras between 1991 and 2007, trying to understand why inequality increased in Honduras until 2005, while it was falling in most other Latin American countries. Using annual household surveys, we document first rising inequality between 1991 and 2005, which is followed by falling inequality thereafter. Using an inequality decomposition technique, we show that the rising inequality between 1991 and 2005 was, for the most part, driven by the dispersion of labour incomes in rural areas. We also show that the extraordinary labour earnings disequalization is mainly the result of a widening wage gap between the tradable and non-tradable sectors and occupations, combined with highly segmented labour markets and poor overall educational progress. The underlying determinants of the divergence between tradable and non-tradable sectors were highly overvalued currencies and poor commodity process for Honduras' agricultural exports. Between 2005 and 2007, however, the inequality reduction was a result of equalizing trends in labour and non-labour income. The commodity boom promoting the tradable sector and remittances (in this order) played a significant role here, with government transfers playing a small supporting role. Since the decline in inequality is largely driven by international factors, we cannot be sure whether the decline in inequality will continue.

Based on a joint work with Stephan Klasen and Thomas Otter. This study is the base of our chapter contributing to the textbook edited by Prof. Andrea Cornia "Falling Inequality in Latin America. Policy Changes and Lessons", published by Oxford University Press.
1.1 Introduction

Honduras stands out in Latin America as one of the few examples where inequality has not declined in the early 2000s, as in most other Latin American countries. As we show below, inequality has been rising, more or less continuously between 1991 and 2005. After 2005, inequality has started to fall, apparently extending beyond the last data point in our analysis, 2007. Honduras has thus been an outlier where the peak in inequality occurred much later and the decline thereafter is also much more tentative. The macro and micro causes of this exceptionalism are the main topic of this paper.

Despite considerable economic growth before the global economic downturn started in 2008, the World Bank (2006a) portrays Honduras as one of the poorest countries in Latin America with more than 50% of its population below the poverty line. Moreover, the country has one of the highest rates of inequality in Latin America. Poverty and inequality, in particular, have been aggravated by natural disasters (such as Hurricane Mitch in 1998) since the poor commonly live off small-scale agriculture in rural areas. After the disaster of Hurricane Mitch, Honduras designed a Poverty Reduction Strategy, seeking to reduce extreme poverty by half by 2015 (World Bank, 2006b), and its implementation since 2006 has been supported by debt relief from donors through the HIPC Initiative. These actions, together with external market conditions, have allowed Honduras to experience a positive economic growth during the last 15 years, averaging 3% annually.

Honduras is a small open economy relying heavily on a narrow range of exports, mainly bananas and coffee, making it highly vulnerable to natural disasters and shifts in commodity prices. In particular, Hurricane Mitch largely wiped out the banana production in 1998 and 1999, from which Honduras recovered very slowly thereafter, and was greatly affected by falling coffee prices until about 2002 and rising prices for both commodities thereafter (see Figure A.1 in

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3 2007 is the most recent year for which reliable household survey data are available (Encuesta Permanente de Hogares: EPHPM I from 1991-99 and II from 2001-07.) We always use the October wave of the survey. Since 2008, only the May wave has been available. These show that the decline in inequality has apparently continued beyond 2007 (EPHPM 2008, 2009 and 2010).

4 ECLAC (1999) states “Hurricane Mitch is the most serious hydro-meteorological disaster to have struck Central America in many years. Its force upon reaching the coasts of the region was exceptional, as were its diameter, the amount of moisture and rain it carried and the erratic path it followed for several days”. Moreover, Mitch caused around 14,000 direct deaths and an estimated material loss of around US$3.8 billion.

5 EPHPM 2007 shows that 85% and 64% of individuals of the first and second quintiles, respectively, are living in rural areas.
the Appendix). However, investments in the “maquila” (U.S. factories operated in Honduras under preferential tariff programs) and non-traditional export sectors are slowly diversifying the production of the Honduran economy. These attempts at diversification are supported by signing and ratifying the U.S.-Central America Free Trade Agreement (CAFTA). Honduras is also notable for its very high population growth rate of more than 2% yearly throughout the period under examination. With such a rapidly growing labour force, it also exports its labour and is in fact the fastest growing remittance destination in the region with inflows representing over a quarter of the GDP, equivalent to nearly three-quarters of all exports. Consequently, external conditions, trade and currency policy will have an important impact on growth, poverty, and inequality.

Honduras has recurrently faced serious economic crisis; in 1994, 1998/9 and then again in 2009. These crises were often disequalizing, because of the lack of available proper safety nets for poor and vulnerable population groups (Lustig, 1995). Despite improvements in tax collections and other macro-economic policies, the country continues to struggle with fiscal deficits. Since 2005, as a result of the combined effects of public policies (targeted social transfers), improved economic growth closely linked to increasing commodity prices and the fact that significant additional resources have gone directly to households through remittances, there has been a reduction in extreme poverty.

The political system in Honduras of the past 30 years has been characterized by the Liberal Party (social liberal political party) and the National Party (centre-right conservative political party) taking turns in government. As a result, there is not much variation in the kinds of policies implemented. Tax revenues have been growing continuously since 1994, beginning with Carlos Reina's government. The same occurs with the public social expenditure. It may be argued, that liberal governments have been slightly more willing to increasing debt-based social expenditure, while governments led by the National Party have been more conservative in this policy aspect. Regarding labour market policies, even when there are some labour regulations protecting workers, these regulations are quite flexible and have been systematically ignored by the government and by companies. As a result, there is much evidence on job insecurity, which remains almost unchanged. The last liberal government of Zelaya (since 2006) took a more populist turn, expanding social programmes and minimum wages,

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6 See Cardemil et al. (2000).
7 US$ 71.5 million accumulated between 2005 and 2007 according to the Honduran Secretary of Finance.
8 In 2008, remittances reached US$ 2.8 billion corresponding to 18% of GDP (Central Bank of Honduras, 2010).
and was subsequently ousted in 2009 by the military. After renewed presidential elections Lobo from the National Party was installed in 2010.

1.1.1 Macroeconomic environment, liberalization and trade imbalance

Honduras began to liberalize its international trade in 1990. As a result, total imports increased enormously; almost 12% per annum during 1990-1995, and afterwards even faster. At the same time, the growth of Honduran exports lagged well behind the surge in imports (see Figure 1.1). After the 1994 crisis where the exchange rate was drastically depreciated, GDP growth resumed and the country witnessed improved public finances, a reduction of inflation and an increase of international reserves (see Table 1.1). Nevertheless, the trade imbalance continued to grow, real interest rates increased until 2002, and the real exchange rate continued to appreciate steadily until the same year (see Table A.4 in the Appendix). The appreciation of the real exchange rate (RER) seems to be linked to significant capital inflows received after Hurricane Mitch and donor transfers for reconstruction, and more recently by increased remittances, aid and debt relief. Paz Cafferata (2003) argues that this happened despite sterilization policies of the Central Bank which proved to be insufficient.

The Honduran growth has been accompanied by low investment rates inducing a weak modernization in the productive sectors. These conditions did not facilitate an improved productivity. According to Lugones et al. (2007), the annualized change rate of the total factor productivity was -1.24 per cent between 1991 and 2003. Figure 1.1 shows how GDP growth is closely correlated with the expansion in the total amount of working hours during the 1990s. In contrast, the 2000s are characterized by higher rates of gross fixed capital formation and declining real interest rates (starting in 2002) and a divergence between the rates of expansion of labour and real GDP.

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9 Through the Macroeconomic Policy Reform Law in March 1990.
10 Total GDP grew at an annual average rate of 4.5% between 1994 and 1997, after which this trend was interrupted by Hurricane Mitch. International reserves increased from US$205 million to US$1,248 million. The fiscal deficit, excluding international transfers, dropped almost five percentage points from 8% to 3% of the GDP during the period between 1994 and 2000.
11 See also Paz Cafferata (2003).
12 Total factor productivity is commonly understood, though not without controversy, as a proxy of technological change.
13 This employment index equals the unity in 2005 and represents 102.3 million working hours per week.
### Table 1.1: Relevant macroeconomic indicators for selected periods (averages)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Remittances/GDP* (since 2000)</td>
<td>n/a</td>
<td>10.8</td>
<td>20.1</td>
</tr>
<tr>
<td>Exports of goods and services/GDP*</td>
<td>40.6</td>
<td>52.9</td>
<td>56.1</td>
</tr>
<tr>
<td>Imports of goods and services/GDP*</td>
<td>47.7</td>
<td>67.8</td>
<td>78.6</td>
</tr>
<tr>
<td>Banana price index (until 2009)</td>
<td>86.4</td>
<td>123.2</td>
<td>196.4</td>
</tr>
<tr>
<td>Coffee price index (until 2009)</td>
<td>112.2</td>
<td>90.3</td>
<td>154.7</td>
</tr>
<tr>
<td>Current account balance/GDP*</td>
<td>-6.5</td>
<td>-5.6</td>
<td>-5.3</td>
</tr>
<tr>
<td>Average inflation rate</td>
<td>18.9</td>
<td>10.7</td>
<td>6.4</td>
</tr>
<tr>
<td>Maximal inflation rate</td>
<td>28.8</td>
<td>30.8</td>
<td>7.2</td>
</tr>
<tr>
<td>Real exchange rate (2000=100)</td>
<td>121.8</td>
<td>99.8</td>
<td>99.0</td>
</tr>
<tr>
<td>Real interest rate</td>
<td>19.36</td>
<td>9.26</td>
<td>7.10</td>
</tr>
<tr>
<td>Overall balance central government/GDP*</td>
<td>-3.2</td>
<td>-3.48</td>
<td>-2.13</td>
</tr>
<tr>
<td>Debt/GDP*</td>
<td>120.8</td>
<td>69.1</td>
<td>32.6</td>
</tr>
<tr>
<td>Tax revenues/GDP*</td>
<td>13.2</td>
<td>14.1</td>
<td>15.4</td>
</tr>
<tr>
<td>Public social spending/GDP*</td>
<td>5.92</td>
<td>8.92</td>
<td>9.90</td>
</tr>
<tr>
<td>Public social security spending/GDP*</td>
<td>0.28</td>
<td>0.22</td>
<td>0.36</td>
</tr>
</tbody>
</table>

Note: * percentages.


