

DISCUSSION PAPER SERIES

IZA DP No. 12256

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Developed Countries:  
The Role of the Sectoral Composition of  
Production**

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## ABSTRACT

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# Youth Labour Markets in Developing and Developed Countries: The Role of the Sectoral Composition of Production\*

In this paper we explore the role of the sectoral composition of gross domestic product (GDP) in explaining the behaviour of youth labour markets. We provide a comparison of the behaviour of youth unemployment rates, employment-population rates, and labour force participation rates between developing countries and developed (rich) countries. In developing countries, open unemployment is less of a problem: the major problem faced by young people is employment in the informal sector that is poorly paid, intermittent, and insecure. A major part of employment in developing countries consists of “vulnerable employment”. After a brief review of the literature, the paper uses panel data to estimate equations for unemployment rates, employment-population rates, and labour force participation rates for youths. We find that the sectoral composition of production and aggregate demand are important in explaining the behaviour of youth labour markets.

**JEL Classification:** O11, J21, J46, O17

**Keywords:** youth labour markets, sectoral composition, informal employment

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# Youth Labour Markets in Developing and Developed Countries<sup>1</sup>

**P.N. (Raja) Junankar**

## **1. Introduction**

In this paper we explore the role of the sectoral composition of gross domestic product (GDP) in explaining the behaviour of youth labour markets. We provide a comparison of the behaviour of youth unemployment rates, employment-population rates, and labour force participation rates between developing countries and developed (rich) countries. In developing countries, open unemployment is less of a problem: the major problem faced by young people is employment in the informal sector that is poorly paid, intermittent, and insecure. A major part of employment in developing countries consists of “vulnerable employment”. After a brief review of the literature, the paper uses panel data to estimate equations for unemployment rates, employment-population rates, and labour force participation rates for youths. We find that the sectoral composition of production and aggregate demand are important factors in explaining the behaviour of youth labour markets.

In any study of youth labour markets, we have to consider the history and development of that country. In many countries that had been colonised by the Western powers their economies had been transformed into either single crop or single mineral resource economies. Most employees in these industries were simply unskilled workers. As these activities were often for exports to the colonial powers they would invest in infrastructure (roads, railways, ports etc.) which would hire unskilled workers. Some countries were “lucky” that were simply producing oil and they were able to earn large amounts of foreign exchange. However, oil production was mainly capital-intensive and did not help to develop the labour market. After independence many countries that were short of foreign exchange introduced import- substituting policies to develop their industrial sector. In most Less Developed Countries (LDCs)<sup>2</sup> youths work in the

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<sup>1</sup> This paper is a revised version of a report produced for the International Labour Organisation under the guidance of Shane Niall O’Higgins. I am grateful to Sophie Yan and Taneem Muzaffar for help with the estimations carried out in STATA. I am grateful to an ILO Statistician, Francesca Bonomelli, who very kindly tabulated some of the results from the School to Work Transition Surveys, SWTS, and provided me with the data. I am grateful for helpful comments from Geoff Harcourt and Peter Kriesler.

<sup>2</sup> At one time these countries were called “underdeveloped”, then they became “less developed countries” (LDCs), “developing countries”, and now the popular term is “emerging economies”.

informal sector. Most young people are working in the agricultural sector that does not require high educational levels or high skills since most of the work is using old-fashioned technology. Most of the young in poor countries have limited education and there are very few employment possibilities for them. As the economy develops some of them escape (migrate) from the rural sector and move into informal jobs in the urban/industrial sector. Eventually, some of them after a period of time may be successful in moving into better paid and secure formal sector employment.

In the process of development, the economy transforms from a mainly agricultural economy to an industrial economy and then as it develops further the services sector becomes dominant. Note, that India appears to have moved from a mainly agricultural economy to a higher concentration in services, rather than in the industrial sector. However, in the early stages of development when markets are not well developed much of the economic activity takes place in informal markets: wage labour is a very minor part of the economy. Much of the work that takes place is in family farms or family run micro enterprises (small businesses like selling cigarettes, tea etc. in little street stalls). Some of the former colonial countries have a significant resource industry that employs wage labour and produces mainly for the export market.

The concepts of employment and unemployment are more easily defined for a developed capitalist economy that has a market for wage labour. Following the International Labour Organisation (ILO) definitions, employment is defined as working for at least one hour a week for some payment, either for a wage or for profit, or commission, or without pay in a family business. However, this definition usually excludes people (mainly women and young children) who provide unpaid household or farming services. Unemployment is defined in terms of not being employed for pay or profit for one hour or more in a week, being available to begin work, and actively searching for work. Most developed countries carry out regular labour force surveys that provide statisticians with the data on employment and unemployment. However, labour force surveys in developing countries are unusual and infrequent. Hence the data for LDCs are limited and should be treated with caution.

In most developed countries the government provides unemployment benefits subject to several conditions that the unemployed job seeker is actively searching for work. The more generous these unemployment benefits, and the longer the duration these benefits are available, the greater the likelihood that unemployed workers would access these benefits and continue searching for work. Of course, if a person has just been laid off and s/he expects to find work

easily and quickly (say when the labour market is very tight) s/he may not access unemployment benefits and may even take a short holiday and would therefore not be considered as unemployed.

In Less Developed Countries (LDCs), where wage labour is not a predominant form of employment, many people are employed in agriculture in family farms or work in the informal markets (e.g. selling cigarettes, newspapers, etc. on street corners). In the urban areas of poor countries where the formal labour market is limited to perhaps the manufacturing sector, there are many people who are eking out a living in a variety of activities, some legal (and some not), it is not clear who is employed or not. Many of the migrants who arrive from rural areas are often waiting for a job in the formal sector while they are carrying out activities in the informal sector. In most of the poor countries we find that many children are working for their family (in agriculture or in family owned activities like shops etc.) As such, the usual western definitions of the working age population as people of ages between (say) fifteen and sixty five is meaningless for LDCs. In much of the statistical data that are available, the employment data are usually measured or estimated for people between fifteen and sixty five, although the real employment data should include children who are employed. There are, of course, estimates made for employment of children, but these data are likely to be unreliable.

The concept of unemployment in LDCs becomes ‘fuzzy’: the line between employment in the informal sector and unemployment is not clearly defined (Turnham, 1993). Some of the people who are working in the informal sector could be conceived of as “wait unemployed”<sup>3</sup>. In developed economies people may not “look for work” when there are no obvious vacancies available and drop out of the labour force (the discouraged workers) and the participation rate may fall. Since the concept of unemployment may not be well defined labour economists sometimes use the concept of employment–population ratios or labour force participation rates (the sum of employed plus the unemployed as a proportion of the population of working age). Even employment is not a clearly defined concept in LDCs as many people are working on a family farm, or family micro enterprise without a formal agreement about wages or employment. Again, it should be noted that in LDCs many children are effectively in the workforce, but there are no regular surveys that provide information for this group.