This divergence may be the consequence of productivity improvements.\(^{14}\) However, these averages do not let us see just how unequal the improvement (deterioration) of the labour productivity has been across the working population which we discuss below.

As in many developing countries (and in contrast to the richer middle-income economies of Latin America), the agricultural sector employs more people than any other sector. Although other sectors have been gaining importance, the agricultural sector still provides over one-third of jobs overall and over 55% in rural areas. Improvements in the agrarian production have not translated into higher labour incomes, presumably because of stagnant productivity given the low competitiveness of this sector, partly a consequence of the appreciated RER, insufficient capital investment, and the effects of the Hurricane Mitch on infrastructure and soil productivity.\(^{15}\) After 2005, the commodity price booms in cof-

\(^{14}\) It is possible to observe in Figure 1.1 that the slope of the employment expansion is not decreasing over time.

\(^{15}\) For instance, between 1991 and 1999, the number of tractors per 100 km\(^2\) increased by about 13%, while the number of workers in the agricultural sector rose by 19% during...
fee and bananas significantly improved the situation in the agricultural tradable sector, a development that has continued to this day.\textsuperscript{16}

Contrary to this, and consistent with the appreciation of the RER since the early 1990s, the non-tradable sector appears to gain momentum. During the last two decades, a shift in the productive path, value generation and labour earnings can be observed. Household surveys show that earnings in agriculture, as a share of total earnings, declined from 28\% in 1991 to 20\% in 1999 and to 17\% in 2007, while the share of labour incomes in non-tradable sectors such as commerce, transport, construction and basic services grew from 29\% in 1991 to 39\% in 2007. Other tradable sectors such as the manufacturing sector (\textit{maquiladoras}) maintain a constant employment share.\textsuperscript{17}

\textit{Figure 1.1: Selected macroeconomic indicators, 1990-2008}

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\textsuperscript{16} See Figure A.1 in the Appendix for a development of coffee and banana prices.

\textsuperscript{17} Figures obtained based on EPHPM I and II.
1.1.2 Sector-related changes in earnings: tradables versus non-tradables

An overvaluation of the RER will induce a loss of relative competitiveness of the tradable sector while favouring the non-tradable sector. The tradable sector consists of formal and informal employment of agriculture and livestock activities, mining and manufacture. The non-tradable sector consists of formal and informal employment in basic services (electricity, water, and gas), construction, commerce, transport, financing and other services. This hypothesis is supported in Figure 1.2, which shows that in both rural and urban areas, there is a rising gap between labour earnings in the non-tradable and the tradable sectors. Remarkably, this is true even if considering the fact that a considerable share of non-tradable employment are informal sector activities with low earnings. In fact, it turns out that in the early 1990s, earnings at the low end of the earnings distribution of the non-tradable sector were below those at the low end in the tradable sector. By 2005, the earnings in the non-tradable sector were considerably above those in the tradable sector. Consequently, the tradable sector has relatively declined over the last two decades.18

How would the expansion of the non-tradable sector affect inequality? The answer depends on the initial levels of inequality within and between the two sectors, and on how efficient labour markets are in reallocating workers from the tradable to the non-tradable sector. If workers can be reallocated easily, we would not expect large effects as workers move across sectors with little loss of earnings. Figure 1.3 shows evidence of this issue in rural areas. While low-earners in the tradable sector (top panels) suffered steep real earnings declines between 1991 and 2005, low-earners in the non-tradable sector seem to have kept their labour income stable between 1991 and 1999, and even improved their performance between 1999 and 2005. Why were low earners in the tradable sector not able to move to the non-tradable sector and profit from growing labour incomes?

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18 According to household surveys, the share of wages in the tradable sector in rural areas declined from 67% of total wages in 1991 to 56% in 2007 (and from 25% and 22% of wages in urban areas).
Figure 1.2: Earnings and employment: tradable and non-tradable sectors, 1991-2007

Note: Avg. labour earnings in Lempiras of 1999.
Source: Authors’ calculations based on EPHPM I and EPHPM II.

Figure 1.3: Growth incidence curves: monthly earnings in the tradable and non-tradable sectors in rural areas, 1991-2007

Note different y-axis scales.
Source: Authors’ calculations based on EPHPM I and EPHPM II.
The hypothesis here is that, in an economy where mobility cost changes across skill levels (observables and unobservables) with a technology exhibiting capital-skill complementarity, neo-liberal policies allowing a decline in the tradable sector will translate into the (considerable) disequalization of labour incomes during this period (1991-2005).

Given that the free-trade openness is the more relevant structural change taking place during the 1990s in Honduras, the next section covers the relationship between international trade and inequality. Moreover, the main conclusions of a model by Devillanova et al. (2010) explaining the consequences of a trade-induced sectoral shift on inequality will be presented. The model is based on workers' heterogeneity and capital-skill complementarity, which appear to be realistic assumptions for the Honduran economy.

### 1.1.3 Workers' heterogeneity and capital-skill complementarity

There is much evidence which suggests that income inequality increases after trade liberalization takes place. López-Calva and Lustig (2010) state that many Latin American governments adopted market-oriented reforms to pull the economy out of crisis. They argue that the inequality increase during the 1990s was partially driven by a significant increase in relative returns to tertiary education and that this was consistent with a skill-biased technological change after the adoption of trade liberalization reforms.19

According to the predictions of the classical trade models, the 1995-2002 RER overvaluation and declining commodity prices possibly encouraged a reallocation of factors towards the non-tradable sector in Honduras. Given this, there is evidence that the imperfect mobility of workers would translate into low levels of labour reallocation reducing the benefits of trade integration (see Papageorgiou et al., 1991 and Wacziarg and Wallack, 2004). Additionally, according to Devillanova et al. (2010), if moving costs and skills are correlated and there is capital-skill complementarity, a trade-induced sectoral shift would increase

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19 See Gasparini and Cruces (2010), Cragg and Eppelbaum (1996) and Jaramillo and Saavedra (2010). Figure 1.6 shows that this is true for Honduras between 1990 and 1995, at least in rural areas. This is a period characterized by a strong devaluation and the opening up of the economy. Note that the rise in the skill premium can be explained by an increasing demand for those with secondary-level education or higher in rural areas. Thereafter, the Honduran economy faces a continuous appreciation of the RER and declining commodity prices until 2002.
wage inequality between different skill levels in a sector and within skill levels across sectors (Figures 2 and 5 in Devillanova et al., 2010).

The assumption of a positive correlation between skills and moving costs is based on the idea that highly educated workers develop more general abilities, which have a productive value across all sectors and occupations. Contrary to this, less-skilled workers are characterized by abilities that are typically less transferable. Devillanova et al. (2010) mention a variety of studies supporting the hypothesis of higher internal mobility of the more educated workers.20 In Honduras, we additionally find that migrants are also more likely to belong to the more educated households.21 Thus, the deplorable levels of education in rural areas will reinforce internal immobility, particularly for those in the tradable sector.22

Between 1991 and 1995, the opening up of trade and investment and the devaluation of the RER favoured the tradable sector. Here, the capital-skill complementarity might explain the one-time disequalizing effect of skill-biased technical change. A confirmation of this can be found in Figure 1.2, where until 1993, the wage gap between sectors seems to disappear.23 Starting in 1994, the tradable sector faces important difficulties due to increasing real interest rates, the progressive appreciation of the RER together with declining commodity prices and Hurricane Mitch in 1998. On the other hand, the non-tradable sector shows increasing earnings, due to disproportionate investments as a result of the favourable macro-conditions (capital inflows). Consequently, this sector increases its skill intensity and skill premium. At the same time, relative labour incomes for unskilled workers also increase in the non-tradable sector (relative to those in the tradable sector). This occurs due to the complementarity between

20 The more educated workers find jobs easily and have lower transaction costs (Greenwood, 1975; Bednarzik, 1993 and Helwing, 2001). They also learn faster and are able to implement modern technologies and perform new activities more efficiently (Nelson and Phelps, 1966; Bartel and Lichtenberg, 1987). Moreover, they are more likely to change a job voluntarily (Magnani, 2001; Tomkins and Twomey, 2000). Here, internal mobility refers to movements across industry, sectors and geographical areas.

21 In section 1.5, we show the predicted migration flows accounting for productivity differentials. They are based on a structural probability model, which account for the self-selection bias in the rural-urban migration process. Results suggest that the household education is an important determinant of the migration probability. Villalobos Barría (2012) reaches the same conclusion for the rural-urban migration pattern in Chile during the period 2002-2006.

22 According to EPHPM 1999, rural workers belong to households with an average of 2.32 and 3.11 years of education in the tradable and non-tradable sectors, respectively.

23 Here, the wage disequalization is explained mainly through increasing returns to education (and skills).
the two types of labour and the insufficient migration of less-skilled workers towards the dynamic sector. Consequently, skilled and unskilled workers now perform better-off in the attractive sector (relative to those in the tradable sector), as shown in Figure 1.3. The labour income distribution becomes more unequal due to the evolution of the inter-sectoral wage gap taking place across the whole ability distribution.

Section 1.4 proposes a methodology to account for this evolution. It assesses the inequality effects of the observed change in the wage gap between sectors and aims to isolate the inequality changes related to the distribution of skills from those which are exclusively related to changes in the relative competitiveness of the tradable sector.

1.1.4 A dysfunctional and highly dualistic educational system

Average education in the Honduran labour force has increased only marginally over time (see Table 1.2). At the country level, during the period 1991-2007, the number of years of education of the Honduran labour force rose from only 5.1 to a still very poor 6.0. Furthermore, education lagged behind in rural areas; in 1991, urban labour force participants had over seven years of education (at about a secondary education level) versus 3.6 years of education in rural areas (less than a primary education level). Second, there are also marked differences regarding changes in the structure of educational levels, most likely linked to different educational opportunities as well as rural-urban migration (see below). Although the proportion without formal education has been steadily declining in urban and rural areas alike, in rural areas this was made up with increasing shares of people with intermediate education, while in urban areas the largest increase was among those with tertiary education.

The accelerated expansion of tertiary education in urban areas dominates changes in the distribution of education at the country level. Given the (often convex) link between education and earnings, educational progress in urban areas may serve to disperse the labour income distribution.24

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24 The disequalization of the earnings distribution may occur even when the Gini coefficient of years of schooling shows a monotonic decreasing trend (1991-2007), which has been termed the 'paradox of progress.' In previous studies for Argentina and Mexico, the Gini for educational attainment declined while earnings inequality increased; see Gasparini et al. (2005) for Argentina and Legovini at al. (2005) for Mexico.
Table 1.2: Changes in the educational structure of the Honduran labour force, 1991-2007

<table>
<thead>
<tr>
<th>Educational structure</th>
<th>Per cent</th>
<th>Annualized change*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country level</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Without</td>
<td>20.0</td>
<td>16.7</td>
</tr>
<tr>
<td>Less than secondary</td>
<td>57.8</td>
<td>58.0</td>
</tr>
<tr>
<td>Less than tertiary</td>
<td>18.1</td>
<td>20.0</td>
</tr>
<tr>
<td>Tertiary</td>
<td>4.1</td>
<td>5.3</td>
</tr>
<tr>
<td>Years of schooling</td>
<td>5.1</td>
<td>5.4</td>
</tr>
<tr>
<td>Gini coefficient</td>
<td>45.4</td>
<td>43.0</td>
</tr>
<tr>
<td>Rural areas</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Without</td>
<td>27.4</td>
<td>24.1</td>
</tr>
<tr>
<td>Less than secondary</td>
<td>64.3</td>
<td>65.5</td>
</tr>
<tr>
<td>Less than tertiary</td>
<td>7.8</td>
<td>9.6</td>
</tr>
<tr>
<td>Tertiary</td>
<td>0.5</td>
<td>0.9</td>
</tr>
<tr>
<td>Years of schooling</td>
<td>3.6</td>
<td>3.8</td>
</tr>
<tr>
<td>Gini coefficient</td>
<td>47.6</td>
<td>45.8</td>
</tr>
<tr>
<td>Urban areas</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Without</td>
<td>10.6</td>
<td>8.7</td>
</tr>
<tr>
<td>Less than secondary</td>
<td>49.3</td>
<td>49.8</td>
</tr>
<tr>
<td>Less than tertiary</td>
<td>31.4</td>
<td>31.3</td>
</tr>
<tr>
<td>Tertiary</td>
<td>8.7</td>
<td>10.2</td>
</tr>
<tr>
<td>Years of schooling</td>
<td>7.1</td>
<td>7.2</td>
</tr>
<tr>
<td>Gini coefficient</td>
<td>37.2</td>
<td>35.4</td>
</tr>
</tbody>
</table>

Note: * in percentage points; Gini coefficient based on the years of schooling distribution.
Source: Authors’ calculations based on data from EPHPM I and EPHPM II.

1.1.5 Education reforms and crisis during the 1990s

During the early 1990s, market-oriented reforms designed to pull economies out of a crisis were implemented in Honduras, including changes that affected educational policies. Barahona and Blas (2008) argue that reforms were implemented with the purpose of decentralizing and incorporating the private sector in the educational process. Despite these efforts, the Honduran educational system is still deficient in coverage and quality. Lack of funds, a shortage of

Private education has flourished during the last decades. Private schools do not have as much academic prestige in Honduras. Nevertheless, wealthy families choose to send their children to private schools because they still convey a higher social status and more amenities.

Following Barahona and Blas (2008), coverage was one of the central goals of the reform implemented by the government of Carlos Reina. However, decentralization and fragmentation of the administrative structure ended up with a reduced investment in ed-
1.1. INTRODUCTION

Teachers (particularly in rural areas), poor pedagogic training, and obsolete curricula are some problems which the Honduran educational system has to deal with.\(^{27}\) Such problems are not surprising given the modest spending levels in education. Public spending in education in Honduras is far from the more advanced educational systems in Latin America. While public spending in education per-capita in Honduras reached US$40 in 2000, Argentina and Chile were spending US$520 and US$208 respectively.\(^{28}\) However, just within the last decade, public spending in education in 2008 has doubled in absolute terms, reducing the gap to other countries. Unfortunately, given that public spending on education in Honduras is already quite high as a share of the GDP, considerable complementary financial flows will be required to enhance educational resources further.

1.1.6 Rural-urban migration

Changes in the structure of education of the labour force are a consequence of fertility rates, efficiency and coverage of the schooling system and migration. While fertility rates and the nature of the schooling system tend to change slowly over time, internal migration may have an extraordinary impact on origin and destination areas (rural and urban areas). In order to understand the contribution of internal migration on changes in the educational distribution and thus on inequality, we estimate migration flows in the origin controlling for the fact that, after migration, migrants in urban areas may decide to enrol or to continue current studies, and consequently, ex-post estimates of the structure of education overstate the educational attainment of rural-urban migrants at the time of migration.

For this reason, we estimated a structural model for internal migration based on the extended Roy model.\(^{29}\) Table 1.3 compares the educational structure of the net migrant group with the observed structure in rural and urban areas in 1994 and 1999. By comparing both structures, it is clear that rural-urban migra-

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\(^{27}\) Additionally, according to the background notes by the U.S. Department of State, Hurricane Mitch damaged more than 3,000 schools nationwide.

\(^{28}\) According to the ECLAC, Social Development Division.

\(^{29}\) The extended Roy model finds a suitable counterpart in a switching regression model, presented by Goldfeld and Quandt (1973) with endogenous switching (Maddala and Nelson, 1975; Maddala, 1983). Technical details about the estimation procedure are available upon request.
tion increases educational inequality in urban areas, as the share of migrants with no education by far exceeds the share of urban residents with no education.

Table 1.3: Structures of education for the net migrants and by areas, Honduras, 1994-1999

<table>
<thead>
<tr>
<th></th>
<th>Urban areas</th>
<th>Rural areas</th>
<th>Internal migrants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Without</td>
<td>9.34</td>
<td>8.88</td>
<td>22.49</td>
</tr>
<tr>
<td>Less than secondary</td>
<td>52.40</td>
<td>50.88</td>
<td>67.39</td>
</tr>
<tr>
<td>Less than tertiary</td>
<td>32.05</td>
<td>32.44</td>
<td>9.76</td>
</tr>
<tr>
<td>Tertiary</td>
<td>6.21</td>
<td>7.80</td>
<td>0.36</td>
</tr>
</tbody>
</table>

Note: The educational structure of migrants controls for the fact that some migration has taken place for education. See Villalobos Barría (2012) for further details.

Source: Authors’ calculations based on EPHPM I and EPHPM II.

In contrast, it should reduce inequality in rural areas as migrants are disproportionately drawn from the high end (less than secondary) of the distribution of education. This must be kept in mind when interpreting changes in inequality. Finally, this result points out the validity of the workers' heterogeneity assumption (correlation between mobility costs and skills).30

1.1.7 Inequality change in Honduras

Figure 1.4 depicts inequality trends in household per-capita income and labour earnings. Inequality in household per-capita income increased steadily since 1991 over a period of more than ten years and started to decrease after 2005, a trend which appears to have continued beyond 2007, the last comparable data set in our analysis. The inequality increase appears to be heavily influenced by an increase of rural inequality (and possibly rural-urban shifts), while urban inequality changed very little during that time period. Moreover, changes in inequality at the country level appear to be closely related to increasing labour earnings inequality,31 which also reaches its peak in 2005.32

30 This is because migration from rural to urban areas is, to some degree, overlapped with the migration from tradable (mainly agriculture) to the non-tradable sector.
31 See Figure A.2 in the Appendix.
32 The inequality peak is not driven by outliers. In order to check the robustness of our Gini estimates, we excluded the top and bottom 5% of observations from the income distributions. Trends are not affected by outliers and confirm the finding that in 2005 income inequality reached its highest level within the period of observation.
1.1. INTRODUCTION

Based on the discussion above, our hypothesis about inequality trends is that extremely low levels of human capital accumulation, particularly in rural areas, together with neo-liberal labour market institutions and an appreciated real exchange rate worsened rural incomes, in particular, those at the bottom of the distribution of the tradable sector. To analyze inequality change using various decomposition techniques, we divide our analysis into three periods, 1991-1999 (just after Hurricane Mitch), 1999-2005 (the year of highest inequality) and 2005-2007.

1.2 Micro-econometric decomposition I: The proximate determinants of changes in income inequality

In this section, we present evidence regarding the relative importance of demographics, labour markets, (international) remittances, government transfers (social policies) and other non-labour income (principally capital incomes and domestic private transfers) in explaining inequality changes in the distribution of household per-capita income between 1991 and 2007. Following the methodology proposed by Barros et al. (2006), we are able to identify and quantify these
determinants using a series of counterfactual simulations. In this study, our extended methodology allowed us to assess the impact of government transfers, remittances and other non-labour income on inequality changes.

Putting technical aspects of the decomposition aside, the empirical approach is based on the following tree of identities:

\[ y = a \times r \]  
\[ r = o + t \]  
\[ t = u \times w \]  
\[ o = \text{rem} + \text{soc} + \text{nrs} \]  

Hence,

\[ y = a \times [(\text{rem} + \text{soc} + \text{other}) + u \times w] \]  

Where \( y \) is the household per-capita income, \( a \) corresponds to the proportion of working adults in the household, \( r \) the household income per adult, \( o \) corresponds to the household non-labour income per adult and \( t \) represents the household labour income per adult. The variable \( u \) represents the proportion of working adults in the household and \( w \) is the labour income per working adult in the household. Finally, in this extended specification (Identity (5)) remittances per adult in the household are symbolized by \( \text{rem} \), while government transfers per adult in the household are represented by \( \text{soc} \), and \( \text{other} \) represents other household non-labour income per adult. As mentioned by Barros et al. (2006), since we are dealing with identities, any change in the income distribution must be related to changes in the joint distribution of these proximate determinants.