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<sup>3</sup> ILO (2015) also argues that the concept of unemployment is not well defined for developing countries, “...the strict unemployment rate has less meaning in lower-income countries”. (p. 31).

It should be noted that social customs, culture, institutions, tax and welfare systems, and the legal framework play a large part in the participation rates of (especially) women and children. In LDCs where compulsory school education is either non-existent or not enforced children are part of the labour force. In many developed countries there has been an increase in people engaging in higher education and hence lowering the participation rate in the labour force. In certain cultures where religion plays an important role, women do not engage in paid work and hence are not part of the labour force. In many developed countries more and more women have increased their participation rate as there has been an increase in society's attitudes to women working in the paid work force. The women's liberation movement of the 1960s in the Western world clearly played an important role in providing women with a more important role in the world of work and in society in general. Hence, comparisons of employment, unemployment, participation rates across different countries should be made with some caution.

Employment, unemployment, and labour force participation rates depend on both the demand for labour, the supply of labour, and the functioning of the labour market. In standard neoclassical economics, wages play an important role in determining both the demand and supply of labour, although as discussed above they are conditioned by social, cultural, and institutional features of societies. In traditional economics, minimum wage legislation influences labour demand and leads to unemployment, although there is now increasing evidence to reject this hypothesis.

This project investigates the role of different sectors of the economy in affecting these labour market variables. Table 1 presents data on the shares of employment in different sectors for High, Middle, and Low Income Countries. It shows clearly that the share of employment in Agriculture has declined for all these countries, but the shares are very high for Low Income Countries (68 % in 2017) and almost negligible for the High Income Countries (3 % in 2017). In contrast, the services sector had increased for all groups, while the Industrial sector has declined in the High Income countries, more-or-less constant in the Middle Income countries, but increasing in the Low Income countries from 8 % in 1991 to 10 % in 2017. Unfortunately, these data are not available in the World Development Indicators data set for youths.

**Table 1: Sectoral Employment by Income Groups**

	<b>1991</b>	<b>1995</b>	<b>2000</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2017</b>
<b>HIC Agri Emp (%)</b>	6.62	5.74	4.62	3.96	3.46	3.14	3.06
<b>MIC Agri Emp (%)</b>	50.98	47.82	44.84	39.48	33.39	28.45	27.25
<b>LIC Agri Emp (%)</b>	75.31	76.06	74.18	72.67	70.01	67.87	67.61
<b>HIC Inds Emp (%)</b>	31.08	28.77	27.14	25.06	23.17	22.81	22.73
<b>MIC Inds Emp (%)</b>	22.05	22.55	21.93	23.31	24.33	24.08	23.84
<b>LIC Inds Emp (%)</b>	8.21	8.01	8.71	8.87	9.46	10.34	10.34
<b>HIC Services Emp (%)</b>	62.30	65.49	68.24	70.98	73.37	74.05	74.22
<b>MIC Services Emp (%)</b>	26.97	29.63	33.24	37.22	42.28	47.47	48.91
<b>LIC Services Emp (%)</b>	16.48	15.92	17.11	18.46	20.54	21.79	22.05

*Source:* World Development Indicators

Although it would be important to study the role of wages in influencing the levels of labour force participation and employment, these time series data are not available for most countries. As discussed above, in many poorer societies agriculture has a dominant role and employment in that sector is often based on family labour or on hiring casual labour at peak seasons like sowing and harvesting. The industrial sector (often dominated by large multinational corporations), and the public-sector employ workers in the formal sector. These jobs are often called decent jobs as they have good pay, holiday leave, unemployment and redundancy benefits, etc. However, many of the people working in the industrial sector could be employed as casual workers without access to fringe benefits (informal labour in the formal sector). In many developed countries, there has been a growth in outsourcing of many production activities to contractors, so that the workers in these activities are in effect, cheap labour, or informal workers in the formal sector. As societies have developed, production has moved away from agriculture towards the industrial sector. Typically, the agricultural sector is a low productivity sector that uses (especially in poor economies) labour-intensive methods while the industrial sector is a high productivity sector that uses capital intensive production techniques. Hence, a move away from agriculture to industry may increase productivity and the level of Gross Domestic Product (GDP), but may not necessarily lead to an increase in employment overall, see Junankar (2013).

In this study, we compare changes in employment, labour force participation, and unemployment in different sets of countries: the main aim of this research was to study the role

of the sectoral composition of GDP in influencing the labour market for youths. In our econometric analysis we control for these different sets of countries (by income levels as defined by the World Bank) by estimating separate equations for different groups of countries (subject to data availability). Our explanatory variables include the share of Agriculture in GDP, the share of Industry in GDP, the share of investment in GDP, the per capita level of GDP, and the growth rate of GDP. Besides the sectoral composition of GDP, we postulate that the share of investment in GDP increases the level of aggregate demand in the economy and hence leads to an increase in labour force participation and in the employment rate, and a decrease in the unemployment rate. The per capita level of GDP is both an index of the general well-being of the country and hence an index of the level of aggregate demand. It is also a proxy for the level of wages, as we would expect wages to be positively related to per capita GDP.

These data are from the World Bank World Development Indicators data set. Our concern in this paper is to study the importance of different sectors of the economy in explaining the levels of employment and unemployment. Unfortunately, we do not have reasonable data for sub-sectors like health and education services, manufacturing, resources, etc. and have had to rely on broad economic aggregates as listed above. Again, there are no data on wage rates that cover all these countries, although as mentioned above, per capita GDP is a proxy for the level of wages in an economy. Ideally, we would like data on the value of output of the “informal sector” and the “formal” sector, but these data are not available. As we note, the data on employment and unemployment are not easily available for a large number of the poorer countries, and hence our econometric analysis is severely limited by data availability.

As we show, in developing countries youths are often employed in the informal labour market under poor conditions of work and pay. Most of them are working as casual, temporary, unpaid family workers, or in own-account work. The main problem facing youths in developing countries is not unemployment but vulnerable employment<sup>4</sup> in the informal labour market. Since the global crisis there has been an increasing problem of youth unemployment especially in the OECD and the Middle East and North Africa. The main aim of policy needs to provide decent jobs for young people.

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<sup>4</sup> Vulnerable employment is defined as the sum of contributing family workers and own-account workers.

## 2. Literature Review

There is a large research literature on youth labour markets in general, and youth unemployment in particular. Many of the European OECD countries have faced a massive increase in youth unemployment and long-term unemployment (Junankar, 2011, 2015). A common feature of this literature is the social impact of youth unemployment. When young people are unemployed they may face various problems, including heightened levels of social alienation and depression, and an increase in the use of non-prescribed drugs, petty crime, and suicide rates (Eurofound, 2014). In addition, a spell of unemployment has a “scarring effect”: it has a negative impact on the possibilities of finding another job as well as leading to lower future earnings. High youth unemployment is often linked to social and political unrest, for example, in the so-called “Arab Spring” revolts in the Middle East.

In the formal economics literature, youth employment (unemployment) is determined by the demand for, and supply of youth labour. *Ceteris paribus*, an increase in the supply of labour leads to an increase in youth unemployment. In many developing countries there has been a demographic bulge in youths which has led to an increasing problem of finding employment for this growing youth population. The supply of youth labour is clearly determined by the size of youth population, but also by the social, cultural and economic *mores* that determine whether young people remain in education (secondary or tertiary), whether females enter the labour market (for religious or cultural reasons many females in Arab and Muslim countries may not enter the labour market). Youth labour supply (in formal economic theory) also depends on the available wage rate, the higher is the wage rate the higher is the youth labour supply. Labour demand depends on the level of demand for the products, the technology being used in the production process, and the wage that has to be paid. In general, the technology used in larger firms is a capital-intensive technology and hence the demand for labour is relatively low.

Employment depends on the sectors that are expanding: if the economies depend on resource sectors (oil, mining, etc.) that are very capital-intensive sectors, employment does not expand significantly, Pieters (2013). In the agricultural sector, employment depends to some extent on the distribution of land between owners and cultivators. If there are many tenant farmers they are less likely to invest in hiring labour for land improvement. If farm sizes are small they are unable to benefit from economies of scale and hence employment may be lower. Much of employment in agriculture is on family farms or based on casual employment in peak periods. In LDCs the industrial sector is usually limited and often dominated by large multinational

firms that use capital-intensive technology. Much of industry in LDCs depends on small family run enterprises (so-called micro enterprises) that belong to the informal sector.

In the economics literature there has been a continuing debate about the impact of minimum wages on (youth) unemployment, with the traditional view assuming competitive labour markets where it is argued that minimum wages lead to unemployment. However, in recent years a growing number of economists have argued that in imperfect markets, minimum wages do not lead to increased unemployment (Card and Krueger, 1995; Manning, 2003, 2010; Booth, 2014). They argue that the labour market is not perfectly competitive but that employers have market power in wage setting (monopsony). There is asymmetric information in the labour market, workers have heterogeneous preferences, and so on, all of which make the labour market behave differently from a competitive market. Manning (2003, 2010) has shown that in such markets employment can increase with an increase in wage rates.

The controversy on the impact of minimum wages on unemployment was kindled by the work of Card and Krueger (1994, 1995) which was followed by several critiques by (amongst others) Neumark and Wascher (2007). The international evidence is mixed with recent studies by Dube et al. (2010) for the USA showing that there is no evidence for the ‘disemployment’ (*sic*) effects of minimum wages. Dube (2011) in a book review of Neumark and Wascher (2008) argues that the evidence provided for such effects is selective and that “[D]ynamic specifications show that the measured disemployment (*sic*) in the state panel models tend to occur before (and sometimes many years before) the minimum wage increases’(p. 763). A recent report by the OECD (2015) also argues that a minimum wage does not necessarily lead to a fall in employment and is necessary to lower inequality of incomes. In a recent report (see Amlinger et al. 2016) there is evidence that an increase in the minimum wage in Germany did not lead to a decrease in employment but did lead to increased wages.

In 1999, Britain introduced a national minimum wage (NMW). The impact of this national minimum wage has been studied by several economists. David Metcalf (2008) for example shows that the NMW did increase wages but there is no evidence to show that it led to a fall in employment. He argues that a minimum wage rise could increase labour supply and the increased wages (via efficiency wages) could increase productivity.<sup>5</sup>

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<sup>5</sup> Recently, over 600 economists signed a letter in support of an increase in minimum wages in the US, see Economic Policy Institute (2014).

Much of this literature discussed above for OECD countries is based on high income countries where there is a well-developed labour market, unemployment benefits are available, and although there has been an increase in vulnerable employment, most of the workers are part of a formal labour market.

Human capital plays an important role in the labour market. In general, the better educated youths are more likely to find employment as they are more productive workers. In the OECD the probability of finding employment is significantly affected by the level of education: better educated people are more likely to find a job and get higher wages. However, in LDCs the more educated youths typically come from better off families and are less likely to work in the informal sector: they would rather wait to find employment in a well-paid job in the formal sector while being supported by their parents.

Although there is a large literature that describes the problems of youth labour markets in developing countries, there is a limited amount of econometric estimation of youth employment and unemployment in LDCs<sup>6</sup>. As discussed above, there is a large informal labour market and a large proportion of workers are in “vulnerable employment”. In this kind of labour market, the concept of unemployment is not clearly defined. In poor countries, unemployment is more likely for people in urban areas and even young people with higher education find it difficult to find employment. There is a literature that argues that in poor countries you have to come from a well-off family to be unemployed as the family would support the unemployed youth. Unemployment, it is argued, is a luxury that the poor cannot afford. The less well-off do not have a choice: if they cannot find a formal sector job they enter the informal labour market.

In a paper (written as a background paper for the *World Development Report 2013*) Arias-Vazquez et al. (2013) provide an interesting account of “The Role of Sectoral Growth Patterns in Labor Market Development”<sup>7</sup>. They point out that in developing countries there are large and persistent wage differentials between different sectors of the economy and a large proportion of workers are “employed” in low productivity agricultural activities. For these countries to develop, the structure of the economy has to be transformed from the low productivity agricultural sector to a high productive (and technologically advanced and dynamic) manufacturing sector. They present a graph of the employment-population ratio

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<sup>6</sup> See Filmer and Fox (2014) for a discussion about Sub-Saharan Africa, and ILO (2015).

<sup>7</sup> Also see Salter (1960) and Kaldor (1967, 1996) for the importance of structural change and economic development.

against GDP per capita (using smoothed data) which appears as a U-shaped curve such that as GDP per capita rises, first the employment-population ratio falls and then after a point rises. An analogous graph for the unemployment rate has an upside-down U-shaped curve. In the next section, we show that in general there appears to be a negative relation between the employment-population ratio and GDP per capita, when we look at groups of countries by income level.