To clarify our notation in Table 1.4, in the decomposition presented by Identity (1), for example, we define \( \Delta_a \) as the proportion of change of the Gini coefficient, resulting from changes in the distribution of the percentage of adults in the household. \(^{33}\) In the same way \( \Delta_r \) is the proportion of change of the Gini coefficient, resulting from changes in the distribution of the household income per adult. Finally, \( \Delta_{a \rightarrow r} \) captures the proportion of change of the Gini coefficient resulting from changes in the association between the proportion of adults in household \( a \) and the household income per adult \( r \). Using the same notation, the contribution caused by changes in the remaining proximate determinants, and their respective associations on changes in labour income inequality, are illus-

\(^{33}\) Since we estimate whole distributions, we strictly decompose distributional changes (which are evaluated using the Gini coefficient), rather than a direct change in the Gini coefficient.
trated in Table 1.4 (Identity (5)). Tables A.5 and A.6 in the Appendix show separate results for urban and rural areas.

**Table 1.4: Percentage contribution of the proximate determinants to inequality changes of the household per-capital income, 1991-2007**

<table>
<thead>
<tr>
<th>Determinant</th>
<th>ΔGini = 2.7 points 1991-99</th>
<th>ΔGini = 4.2 points 1999-2005</th>
<th>ΔGini = -5.2 points 2005-07</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1) (2) (3)</td>
<td>(1) (2) (3)</td>
<td>(1) (2) (3)</td>
</tr>
<tr>
<td>Δ_{g→r}</td>
<td>-10.77 -10.77 -10.77</td>
<td>11.49 11.49 11.49</td>
<td>1.87 1.87 1.87</td>
</tr>
<tr>
<td>Δ_o</td>
<td>0.04 0.04 0.04</td>
<td>-3.16 -3.16 -3.16</td>
<td>-2.93 -2.93 -2.93</td>
</tr>
<tr>
<td>Δ_r</td>
<td>110.7 91.7</td>
<td>-98.9</td>
<td></td>
</tr>
<tr>
<td>Δ_{o→t}</td>
<td>11.10 11.10</td>
<td>-0.54 -0.54 -0.54</td>
<td>-2.72 -2.72 -2.72</td>
</tr>
<tr>
<td>Δ_o</td>
<td>-24.23 -24.23</td>
<td>0.80 0.80</td>
<td>-51.2 -51.2</td>
</tr>
<tr>
<td>Δ_t</td>
<td>123.86 91.41</td>
<td>-45.1</td>
<td></td>
</tr>
<tr>
<td>Δ_{u→w}</td>
<td>-47.86 3.61 3.61</td>
<td>19.1 19.1 19.1</td>
<td></td>
</tr>
<tr>
<td>Δ_u</td>
<td>-2.18 10.29 10.29</td>
<td>-6.9 -6.9 -6.9</td>
<td></td>
</tr>
<tr>
<td>Δ_w</td>
<td>173.89 77.51 77.51</td>
<td>-57.3 -57.3 -57.3</td>
<td></td>
</tr>
<tr>
<td>Δ_{rem→nrem}</td>
<td>5.10 18.78 18.78</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Δ_{rem}</td>
<td>-7.32 -43.6 -43.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Δ_{nrem}</td>
<td>3.02 -26.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Δ_{soc→other}</td>
<td>10.22</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Δ_{soc}</td>
<td>-11.74</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Δ_{other}</td>
<td>-24.79</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ΔTotal</td>
<td>100 100 100</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Δ_r is decomposed in Δ_{o→t} + Δ_o + Δ_t as Δ_t in Δ_{u→w} + Δ_u + Δ_w, Δ_o in Δ_{rem→nrem} + Δ_{rem} + Δ_{nrem} and Δ_{nrem} in Δ_{soc→nsoc} + Δ_{soc} + Δ_{nsoc}.

Source: Authors’ calculations based on EPHPM I and EPHPM II.

### 1.2.1 First sub-period: The nineties (1991-1999) – labour market-driven inequality increase

During this period, demographic changes a and their association with the distribution of the household income per adult Δ_{g→r} contributed towards equalizing the per-capita household income distribution y, while the distribution of the household incomes per adult r explains about 110% of the disequalizing trend during this decade. By decomposing r, it is possible to assess the role of the household labour and non-labour income per adult, t and o respectively. While non-labour income were equalizing, labour incomes are the main driver in the observed inequality increase. When looking at household labour incomes per
adult \( t \), the decomposition presented in column (3) allows us to assess the role of changes in the proportion of working adults \( u \) and the importance of changes in monthly earnings per working adult \( w \). While \( u \) is not capable of explaining any inequality change, changes in monthly earnings are by far the greatest contributor to the disequalization of \( y \). The association between the distribution of employment and earnings reduces, to some extent, this extraordinary disequalizing force.

While in urban areas, the slight equalization of the household per-capita income distribution is driven by changes in non-labour income per adult, in rural areas the story seems to be pretty much the same as what we observe at the country level, where the distribution of monthly earnings is the main disequalizing factor.

### 1.2.2 Second sub-period: The nineties II (1999-2005) – labour market-driven inequality increase

This second period shows similar results as the decade of the 1990s; monthly earnings are by far the main inequality driver. The only notable difference is that in urban areas the distribution of employment explains almost one-fourth of the 2.4 Gini points increase between 1999 and 2005. Information regarding the reception of remittances at the household level became available in the household surveys since 1997; this information enables us to assess the impact of remittances on the distribution of household per-capita income. Initially, the decomposition shown in column (3) shows a limited impact of non-labour income on inequality changes. This impact is broken down in column (4) into remittances, on the one hand, and other non-labour income (government transfers, capital incomes and other private transfers) on the other. At a country level and in rural areas, the impact is almost nonexistent, while in urban areas, the impact is slightly disequalizing.

### 1.2.3 Third sub-period: Inequality decrease (2005-2007) – recovery of the tradable sector, equalizing remittances and expanding social transfers

The period between 2005 and 2007 is characterized by a strong equalization in the household per-capita income distribution with a decrease by 5.2 Gini points at the country level, and by 7.3 and 3.2 Gini points in rural and urban areas, respectively. It is worth noting that changes in labour earnings and non-labour in-
come are responsible, almost in equal proportions, for the equalization pattern observed at the country level during this period. However, labour earnings, as a driver for reducing inequality, appear to be more relevant in rural areas than in urban areas. On the other hand, non-labour income are extraordinarily equalizing in all areas explaining about 43% of the equalization in rural areas and about 80% in urban areas.

What explains the equalizing effect of labour markets? Why are they now producing more equity after having done the opposite in previous periods? The period between 2005 and 2007 is characterized by the commodity boom that also affects Honduras' main exports, coffee and bananas (Appendix, Figure A.1), thereby improving conditions in the tradable sector for the first time.

By decomposing the equalizing impact of non-labour income per adult, we are able to assess the impact of remittances on inequality. Columns 4 and 5 show that non-labour income accounts for 51% of equalization and that almost 44% of this equalization can be attributed to remittances, almost 25% to private transfers and capital incomes, and almost 12% to government transfers. The association between the aforementioned proximate determinants tends to discale the household per-capita income distribution diminishing, to some extent, the equalizing trend, suggesting that government transfers and private transfers, while both being equalizing on their own, increase inequality due to the rising association between them. Remittances have a stronger impact in rural areas, but the net impact, considering the association between the distribution of remittances and other non-labour income, is almost the same in both areas (about 30%).

With respect to the impact of remittances, Figure 1.5 shows the evolution of the amount of per-capita remittance receipts by total household income quantile using an index (2002=100). Remittances across income quantiles do not exhibit any clear pattern until 2004, which explains why remittances had no equalizing or disequalizing effect.

On the contrary, starting from this year, the poorest seem to have benefited disproportionately from remittances (both in the number of beneficiaries among the poor as well as absolute amounts), leading to falling non-labour inequality as shown above.

Regarding policy changes, the period between 2005 and 2007 is of extraordinary interest due to the political transition that occurred in Honduras at the beginning of 2006, when the government switched from a centre-right conservative political party, headed by Ricardo Maduro, towards a left-wing populist inspired government led by Manuel Zelaya. In particular, cash transfer policies are critical here. Already in the early 1990s, a government conditional cash transfer
program (PRAF) was created to minimize the undesirable effects produced by the neo-liberal adjustment programs implemented during the 1990s.

The first version of the program (PRAF-I) was implemented between 1992 and 1998. The Inter-American Development Bank (IADB) criticized PRAF-I for its leakage and poor targeting, as well as for ignoring supply side weaknesses (Moore, 2008). An adjusted program, PRAF-II was launched in 1998, being better targeted to rural areas. The program was aimed to support areas with the weakest infrastructure in the country. This design considered the supply-side incentives more importantly. It appears that the rural poor were still underrepresented in the beneficiary composition (Moore, 2008).

A third IADB loan program was launched under Zelaya’s government in 2007 (PRAF-III).34 His government aimed to adapt existing components and to create new ones, to fight low levels of human capital and chronic poverty. In-

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34 It may be argued that this credit was possible because Honduras reached the HIPC (Heavily Indebted Poor Countries) completion point and benefit from the MDRI (Multilateral Debt Relief Initiative) in 2006.
Indeed, previously existing PRAF components had not been able to solve these problems. Conclusions from previous experiences were taken into account when designing the new program, particularly regarding the targeting of extremely poor households and the amount of transfers. During Zelaya’s government, approximately 18-20 per cent of PRAF expenditure was transferred to extreme poor rural households (Moore, 2008). In Table 1.5, Zelaya’s approach to transfers can be clearly distinguished from today’s (2011) policies and those from 2005 and 2006 in terms of scope and transferred amounts per beneficiary.