In general, it is argued that the growth of labour-intensive sectors like agriculture and manufacturing are more likely to lead to a growth of employment. However, the results differ depending on the levels of income of the groups of countries under study. They also find that when they study longer runs of data, there is little evidence for differential employment effects of growth across sectors.

Arias-Vazquez et al. (2013) estimate panel regressions (for 184 surveys on a set of 81 countries) for annualised changes in employment on weighted growth rates of output of different sectors, where the weights are the share of that sector in GDP. They compare the effects of high labour productivity sectors (manufacturing, transport and communications, finance, electricity and utilities, and mining) with low labour productivity sectors (other services, agriculture, retail and wholesale trade, government and public administration<sup>8</sup>, and construction) on employment growth. They also carried out panel regressions on individual (unit record) data for Brazil, Indonesia and Mexico. They test for differences in the impact between high labour productivity and low labour productivity sectors on annual growth of employment. They also test for export-led growth on annualised changes in employment.

In the cross-country regressions for employment growth (see their Table 2) they find a negative and significant coefficient for high productivity sectors and a positive but insignificant coefficient for low productivity sectors. For changes in unemployment (presumably the change in unemployment numbers, not changes in unemployment rates) they find a negative and significant coefficient for low productivity growth sectors and an insignificant coefficient for high productivity sectors. Their estimated coefficients (they argue) show that low productivity growth sectors lead to faster employment growth and reductions in unemployment. However, unless there are typographical errors, the coefficient on high productivity sectors is *negative* and significant while that on low productivity sectors is positive and insignificant (with a large

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<sup>8</sup> I am not sure how government and public administration are estimated to be low productivity sectors, since it is difficult to measure the output of this sector. It is certainly labour-intensive.

standard error). *In other words, their results show that growth of high productivity sectors is inimical to employment growth*, but low productivity sectors have no influence on employment growth.

For changes in unemployment, the coefficient on high productivity growth is positive and insignificant while the coefficient on low productivity sectors is negative and significant. In other words, the faster is the growth of low productivity sectors the smaller are the changes in unemployment. Low productivity sector growth is good for lowering unemployment. The authors then test for a statistical difference between the coefficients for the employment equation and find that at the *ten percent* level there is a statistical difference and then argue that this implies that “low productivity growth leads to faster employment growth than does high productivity growth” (p. 9). However, all that the test shows is that a statistically significant negative coefficient is statistically different from a coefficient that is (essentially) zero! For the unemployment equation, they find a statistically significant difference between the two coefficients, which is not surprising since the coefficient on high productivity sectors is essentially zero! They also compare differences in the not-in-the-labour-force and differences of wages and productivity, where most parameters are insignificant<sup>9</sup>. It should also be noted that the sample of 184 surveys for 81 countries means that they have just over two observations for each country, but their Table 2 shows they have 193 observations. If they use annual changes on employment and unemployment, at most they would have 81 annual changes<sup>10</sup>. Given such a small sample, these results need to be treated with extreme caution.

The case studies carried out by Arias-Vazquez et al. (2013) find results that are sometimes contradictory to the panel estimates and depend on the institutional and structural features of the economies. For Brazil there are no significant differences between the high and low productivity sectors. For Indonesia it appears that the high productivity sector growth is more effective in reducing employment than growth in low productivity sectors. Mexico has similar results. In some further detailed cross country analyses they find negative effects of growth in mining and utilities on employment growth.

Some work by Junankar (2013) found that there was a trade-off between productivity growth and employment growth: countries whose productivity was growing faster had slower growth

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<sup>9</sup> They do acknowledge for the wages and productivity equations that “the coefficients are imprecisely estimated and the differences between coefficients are not statistically significant”.

<sup>10</sup> This is very puzzling and needs to be investigated further.

of employment. For many less developed countries, agriculture is a dominant sector in terms of the share of GDP produced and in terms of the share of employment. Research on poverty reduction by Loayza and Raddatz (2010) suggests that growth in agriculture, construction, and manufacturing sectors are more likely to reduce poverty by increasing employment. McMillan and Rodrik (2012) found that many Low and Middle income economies suffered from a “resource curse” such that although the economy is growing employment does not grow. That is countries that discovered (for example) oil fields in Brazil had disappointing employment growth.

Recent papers have studied the impact of the global crisis on youth labour markets, For example, see O’Higgins (2010), Marcus and Gavrilovic (2010), Overseas Development Institute (2010), FRB (2014), and Junankar (2015) who show the significant impact on youth labour markets of the global crisis. Matsumoto et al. (2012) provide a macroeconomic analysis of the youth employment crisis. As they point out the major limitation for employment of youth is the lack of aggregate demand. In particular, they argue that the big increase in youth unemployment (in high income countries) since the Global Crisis was exacerbated by the “austerity” policies introduced by various governments. They show that youth unemployment is not due to a lack of skills or educational levels since youths in low and middle income countries cannot afford to be unemployed. In fact, those with higher levels of education, who come from privileged socio-economic groups are more likely to be unemployed as they can afford to be unemployed. Similarly, they argue that during a recession youths with fewer skills are likely to be laid off and then during a recovery they are the last to be hired. In reviewing studies of the impact of labour market flexibility on youth unemployment they state that “the evidence of the impact of employment protection legislation on employment is rather weak and mixed”. (p. 10) In an econometric study (using Seemingly Unrelated Regression Estimation on a pooled data set) they find that the main explanatory variables are demand related factors like the adult unemployment rate (proxy for aggregate demand) and investment as a share of GDP. Interestingly, these results are similar for high income and low and middle-income countries. They argue that access to finance is a key factor in doing business in high, middle, and low income countries.

### **3. Some Descriptive Statistics**

In this section we present some aggregative statistics to provide a global view of developments in the youth labour market. As discussed in the introduction, we should expect to see significant

differences between groups of countries with different levels of income and countries from different regions. In this section we look at the Employment-Population ratios (Emp-Pop), Labour Force Participation Rates (LFPRs), Vulnerable Employment Rates, and Youth Unemployment Rates (YURs) of different groups of countries<sup>11</sup>. Remembering that for poor countries the concept of employment and unemployment is problematic, we note that these broad aggregate data only provide some indications of the developments in these countries. *The data on employment, labour force participation, and unemployment in LDCs that are produced by the International Labour Office (ILO) include informal employment.* This is worth noting in the following discussions.

Figures 1, 2, 3, and 4 present changes in labour markets for High, Middle, and Low Income countries. Figure 1 shows that since educational opportunities are limited (and people have to work to survive) for young people living in poor countries, their Employment-Population ratios are significantly higher than for Middle or High Income countries. Further, as there has been an increasing participation in education levels over time (both at the upper secondary levels and higher education levels) we see that there was a continuing decline in Employment-Population ratios throughout the period from 1990<sup>12</sup>. This is especially significant for Middle Income Countries where the fall in Employment-Population Rates are dramatic: for males (females) falling from 61 % (43 %) in 1991 to 44 % (26 %) in 2017. This is probably due to the increasing numbers in educational facilities in Middle Income countries and hence decreasing the employment-population rates. What is interesting to note is that the Global Crisis of 2007-8 led to a significant fall in this ratio for the High Income countries, but only a very gentle decrease for the other groups of countries. For all these income groups, male employment-population rates are higher than that for females.

Figure 2 shows similar trends for the Labour Force Participation Rates (LFPR) with a significant fall after the Global Crisis for the High Income countries, and a gentle fall for the Middle Income and Low Income countries. Again, male LFPRs are higher than for females for

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<sup>11</sup> Ideally, we should look at data on those young people who are “not in employment, education, or training” (NEET) as being a better measure of those people who are really unemployed. But if the employed include, as it would in terms of the ILO definition, those who are working for pay or profit in the informal sector then the NEET estimates would be underestimates. Many of those people working in the informal sector are either underutilised or disguised unemployed. In any case, it is difficult to find data on NEETs for most developing countries.

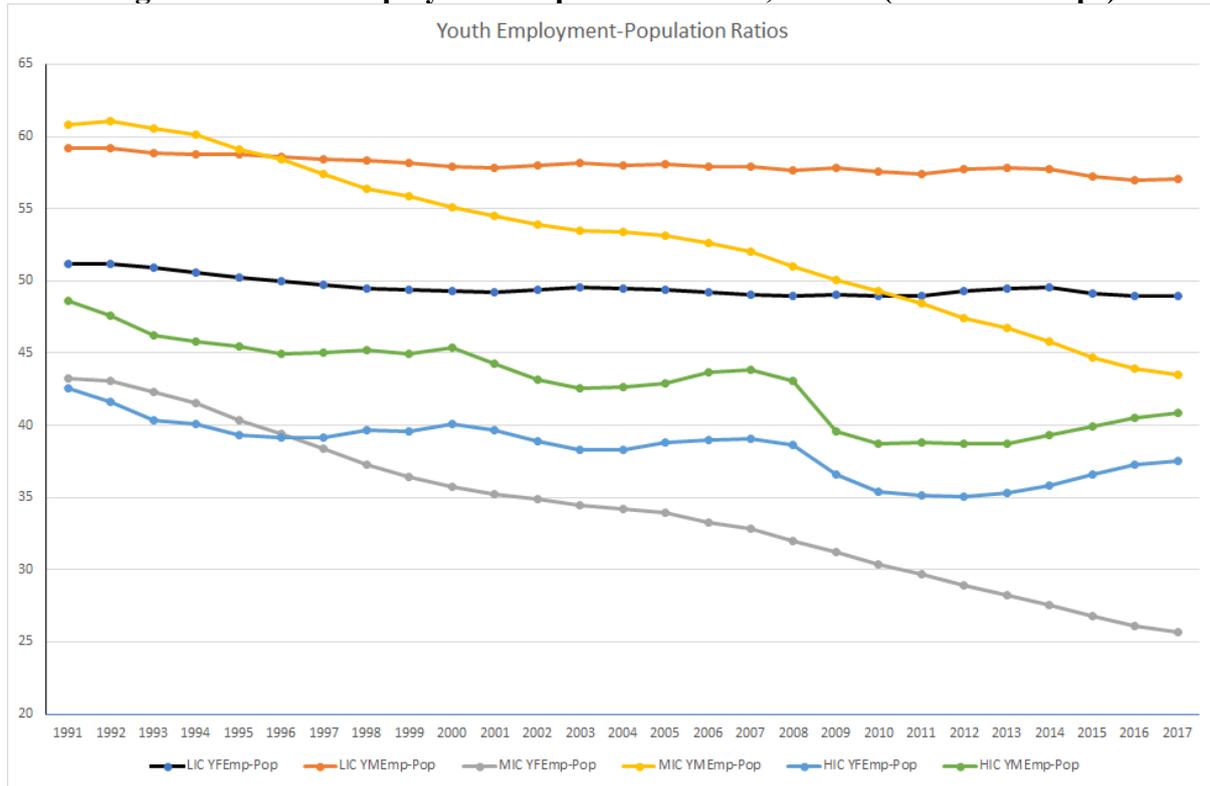
<sup>12</sup> See ILO (2015) *Global Employment for Youths 2015* which states that the “[E]ducational attainment continues to increase ... and is a principal factor behind the long term declining trend in youth labour force participation.” (p. 3). It also stresses that educational attainment is not a sufficient condition to get paid employment, only tertiary education helps.

all these income groups. Figure 3 is interesting in that it shows the marked changes in Youth Unemployment Rates (YUR) with the business cycle for High Income countries. In particular, there is a big jump in YUR with the onset of the Global Crisis, while there is a less marked increase for Middle Income countries, and an almost negligible increase for Low Income countries. Interestingly, female unemployment rates are higher than male unemployment rates for these income groups, although for the High Income group for a short period after the crisis male unemployment rates exceeded the female rates. It is also clear that youth unemployment rates in Low Income countries are significantly lower than in Middle or High Income *countries*. As discussed earlier, unemployment is a luxury that poor people cannot afford<sup>13</sup>. Figure 4 shows that Vulnerable Employment Rates are much higher for Low and Middle Income countries compared to High Income countries. Although there was a gentle decline in Vulnerable Employment Rates over time, the decline was negligible for Low Income Countries. What is also noticeable is that female vulnerable employment rates are higher than male rates.