Table 1.5: Basic Data on Conditional Cash Transfer programme (PRAF), selected years

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of beneficiaries</td>
<td>628,476</td>
<td>566,977</td>
<td>672,619</td>
<td>969,744</td>
<td>436,000</td>
</tr>
<tr>
<td>Total investment (1000 Lempiras)</td>
<td>407,706</td>
<td>370,009</td>
<td>573,527</td>
<td>639,517</td>
<td>313,830</td>
</tr>
<tr>
<td>Total investment (Mio. current US$)</td>
<td>21.6</td>
<td>19.6</td>
<td>30.3</td>
<td>33.8</td>
<td>16.5</td>
</tr>
<tr>
<td>Investment per beneficiary (current US$)</td>
<td>34.3</td>
<td>34.5</td>
<td>45.1</td>
<td>34.9</td>
<td>37.8</td>
</tr>
</tbody>
</table>

Source: Based on PRAF and Ministry of Finance (n.d.).

Table 1.6 shows how the structure of income changed considerably between 2005 and 2007. While labour incomes became less important, non-labour income grew substantially, mainly because of a considerable increase in government transfers, followed by remittances. Consistent with Table 1.4, social policy was starting to have an impact on inequality; but the scope of the program appears to have been cut back since then as shown in Table 1.5.

Even when the IADB loan contributed towards significantly expanding the PRAF programs, the impact on inequality depended on the targeting design and the implementation of the transfers. Barros’ decomposition gives us information regarding both issues.

Our results show that the contribution of government transfers appears to equalize the income distribution; however, their rising association with other non-labour income cancelled out this impact. This means, that even when government transfers are, for the most part, equalizing, they are received mainly by households, which increasingly also rely on other non-labour income sources such as remittances, private transfers and capital incomes.

In summary, non-labour income was strongly equalizing the income distribution at the country level, driven by the rising equalization of remittances, private transfers, and government transfers. When examining rural and urban areas separately, labour incomes are much more important drivers of equalization in

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35 For more information about the PRAF components, outcomes and expenditures see Moore (2008).
rural areas while in urban areas, remittances and other transfers play a relatively larger role. Government transfers also contribute towards equalization in both areas, but the impact remains modest.

Table 1.6: Income categories, 2005 and 2007 (in Lempiras of 1999)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total per-capita labour incomes</td>
<td>680.39</td>
<td>787.74</td>
<td>78.49</td>
<td>76.71</td>
</tr>
<tr>
<td>Total per-capita non-labour income</td>
<td>186.50</td>
<td>239.16</td>
<td>21.54</td>
<td>23.29</td>
</tr>
<tr>
<td>Government transfers (mainly PRAF)</td>
<td>45.12</td>
<td>63.02</td>
<td>5.20</td>
<td>6.14</td>
</tr>
<tr>
<td>Remittances</td>
<td>90.16</td>
<td>112.55</td>
<td>10.40</td>
<td>10.96</td>
</tr>
<tr>
<td>Other income (private transfers &amp; capital incomes)</td>
<td>50.58</td>
<td>63.33</td>
<td>5.84</td>
<td>6.17</td>
</tr>
</tbody>
</table>

Source: Authors’ calculations based on EPHPM I and EPHPM II.

1.3 Micro-econometric decomposition II: Determinants of changes in labour income inequality

As illustrated in our previous decomposition, changes in the distribution of labour incomes are by far the greatest contributor to the disequalization of the household per-capita income distribution between 1991 and 2005, particularly at the country level and in rural areas where most of the inequality change took place. For this reason, by using another decomposition technique, we analyze inequality changes of labour earnings more thoroughly.

Table 1.7 shows that inequality in labour earnings rose by more than 7% between 1991 and 1999, and then again, by 4.5% between 1999 and 2005. In the two years that followed, labour inequality decreased by more than 3%. Gini coefficients for urban and rural areas show very different behaviours over time. Changes in inequality seem to be extremely accentuated in rural areas, while there are no significant trends in urban areas. Table A.3 in the Appendix shows rates of pro-poor growth in labour earnings observed during the periods between 1991-1999, 1999-2005 and 2005-2007. Earning changes were biased against the poor between 1991 and 2005, while in the subsequent period (2005-2007) they were strongly pro-poor. Changes in the slope of the growth incidence curves are mainly driven by what happened within low-earners (vulnerable) in rural areas.

36 According to household survey data, about 94%, 88%, 78.5% and 76.7% of the household per-capita income have been generated through labour activities in 1991, 1999, 2005 and 2007 respectively.
Table 1.7: Gini coefficient changes - monthly labour earnings distribution

<table>
<thead>
<tr>
<th>Period</th>
<th>Whole country</th>
<th>Urban areas</th>
<th>Rural areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>1991</td>
<td>50.80</td>
<td>49.08</td>
<td>49.15</td>
</tr>
<tr>
<td>1999</td>
<td>54.52</td>
<td>49.99</td>
<td>55.13</td>
</tr>
<tr>
<td>Change</td>
<td>7.3%</td>
<td>1.9%</td>
<td>12.2%</td>
</tr>
<tr>
<td>1999</td>
<td>54.52</td>
<td>49.99</td>
<td>55.13</td>
</tr>
<tr>
<td>2005</td>
<td>57.00</td>
<td>49.46</td>
<td>60.88</td>
</tr>
<tr>
<td>Change</td>
<td>4.5%</td>
<td>-1.1%</td>
<td>10.4%</td>
</tr>
<tr>
<td>2005</td>
<td>57.00</td>
<td>49.46</td>
<td>60.88</td>
</tr>
<tr>
<td>2007</td>
<td>55.01</td>
<td>49.19</td>
<td>55.88</td>
</tr>
<tr>
<td>Change</td>
<td>-3.5%</td>
<td>-0.5%</td>
<td>-8.2%</td>
</tr>
</tbody>
</table>

Source: Authors’ calculations based on EPHPM I and EPHPM II.

Many different forces exist behind the long-run changes in income distributions or, more generally, distributions of economic welfare within a population. Some of these forces have to do with changes in the distribution of factor endowments and socio-demographic characteristics, while others have to do with the returns these endowments produce and others with changes in the populations’ behaviour such as labour supply, consumption patterns or the decision of whether or not to have children. These forces are not independent from each other. This is what makes it difficult to identify fundamental causes and mechanisms behind the dynamics of income distribution.

Decomposition techniques are used to identify drivers of distributional changes. Traditional techniques explain differences in scalar summary measures of distributions rather than in full distributions. The best known of these techniques is the Oaxaca-Blinder decomposition of differences in mean incomes across population groups with different characteristics (Blinder, 1973; Oaxaca, 1973) and the variance-like decomposition property of the so-called decomposable summary inequality measures (Bourguignon 1979; Cowell 1980; Shorrocks 1980). To assess the relevance of the various factors on income inequality changes, handling whole distributions instead with averages, a micro-econometric decomposition methodology first proposed by Bourguignon et al. (1998) was adjusted and applied to the Honduran case. In particular, we will concentrate principally on returns to education and changes in education structure at the individual and household level, as well as changes in the returns to

37 Variants of the basic methodology have been applied in Altimir et al. (2000), Bourguignon et al. (2001), Gasparini et al. (2005), Legovini et al. (1998) and Ferreira and Paes de Barros (1998), amongst others. See the basics of this decomposition in the Appendix. See also Bourguignon and Ferreira (2005).
occupations and sectors, which reflect the shifts between tradable and non-tradable sectors.³⁸

### 1.3.1 Estimation strategy

Changes in inequality are always dependent on the years being compared. For this reason, it is crucial to provide reasons for the selection of years. We decided to decompose changes in Gini of labor incomes for the periods comprised between 1991 to 1999, 1999 to 2005 and 2005 to 2007. We include 1991 and 2007 because we want to have the broadest possible perspective that our data allows. We additionally include 2005 because, as shown above, this is where labor income inequality reaches its peak. Through the inclusion of this turning point in the decomposition, it is possible to study the determinants of the equalization, rather than the disequalization of the labor income distribution. We include 1999 in the decomposition because it offers the possibility to control for the impact of the 1998 Hurricane Mitch on the labor income distribution.

Let \( \beta \) be the vector of parameters determining market hourly earnings and \( \lambda \) the vector of parameters affecting employment outcomes (hours of work and participation). In order to estimate the equations for earnings and working hours, it is necessary to estimate the vector parameters \( \beta \) and \( \lambda \). Since we do not have a socio economic panel survey for Honduras, we have to rely on a procedure which allows to replicate the structure of observed and unobserved characteristics of the year \( t \) into the year \( t_2 \) and vice versa.

\( H_i \) is the number of working hours by worker \( i \) and \( w_i \) indicates the hourly earnings received by the same individual. In a process of utility maximization, \( H_i \) is the optimal number of working hours, being determined based on market conditions. Heckman (1974) states that it is possible to derive an estimable reduced form, starting from a structural system obtained from a utility maximization problem of labour-consumption decisions. Individuals allocate hours to work and leisure to maximize their utility given their wealth, earnings, time and other constraints. The solution to this problem of maximization can be characterized as consumption and leisure functions given relevant prices.

Under general conditions, it is possible to invert these functions to obtain prices and labour incomes as functions of consumed quantities and worked hours. In particular, the earnings obtained in this way (\( w^* \)) can be interpreted as marginal valuations of labour, which are a function of personal characteristics,

³⁸ Note that our methodology allowed us to control for composition effects of factors not subject to structure simulation. Composition effects are implicitly considered in the contribution of changes in working hours.
hours worked (amongst others) and represent the minimum wage for which the individual would work for a determined number of hours. On average, if the individual decides to work, the number of hours worked should be equal to their marginal value \( w^* \) with the wage effectively received. Conversely, an individual decides not to go to work if the marginal value is greater than the wage offered.