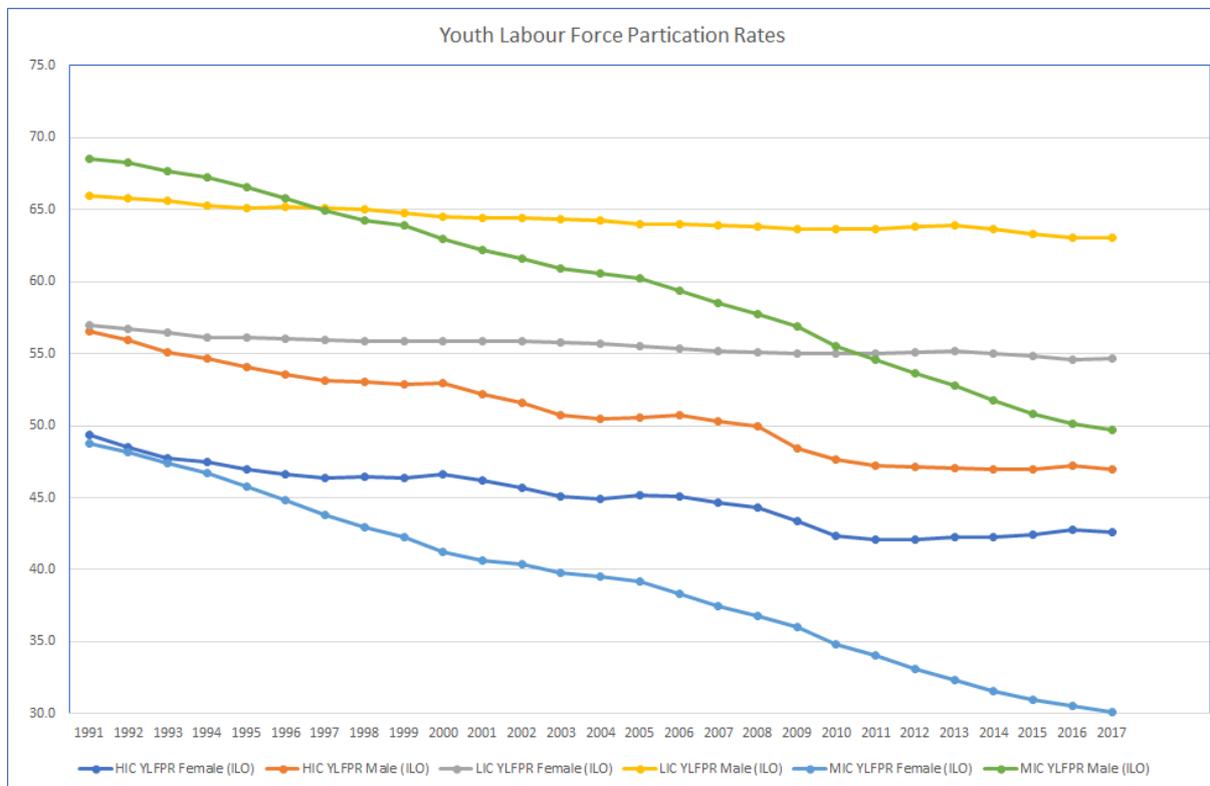
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<sup>13</sup> Although, not shown in these Figures, Youth Unemployment Rates are always at least double the Adult Unemployment Rates. See Appendix 1.

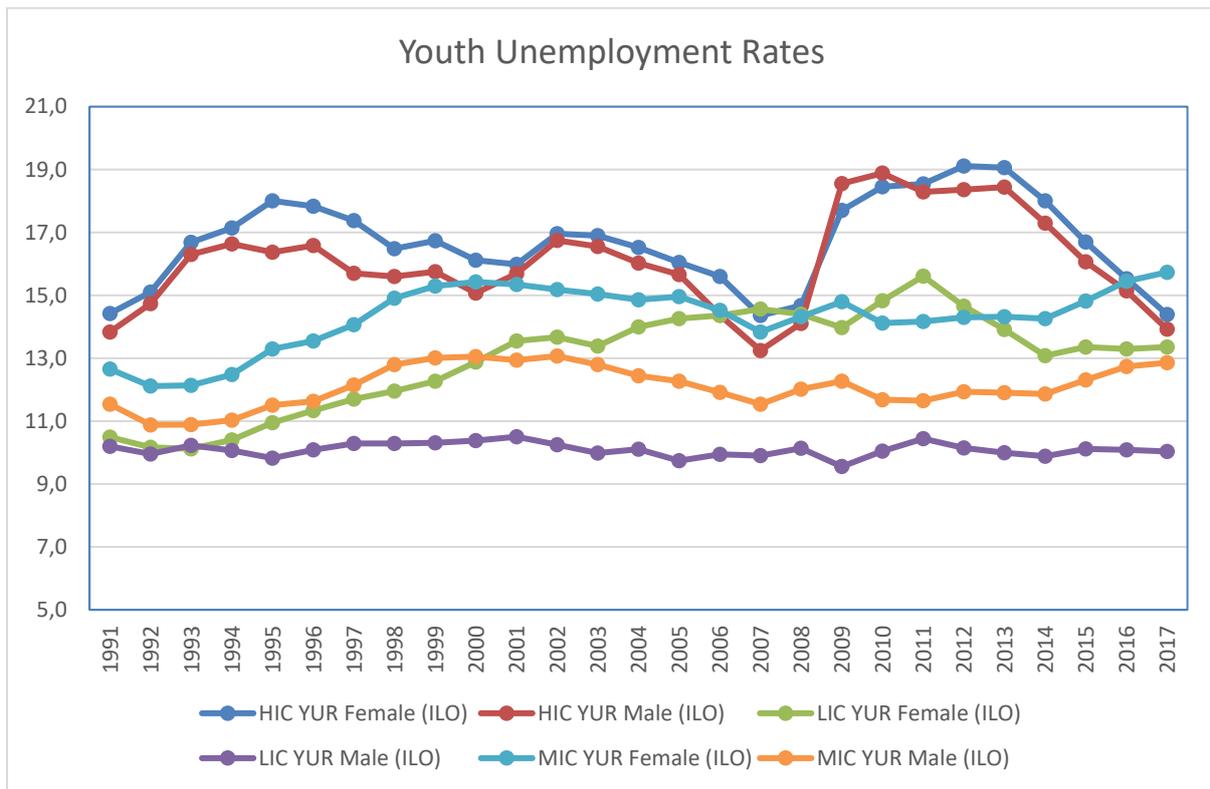
**Figure 1: Youth Employment Population Ratios, M & F (Income Groups)**



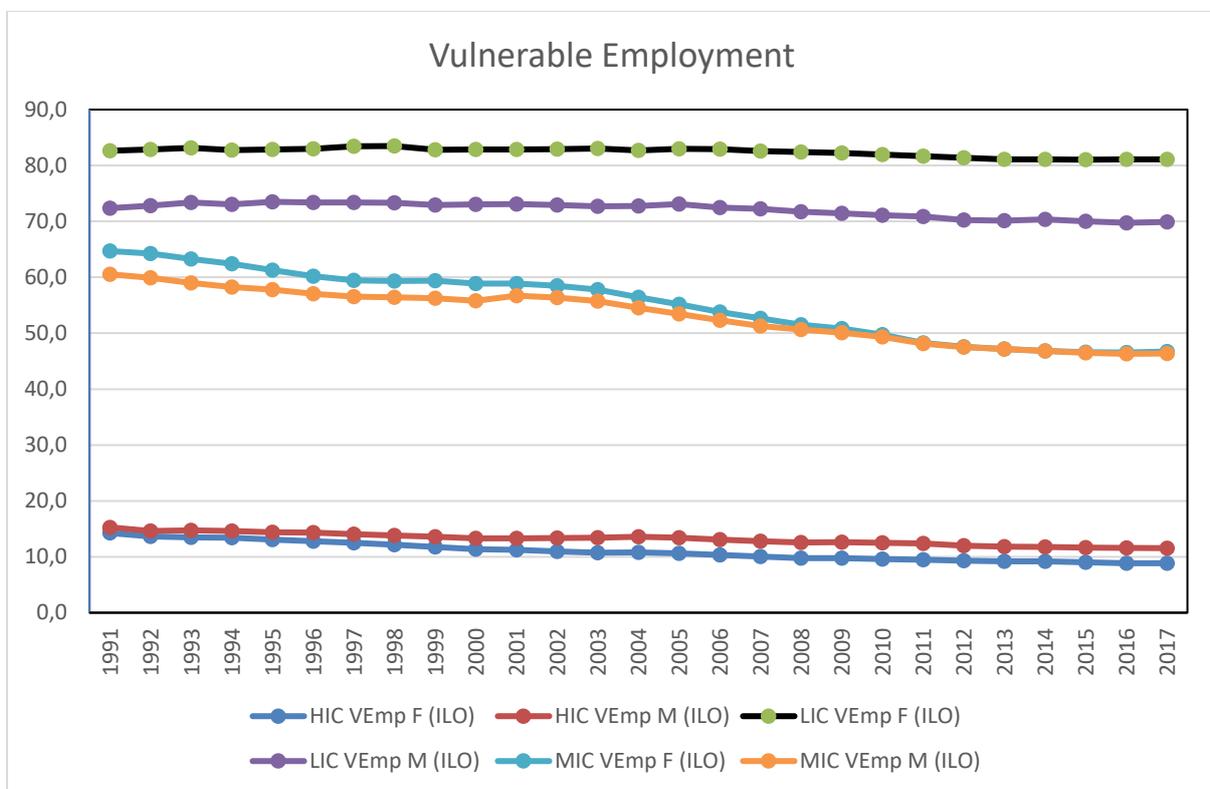
**Figure 2: Youth Labour Force Participation Rates, M & F (Income Groups)**



**Figure 3: Youth Unemployment Rates, M & F (Income Groups)**



**Figure 4: Vulnerable Employment Rates, M & F (Income Groups)**



Source: World Bank World Development Indicators, ILO Modelled Estimates

Table 2 shows the significant differences between male and female labour force behaviour across different regions of developing countries. In general, female labour force participation rates are much lower than for males, and female youth unemployment rates are usually higher than for males (except in the East Asia Pacific). For some regions there are massive differences: for South Asia, Latin America and the Caribbean, and for the Middle East and North Africa females do significantly worse than males. Labour Force Participation Rates for females are significantly lower than for males, mainly due to social, cultural, and religious reasons. Vulnerable Employment Rates (for all ages) are generally higher for females compared to males. Vulnerable Employment Rates are especially high in South Asia and Sub-Saharan Africa: in 2017 the rates for females were almost 80 %!

**Table 2: Gender Differences for different Regions (Developing Countries)**

Region/Variable	1991	1995	2000	2005	2010	2015	2017
EAP Dev YLFPR Female (ILO)	71.09	67.69	61.79	55.00	50.64	45.51	44.13
EAP Dev YLFPR Male (ILO)	73.95	72.02	67.52	61.32	58.57	52.94	51.47
EAP Dev YUR Female (ILO)	9.28	9.10	10.14	10.49	9.56	9.99	9.87
EAP Dev YUR Male (ILO)	10.40	9.69	10.84	10.50	10.39	11.19	10.88
EAP Dev VEmp F (ILO)	69.93	62.86	59.10	51.94	44.99	40.94	40.77
EAP Dev VEmp M (ILO)	65.04	57.44	53.63	46.97	40.40	36.01	35.73
ECA Dev YLFPR Female (ILO)	41.74	41.67	36.47	33.24	33.45	32.75	31.89
ECA Dev YLFPR Male (ILO)	54.79	54.61	49.59	46.15	47.40	47.43	46.86
ECA Dev YUR Female (ILO)	15.33	18.15	19.66	18.08	18.71	19.72	19.76
ECA Dev YUR Male (ILO)	17.83	17.18	18.97	17.50	17.92	16.84	16.86
ECA Dev VEmp F (ILO)	18.17	20.35	23.87	20.26	19.09	17.31	17.52
ECA Dev VEmp M (ILO)	17.21	20.34	22.26	20.79	19.21	18.48	18.90
LAC Dev YLFPR Female (ILO)	38.44	40.16	41.18	43.46	42.71	39.98	40.45
LAC Dev YLFPR Male (ILO)	70.22	69.64	67.19	66.14	64.08	60.54	59.97
LAC Dev YUR Female (ILO)	13.71	15.82	20.15	18.41	17.40	17.81	21.15
LAC Dev YUR Male (ILO)	9.69	10.54	13.82	12.15	11.81	12.14	15.48
LAC Dev VEmp F (ILO)	40.38	41.10	33.44	35.32	33.47	32.95	33.49
LAC Dev VEmp M (ILO)	37.50	37.47	35.51	34.55	32.96	32.88	33.12
MENA Dev YLFPR Female (ILO)	17.27	16.36	15.89	16.56	14.67	13.75	13.76
MENA Dev YLFPR Male (ILO)	57.39	55.68	52.61	51.13	49.07	45.35	45.31
MENA Dev YUR Female (ILO)	33.60	35.29	35.26	38.31	41.45	40.68	42.12
MENA Dev YUR Male (ILO)	23.43	26.67	24.07	21.54	21.64	25.27	24.97
MENA Dev VEmp F (ILO)	44.67	45.70	47.20	48.88	43.87	42.85	39.21
MENA Dev VEmp M (ILO)	37.07	35.84	35.21	35.07	31.53	31.91	31.38
SA Dev YLFPR Female (ILO)	28.23	27.32	25.45	26.90	20.68	19.03	18.67
SA Dev YLFPR Male (ILO)	69.75	68.26	66.48	66.66	57.22	52.38	51.54
SA Dev YUR Female (ILO)	9.87	9.59	12.18	11.37	9.93	11.51	11.87
SA Dev YUR Male (ILO)	8.79	8.50	10.21	9.81	8.53	9.74	9.99
SA Dev YVEmp F (ILO)	89.05	88.71	87.87	87.33	85.12	79.86	79.38
SA Dev YVEmp M (ILO)	77.31	77.84	76.55	78.23	74.93	71.60	71.09
SSA Dev YLFPR Female (ILO)	50.72	49.97	49.73	49.09	47.63	46.47	46.22
SSA Dev YLFPR Male (ILO)	57.24	55.55	54.57	54.15	52.75	51.36	50.95
SSA Dev YUR Female (ILO)	16.51	16.49	17.84	17.17	16.37	14.76	16.06
SSA Dev YUR Male (ILO)	13.06	12.83	13.83	13.04	12.61	11.38	12.31
SSA Dev VEmp F (ILO)	82.36	81.30	80.65	80.67	79.56	78.18	78.32
SSA Dev VEmp M (ILO)	70.26	70.19	69.32	68.98	67.80	65.57	65.30