Consequently, our model consists of two equations; one for hourly earnings \( w^* \) and one for the number of worked hours \( H^* \). These equations are a function of exogenous vectors taken as given, affecting earnings \( (X_1) \) and hours of work \( (X_2) \), which are allowed to have elements in common. The equation for working hours includes composition variables, which will reflect in the simulated working hours, compositional changes, or in other words, changes between the relative size of sectors, occupations, etc.\(^{39}\)

Under this framework, the error terms \( \varepsilon_1 \) and \( \varepsilon_2 \) represent unobservable factors, which affect the determination of endogenous variables. In order to specify our model, for individual \( i \), we observe positive values for \( w^* \) and \( H^* \) only if the individual actually works; if not, we only know that the reservation wage is higher than the offered one:

\[
W_i^* = X_{1i} \beta + \varepsilon_{1i} \quad i = 1, ..., N \tag{6}
\]

\[
H_i^* = X_{2i} \lambda + \varepsilon_{2i} \tag{7}
\]

We then have the following observation rule:\(^{40}\)

\[
W_i = W_i^* \quad \text{if} \quad H_i^* > 0
\]

\[
W_i = 0 \quad \text{if} \quad H_i^* \leq 0
\]

\[
H_i = H_i^* \quad \text{if} \quad H_i^* > 0
\]

\[
H_i = 0 \quad \text{if} \quad H_i^* \leq 0
\]

Regarding estimation issues, we assume that the terms \( \varepsilon_1 \) and \( \varepsilon_2 \) are bivariate normal distributed with \( \text{E}(\varepsilon_{1i})=\text{E}(\varepsilon_{2i})=0 \) and variances \( \sigma_{12} \) and \( \sigma_{22} \) are correlated

\(^{39}\) Note that vector \( X_2 \) also contains variables indicating occupation, economic sector, regions, gender, wage work, current enrolment, marital status, employment status of other household members and urban/rural area.

\(^{40}\) Consistent with the data used for the estimation, observed wages for a nonworking individual are zero.
with correlation coefficient $\rho$. This specification corresponds to the Tobit type-3 model in Amemiya's classification.\(^{41}\) Even though it is possible to estimate all the parameters using a full information maximum likelihood method, we adopted a limited information approach that has notable computational advantages. We estimate the hours of work equation by means of a Tobit type-1 model in Amemiya’s classification in which the variable is observed only if it is positive. The parameters of interest can be estimated using a standard censored regression Tobit model.\(^{42}\) In order to control for behavioural responses within the household, each simulation of hourly earnings and working hours requires conditional estimations for spouses conditional on the behaviour of the head of household, and for other household members conditional on heads and spouses.\(^{43}\)

### 1.3.2 Returns to education

Figure 1.6 illustrates the evolution of the returns and relative supply of workers by educational levels and areas.\(^{44}\) Returns to schooling increased slightly between 1991 and 1994;\(^{45}\) however, between 1994 and 2005, returns to education declined substantially. Why did this trend take place?

Between 1991 and 1994, the demand for skills in rural areas outpaced the supply, which remained almost constant throughout this period. Consequently, the skill premium increased considerably during this period of real exchange rate devaluation. Subsequently, slowly rising supply (combined with stagnant or falling demand) appear to be driving the falling returns to education between 1995 and 2005. From 2005 onwards, returns to high levels of education increased even when a significant expansion of a higher level of education took place. In urban areas, the situation appears to be much simpler; declining returns are explained principally by the educational upgrade.

Looking at the results of the decomposition in Table 1.8, changes in the returns to education had an equalizing effect between 1991 and 2005 across the

---

41 See Amemiya (1985).

42 This strategy is consistent but not fully efficient. In any case, the efficiency loss is not necessarily significant for a small sample. Technical details about the estimation procedure are available upon request.

43 Each simulation represents a whole distribution of labour earnings; therefore, based on these simulated distributions, it is possible to obtain a variety of other inequality indexes. These can be provided upon request by the authors.

44 Returns are obtained from the Heckman ML wage regression (excluded category "without formal education").

45 This trend is also observed in Mexico; see López-Calva and Lustig (2010).
country. Then, the period between 2005 and 2007 is characterized by disequalizing returns in rural areas and (slightly) equalizing returns in urban areas. Why do we observe different patterns in urban and rural areas during this last period? We may find some explanation in the commodity boom mentioned before. The upsurge of the tradable sector (see Figure 1.3) could have increased the demand for skills in rural areas. However, we also need to study the impact of changing endowments to get a more complete picture.

1.3.3 Structure of education

The educational upgrading of the labour force may also have an impact on the distribution of earnings. For instance, there is evidence for Brazil, Mexico and Peru where improvements in the distribution of schooling attainment led to an equalization of the earnings distribution. However, as documented in Bourguignon, Ferreira and Lustig (2005), the equalization in years of schooling may yield in the short run to disequalize the income distribution (dubbed the 'paradox of progress').

Figure 1.6: Structure and returns to education, 1991-2007

López-Calva and Lustig (2010).
At least during the 1990s, we expect that the net flow of migrants from rural to urban areas disequalizes the urban distribution (see Table 1.3). Moreover, given the fact that in urban areas the educational upgrading is driven by an expanding tertiary education, we expect a strong disequalization due to changes in the structure of education. From 1999 onwards, a priori, it is difficult to predict a clear pattern regarding expected inequality changes. Even when the expansion of tertiary education speeds up, this effect is superseded by an extraordinary upgrading at the bottom of the distribution.

Table 1.8: Decompositions of the change in the Gini coefficient, labour earnings, selected periods

<table>
<thead>
<tr>
<th></th>
<th>Country level</th>
<th>Rural areas</th>
<th>Urban areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Returns</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Individual education</td>
<td>-1.35</td>
<td>-1.24</td>
<td>0.62</td>
</tr>
<tr>
<td>Household education</td>
<td>-0.34</td>
<td>-1.01</td>
<td>0.59</td>
</tr>
<tr>
<td>Experience (potential)</td>
<td>-0.69</td>
<td>0.80</td>
<td>-0.10</td>
</tr>
<tr>
<td>Sectoral occupation</td>
<td>0.36</td>
<td>2.42</td>
<td>-1.52</td>
</tr>
<tr>
<td>Other</td>
<td>0.20</td>
<td>0.48</td>
<td>-0.48</td>
</tr>
<tr>
<td>Endowment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Individual education</td>
<td>2.73</td>
<td>-0.75</td>
<td>-0.91</td>
</tr>
<tr>
<td>Household education</td>
<td>-0.11</td>
<td>-0.18</td>
<td>-0.01</td>
</tr>
<tr>
<td>Experience (potential)</td>
<td>-0.01</td>
<td>-0.04</td>
<td>-0.03</td>
</tr>
<tr>
<td>Population structure</td>
<td>-0.28</td>
<td>-0.42</td>
<td>-0.09</td>
</tr>
<tr>
<td>Unobservables (returns &amp; endowments)</td>
<td>3.35</td>
<td>3.43</td>
<td>-2.31</td>
</tr>
<tr>
<td>Hours of work, intensity</td>
<td>0.42</td>
<td>-2.72</td>
<td>1.14</td>
</tr>
<tr>
<td>Hours of work, employment</td>
<td>-0.91</td>
<td>1.68</td>
<td>0.84</td>
</tr>
<tr>
<td>Residual</td>
<td>0.35</td>
<td>0.03</td>
<td>0.26</td>
</tr>
<tr>
<td>Total Gini change</td>
<td>3.72</td>
<td>2.48</td>
<td>-1.99</td>
</tr>
</tbody>
</table>

Technical note: This table shows the average contribution to the observed Gini change produced by the observed change in each determinant. Averages come from changing the base year from t to t’ (two earnings simulations required). See Bourguignon and Ferreira (2005). See Klasen et al. (2012) for a technical description of the model specification.

Source: Authors’ calculations based on data from EPHPM I and EPHPM II.

In rural areas, structural changes are working in the opposite direction. While the expansion of tertiary education in rural areas is almost absent, improvements in the bottom tail of the skill distribution took place (albeit, slowly and insufficiently). Moreover, individuals placed on average at the extremes of
the skill distribution are more likely to migrate to urban areas (see Table 1.3).\footnote{In rural areas, the upper tail of the skill distribution corresponds to those with at least a secondary education.} Consequently, changes in the structure of rural education, including rural-urban migration, are expected to equalize the rural distribution of earnings.

Decomposition results in Table 1.8 confirm this. Changes in the structure of education in urban areas were strongly disequalizing during the 1990s and also dominated country-level changes. In rural areas, as expected, changes in the structure of education were strongly equalizing for all three periods.

With both education endowments and returns pointing towards equalization in rural areas, other factors must have dominated these trends to produce the drastic increase in labour income inequality during the period 1991-2005.

### 1.3.4 Returns by sectors and occupations as well as sectoral change

In Table 1.8, we grouped the inequality impact on the labour income distribution caused by changes in returns to different economic sectors and occupations.\footnote{We identify the following four sectors: agriculture and related sub-sectors; manufacturing; financing, communication and personal services; and other sectors. The occupations are: professionals and technicians; directors; office workers; agricultural workers; drivers; manufacturing workers; transport workers; and service workers.} The combination of sectors and occupations yield a rich labour market division in many “sector-occupations” of different scopes, with a great number of workers such as agricultural labourers and very small groups, such as, for example, management staff in agriculture. Conditional to education and other covariates, our results show that in rural areas, the change in returns per sector-occupation is the main inequality driver during the 1990s and one of the most important drivers between 1999 and 2005. This finding empirically confirms the assumption that the labour income distribution becomes more unequal due to the evolution of the inter-sectoral earnings-gap taking place across the whole ability distribution. It supports the predictions by Devillanova et al. (2010) that if moving costs and skills are correlated and there is capital-skill complementarity, a trade-induced sectoral shift would increase wage inequality between different skill levels in a sector and within skill levels across sectors.

By comparing two groups of workers from different sector-occupations, it can clearly be seen how returns for specific sector-occupations are driving disequalization. Consider the first group of agricultural workers with less than secondary education (including those who never attended school). They earned, in
real terms, 28 and 30 Lempiras per hour in 1991 and 1999, respectively. A second group of workers in the finance, communication and services sector, with more than secondary education earned 75 and 111 Lempiras per hour, for the same respective years. While the first group increased their real hourly earnings by 8% in eight years, the second group’s earnings increased by 48%. Note that the first group belongs typically to the more “traditional” agricultural sector, while the second group is part of the dynamic non-tradable sector.

In order to confirm the existence of a growing wage gap between the tradable and non-tradable sectors, we estimate hourly earnings for those with less than secondary education (including no school attendance). Returns to the tradable and the non-tradable sectors increased by 13% and 23% per hour, respectively, during the period 1991-1999. This means that, after controlling for education, working in the tradable sector makes a huge difference.

Table 1.8 also shows the impact of hours of work in different sectors and occupations (dubbed ‘employment’), effectively modelling the impact of sectoral and occupational change, as well as hours within a sector (dubbed ‘intensity’). The results show no clear and persistent trends in the country overall, or in urban and rural areas. This implies that inter-sectoral and occupational mobility has not been a major factor explaining inequality in labour earnings, supporting the claim of a relatively rigid labour market with little inter-sectoral mobility.

During the period 1991-1999, in rural areas the increasing demand for skills and the insufficient mobility of less-skilled workers determines an extraordinary dispersion of the returns across sectors and occupations. The fact that low-ability individuals in the expanding sector could work more intensively, can explain why changes in working hours help to partially compensate this disequalizing trend.49

Between 1999 and 2005, in rural areas the disequalization induced by changes in the returns to skills, sectors and occupations is reinforced by the impact of changes in the hours of work.50 This effect can be attributed to the increasing demand for skilled labour in the dynamic sector, given the imperfect labour immobility constraining less-skilled workers to escape from the declining tradable sector. Consequently, this sector demands disproportionately less working hours by unskilled workers inducing high levels of underemployment.

This effect can be attributed to the increasing demand for skilled labour in the dynamic sector, given the imperfect labour immobility constraining less-skilled workers to escape from the declining tradable sector. Consequently, this

49 This is due to the complementarity between the two types of labour (skilled and unskilled).
50 Returns to skill consist of returns to formal education and unobserved ability.
sector demands disproportionately less working hours by unskilled workers inducing high levels of underemployment.

1.3.5 Unobservables

Many characteristics of workers and circumstances cannot be observed. Our methodology allows us to control for omitted variables. Motivation, ethnicity and soft skills, amongst others, may be behind significant changes in the distribution of earnings. Some of these could be a direct consequence of unobserved differences in quality of education or technological change affecting demand for unobservable skills.

During the 1990s, a technological change took place in Honduras during the liberalization phase. Operating new technologies requires skills, but the supply of highly-skilled labour was very limited. In such an environment (and given the problems of the education system), skills may be less related to formal education than to the (unobserved) ability to adapt to these new work environments in the modern non-tradable (e.g. high-end services) sectors. Given this, if a growing proportion of the valuable skill endowment is unobserved, the impact of unobservables on inequality represents nothing different than increasing returns to unobserved skills and the intensification of their use. The fact that something is unobservable does not mean that it does not exist. Therefore, because much more than half of the variance in wage rates or weekly earnings is explained by unobserved characteristics, it is also not surprising that the same factors are extremely relevant in explaining changes in labour income inequality.

Our results in Table 1.8 confirm the disequalizing role of unobserved characteristics between 1991 and 2005, most importantly in rural areas. However, how do unobservable characteristics transform into an equalizing force between 2005 and 2007? We could speculate that the upsurge of the tradable sector, mainly based on agricultural (rural) supply, thinned out the inter-sector wage gap, reducing the price of non-observed (modern) skills and increasing relative returns of old-fashioned (traditional) formal education. An interesting hypothesis would be that, on the one hand, the tradable sector demands relatively more traditional skills, highly correlated with years of education; while, on the other hand, the non-tradable sector demands, for instance, higher levels of soft skills (mostly uncorrelated with the poor rural education). This hypothesis finds support in our results as the effect on inequality of education and the unobserved ability work in opposite directions. Therefore, increasing profitability gaps between the tradable and non-tradable sectors may also intensify the disequalizing power of unobservable characteristics, and vice versa.
In order to investigate this issue, the final analytical section presents a methodology to assess the role of the tradable and non-tradable earnings gap in explaining inequality changes of labour incomes.

1.4 Micro-econometric decomposition III: Linking the microeconomic evidence to the macroeconomic story

In this section, we present a model for linking findings from the microeconometric decomposition above with the macroeconomic story. Our central argument regarding macroeconomic events and inequality trends was that the effects of trade liberalization in the 1990s, combined with a large inflow of remittances and donor capital, in response to the destruction caused by natural disasters, led to a highly overvalued currency that depressed the tradable sector. Adverse commodity prices and the destruction caused by Hurricane Mitch further damaged the agricultural exports considerably. The story changes during the mid-2000s as a consequence of higher commodity prices recovering the highly depressed labour incomes in the tradable sector.

The concept behind our model is that there is underemployment in the tradable sector, and labour-market segmentation restricts the access to the predominantly modern non-tradable sector. Consequently, a earnings-gap between both sectors emerges, depending on relative labour demand conditions and levels of productivity. In the tradable sector, given adverse international market conditions - such as depressed commodity prices and overvalued exchange rates – it may not pay to increase productivity in this sector and labour incomes will stagnate. In contrast, the same conditions will increase earnings and revenues in the non-tradable sector of investments there, which are also favoured by the external environment.

In this model, we assume workers’ heterogeneity (allowing correlation between mobility costs and skills) causing an insufficient mobility of workers between tradable and non-tradable sectors (inducing a positive sloped non-tradable labour supply) and capital-skill complementarity. Therefore, different equilibrium labour incomes across sectors determine the observed earnings-gap between sectors. Note that this formulation is compatible with the model by Devillanova et al. (2010) which also relies on the complementarity between the two types of labour. The prediction of this formulation is that an economy suffering a sectoral shift against the backward sector will increase the inequality between and within sectors.
The key issue in this methodology is to decompose a distributional change of rural earnings (which is the sum of the tradable and non-tradable sectors) into two determinants. On the one hand, a “within-sector” determinant ($WS$), that is, a determinant of inequality changes which is not directly correlated with returns to the tradable and non-tradable sectors, and on the other hand, a “between-sector” determinant ($BS$) which captures inequality changes due to variations in the relative returns to the sectors (given a fixed structure of endowments, their returns and the sectoral employment shares).

The $BS$ determinant captures the effect of a structural change in key macroeconomic variables. Given the structure of endowments (observed and unobserved), their returns and the employment shares by sectors, this determinant reflects the direct contribution to inequality changes from “macroeconomic” variables, which may alter the relative sector competitiveness. For instance, a reduction of import barriers, an appreciation of the nominal exchange rate, an increasing public deficit, the non-adjustment of the obsolete or damaged export infrastructure and declining prices of commodities are only a few examples of institutional and market changes, partially driven by adverse climatic events, that can have an impact on the real exchange rate.

The impact of a change in the $BS$ determinant can be depicted as a horizontal shift of the tradable or non-tradable labour earnings density function. Consequently, the rural labour income distribution changes its shape even when the sectoral density functions do not experience any change in their respective shapes or weights. Based on this decomposition idea, we present a methodology for decomposing the distributional change in a structural macroeconomic $BS$ effect (earnings gap effect) and in a $WS$ effect, as a result of changes in endowments, returns and employment intensity (including those caused indirectly by macroeconomic changes, see below). More formally, we propose an Oaxaca-Blinder type of decomposition, which can be illustrated as follows:

$$\Delta D = D(WS', BS') - D(WD, BS)$$

51 Imagine that rural earnings are built-up by adding the tradable and non-tradable distributions. This determinant would reflect inequality changes that may arise by changes in the shapes and weights of both wage density functions.

52 The “between-sector” determinant captures inequality changes resulting from the horizontal shift of one or both wage density functions, keeping shapes and employment shares of the density function(s) constant.

53 However, such macroeconomic variables or events may also have an indirect contribution to inequality changes. This contribution works through affecting other relevant prices of the labour market. In this case, the indirect impact will be captured by the $WS$ determinant (changes in the shape and shares of the sectoral density functions).
where the second period is denoted by “ ’ ”. The distributional change may be decomposed sequentially as follows:

\[
\Delta D = \left[ D(WS', BS') - D(W'D, BS) \right] + \left[ D(WS', BS) - D(WD, BS) \right]
\]  (9)

Equation (9) indicates that the distributional change may be decomposed in an earnings gap effect (between sectors) in \( t' \) and a within sectors effect as in \( t \).\(^{54}\)

In order to perform the decomposition, we need to isolate the earnings gap change between sectors maintaining the shapes and employment shares of the sectoral earnings density functions constant. In other words, we need to find the maximal horizontal shift of the tradable labour income density function in \( t' \) which is consistent with the observed rural labour earnings density function in \( t \).

More precisely, while holding the position of the non-tradable earnings density function unchanged as in \( t' \) we need to find and isolate the horizontal shift of the tradable earnings density function (from \( t' \) to \( t \)) which combined then with the change in the shape and employment levels of both sectoral labour earnings density functions from \( t' \) to \( t \) consistently simulate the whole rural distribution in \( t \). or:

\[
g = \min \{|g(q)|, WS'\}
\]  (10)

... where \( g \) stands for quantile and \( g(q) \) is a function indicating the earnings gap change as a function of the quantile and \( WS' \) represents fixed endowments and returns in both sectors in \( t' \). If the gap change is positive, then the minimum earnings gap change will disequalize the distribution of rural earnings; however, if the gap change is negative, then the minimum earnings gap change will equalize the distribution. Even when the solution of the above minimization problem may yield closed-form first-order and second-order conditions, in the case of non-monotonic earnings gap change functions, we rely in a non-parametric technique to find the solution.

By calculating and constructing sectoral Pen's parades, it is possible to derive a growth incidence curve of the between-sector earnings gap \( g(q) \). Each Pen's parade is estimated for the tradable and non-tradable labour earnings distributions in \( t \) and \( t' \). Figure 1.7 is a representation of the mentioned growth incidence curve for the three periods analyzed. Once \( g \) in the equation (10) is derived, we shift the tradable distribution by adding \( g \) to the entire distribution of

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\(^{54}\) As we can see, there is no path dependence arising in this methodology. As \( \Delta D \) is observed, the decomposition only requires an estimation of \( D(WS', BS) \). The BS effect can be easily calculated estimating the first term in equation (9).
earnings in the tradable sector in \(t'\). Thus, we simulate \(D(WS', BS)\) in (9), which is the simulated rural distribution with returns, endowment and shares as in \(t'\) and the earnings gap as in \(t\). As we already know \((WD, BS)\), which is the observed rural distribution in \(t\), and \(D(WS', BS')\), which is the observed rural distribution in \(t'\), it is possible to estimate equation (9), and decompose labour income inequality changes as mentioned.

One should emphasize that this method is likely to underestimate the complete impact of macro conditions on the sectoral distribution of labour incomes. In particular, one can well imagine that the macro conditions that caused a favourable shift towards the non-tradable sector not only shifted the entire earnings distribution to the right but also affected different portions of the distribution differently. For example, the shift towards non-tradables and the adverse shift from tradables might have worsened the employment conditions of poorly paid agricultural workers more than better paid workers in the tradable sector. In that sense, our analysis probably represents a lower bound.

We can now examine to what extent the gap in earnings between the two sectors is actually driving changes in the labour earnings distribution. In Figure 1.7 below, we show changes in the earnings gap between the tradable and non-tradable sectors by quantiles of the earnings distribution in rural areas. While changes in the shapes of the curves are also a consequence of changing returns to skills and employment levels in the two sectors, the minimum vertical shift of the curves can be understood as the contribution of the general shift of conditions favouring the tradable vs. the non-tradable sector. Between 1991 and 2005, this shift increases, widening the gap between the two sectors; between 2005 and 2007, however, the gap is shrinking.\(^{55}\)

**Table 1.9:** The ‘macroeconomic’ (between sectors) earnings-gap effect on labour income inequality changes (using the Gini Index)

<table>
<thead>
<tr>
<th></th>
<th>Observed distributions</th>
<th>Simulation I sectors</th>
<th>Simulation II occupations</th>
<th>% of change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rural</td>
<td>Country</td>
<td>Rural</td>
<td>Country</td>
</tr>
<tr>
<td>1991</td>
<td>49.15</td>
<td>50.80</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>1999</td>
<td>55.13</td>
<td>54.52</td>
<td>54.95</td>
<td>54.24</td>
</tr>
<tr>
<td>2005</td>
<td>60.88</td>
<td>57.00</td>
<td>60.44</td>
<td>56.03</td>
</tr>
<tr>
<td>2007</td>
<td>55.88</td>
<td>55.01</td>
<td>56.50</td>
<td>55.68</td>
</tr>
</tbody>
</table>

Source: Authors’ calculations based on data from EPHPM I and EPHPM II.

\(^{55}\) Using the above methodology, \(g\) is equal to 0.43, 0.14 and -0.14 log points for the periods 1999-1991, 2005-1999 and 2007-2005, respectively.
Table 1.9 shows the (minimum) contribution to inequality changes as a result of an exogenous change in the earnings gap between the tradable and non-tradable sectors (Simulation I - sectors) and between the tradable and non-tradable occupations (Simulation II - occupations).\footnote{The tradable sector includes many occupations that are not directly related to trade activities (e.g. personnel transport in agriculture). On the other hand, tradable occupations include only occupations, which are directly related to trade activities (e.g. agricultural workers in the same sector). Here, the tradable occupation should narrowly reflect the consequences on inequality arising from changes in the relative Honduran export competitiveness.} As expected, the contribution to inequality changes of increasing conditional gaps being consistent with the observed inequality changes over time. In other words, given a structure of endowments, their returns and employment shares, an exogenous change favouring the non-tradable sector (occupation), yields to higher levels of labour earnings inequality and vice versa. Between 1991 and 1999, results show that the exogenous macroeconomic shift between the tradable and non-tradable sectors (occupation) explains a minimum of 7.5-14.5% of the observed disequalization at the country level, depending on the simulation.

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure1.jpg}
\caption{Growth incidence curves for the inter-sectoral earnings gap in rural areas}
\end{figure}
The contribution tends to be higher in the later periods contributing up to 50% of the disequalization between 1999 and 2005. However, many other intra-sectoral and inter-occupational gaps exist, which are not controlled for. In this sense, our results point out the disequalizing effect of other occupational sorting, some of which was indirectly induced exogenously by trade, but some that could be related to other shifts in demand for different types of labour within the sectors. This finding suggests that the shifts between tradable and non-tradable sectors, plus structural shifts that increase the demand for unobservables, combined with structural rigidities in labour markets that limit mobility, combine to drive up labour earnings inequality between 1991 and 2005. Note that the effects are larger at the country level than in rural areas as the rural income distribution is at the bottom of the overall country distribution and a widening of it has a larger proportionate effect on the overall country distribution. After 2005, the commodity boom seems to have reversed the tradable-non-tradable shift, but whether it is able to overcome the other structural causes of rising inequality, is hard to predict at present.

1.5 Conclusions and remaining challenges

In Honduras, increasing income inequality throughout the last two decades has mainly been a rural phenomenon, occurring within a context characterized by a fall in demand for tradables (linked to an overvalued exchange rate) trade-induced skill-biased technological change and a low labour mobility between a shrinking and increasingly less dynamic tradable sector and the more dynamic non-tradable sector. A lack of policies oriented towards the promotion of exports, an appreciated real exchange rate, increasing flows of capital and more recently, remittances after Hurricane Mitch, have contributed towards supporting a trade deficit, encouraged by a disappointing performance of the commodity exports (coffee during the 1990s and bananas during the 2000s). All these elements establish the framework, which helps to explain the inequality increase during the 1990s and the first part of the 2000s.

A variety of decomposition methodologies were used to understand the determinants and drivers of observed income inequality changes. First, we implemented an extended methodology proposed by Barros et al. (2006), finding that distributional changes in labour incomes are a strong determinant of inequality changes in the household per-capita income. However, between 2005 and 2007, the decrease in inequality is a consequence of equalizing trends in labour as well as non-labour income; for changes in non-labour income, remittances played a significantly equalizing role. However, HIPC debt relief and the resulting in-
creased social transfer policies of the Zelaya government played only a relatively small equalizing role.

Second, the use of a micro-econometric decomposition methodology, based on Bourguignon et al. (2005), helped to assess factors determining inequality changes in labour earnings between 1991 and 2007. Changes in unobservables (prices and endowments) and in the structure of education, together with a pronounced occupational sorting associated with an increasing productivity gap between the tradable and non-tradable sectors, represent the main drivers of the disequalization between 1991 and 2005. Regarding unobservable factors, it is plausible that the relative expansion of the non-agricultural sector during the 1990s, which demands a wider set of skills, is behind the extraordinary contribution of the unobservable to the increase in labour income inequality. Contrary to this, during the 2000s the equalizing contribution of changes in the structure of formal education, together with a recovery of the tradable sector - driven by favourable external conditions and improved export revenues - promoted equality by increasing earnings in the tradable sector, expressed as a reduction in the price to occupations (occupational sorting), and an equalizing impact of changes in unobservable factors on inequality.

We argue that the underlying determinant of the disequalization is the low mobility between sectors and occupations, where typically a poor agricultural worker is unable to abandon his sector and change to other sectors or occupations. As shown in our model, improvements in productivity tend to cancel the earnings-gap between the tradable and non-tradable sectors and also ensure higher labour income levels, while improvements in mobility between sectors leads to an accelerated decrease in this gap. We argue that the rising international competitiveness through policies promoting the productivity of the tradable sectors, at the expense of other sectors, increases the standard of living in the country, when compared with treating the other sectors equally.

Regarding the structure of education, and contrary to a general Latin American trend since the second half of the 1990s, where many countries were able to compensate the increasing negative impact of technological change in income inequality by having simultaneously achieved a more equal distribution of education, Honduras did not begin this compensation process until the mid-2000s. Additionally, we present evidence linking internal migration and labour income inequality changes. Based on a structural probability model, it was possible to estimate that the educational structure of migrants at the origin (1994), actually affects the structure of education in urban and rural areas. As a result, educational structure worsened in urban areas and improved in rural areas. Additionally, the impact of educational shifts in urban and rural areas at the country level are extremely disequalizing during the period between 1991 and 1999. Further-
more, a lack of income generation opportunities in rural areas - partly due to a depressed tradable sector - contributed to the formation of urban poverty ghettos encouraging high levels of criminality and prompting people to leave the country.

Our decomposition methodology supports the conclusions by Devillanova et al. (2010) suggesting a channel through which trade integration can affect the earnings inequality in a context of capital-skill complementarity and imperfect mobility of workers. The story that follows is that a shift towards the non-tradable sector increases the skill intensity and skill premium in this sector (observed and unobserved ability). This evolution regarding skill intensity and skill premium is backed up by our results regarding the impact of unobservables on inequality in a rural economy characterized by duality. At the same time, relative earnings for less-educated workers also increase in the dynamic sector compared to those in the tradable sector (due to the imperfect mobility). Consequently, skilled and unskilled workers now perform better in the non-tradable sector (relative to those in the tradable sector). In the same manner, the labour income distribution becomes more unequal due to the evolution of the inter-sectoral earnings gap taking place across the whole ability distribution. However, an important proportion of the inequality increases and resulting equalization in the earning distribution cannot be attributed to labour-market forces, but rather to changes in the relative competitiveness coming exclusively from macroeconomic conditions.

Given the fact that inequality is partly a consequence of declining rural tradable earnings and inter-sectoral and inter-occupation immobility, policies oriented towards increasing labour force mobility and productivity, together with encouraging the competitiveness of the tradable sector are highly recommended in order to achieve desirable social-economic outputs. Given that almost 80% of the extremely poor live in rural areas, most of them working in the agricultural sector, it is critical to increase smallholder competitiveness, including export promotion policies, an adjustment of the real exchange rate and investments in rural infrastructure. However, a more promising step towards increasing rural earnings equity in the long-run is to provide a non-segmented education with productive and non-discriminatory values in rural areas that reduces the friction costs associated to internal migration (between sectors, occupations, and geographic regions).

The observed decrease in inequality between 2005 and 2007 should not be misunderstood as an already guaranteed change from the previous disequalizing trend. The evolution of inequality will depend heavily on the impact of the current international crisis, commodity prices and the flow of remittances. Even if social policies have so far shown only a neutral impact on inequality, they
should be reinforced, since their possible success offers a limited set of tools to partly overcome the purely exogenous character of inequality trends so far.