*Source:* World Development Indicators.

*Notes:* All groups exclude High Income Countries

EAP: East Asia and Pacific

ECA: Europe and Central Asia

LAC: Latin America and Caribbean

MENA: Middle East and North Africa

SA: South Asia

SSA: Sub-Saharan Africa

It is interesting to note that the Middle East and North African (MENA) countries have the highest unemployment rates, followed by Europe and Central Asia (ECA). Countries from Sub-Saharan Africa (SSA), Latin America and the Caribbean (LAC), and East Asia and the Pacific (EAP) have lower rates of unemployment. These countries may have lower rates of unemployment but Sub-Saharan Africa (SSA) and Latin America and the Caribbean (LAC) countries have much higher rates of vulnerable employment.

Table 3 presents results based on sample data from different regions of the shares of formal and informal employment in different regions for youths. What is clear from this table is that informal employment is very high in these regions in both the urban and rural sectors.

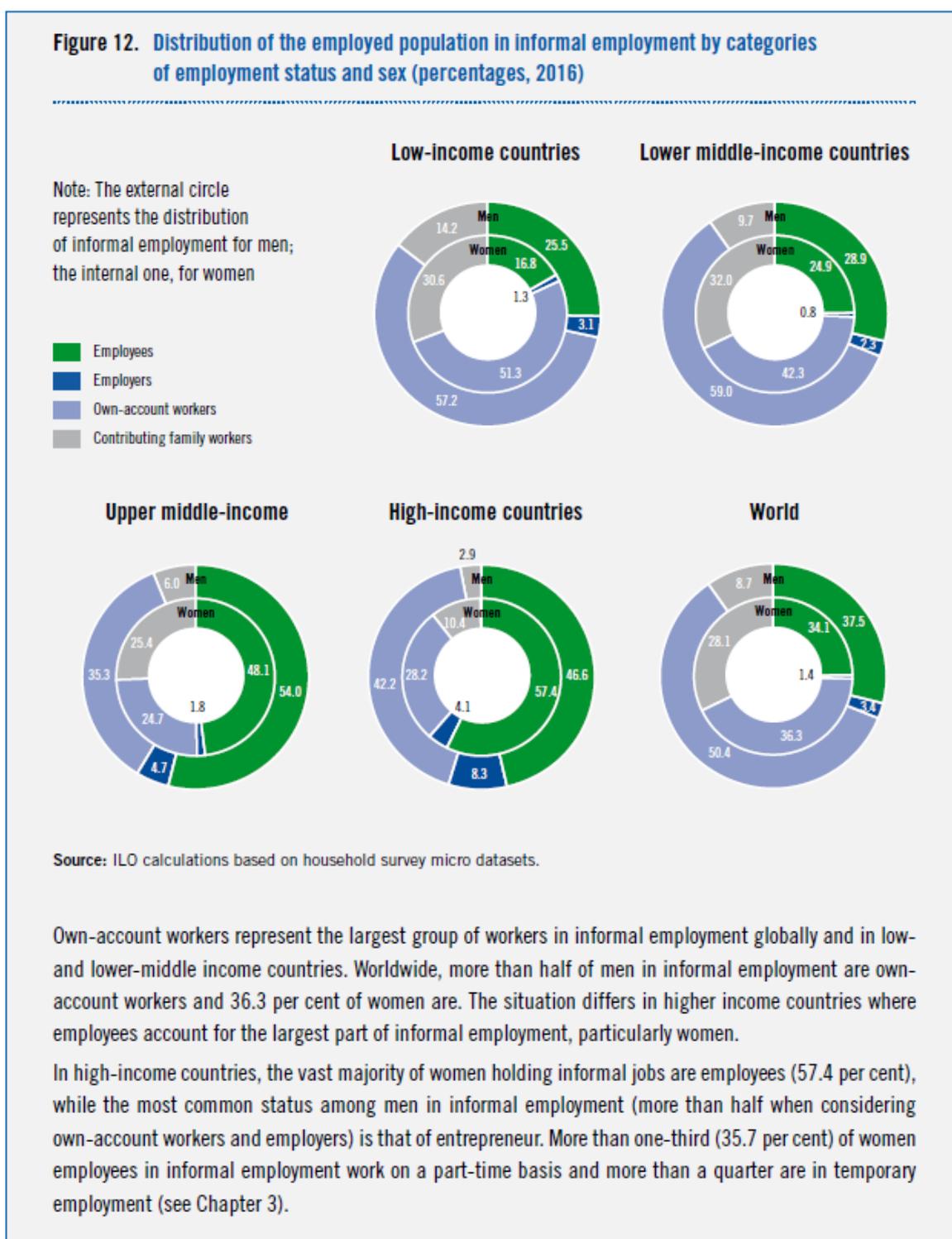
**Table 3: Formal and Informal Employment by Region**

		FORMAL		INFORMAL	
		Rural	Urban	Rural	Urban
SSA	Male	11.9	11.8	88.1	88.2
	Female	11.8	8.6	88.2	91.4
MENA	Male	24.1	20.7	75.9	79.3
	Female	20.2	23.9	79.8	76.1
LAC	Male	14.6	23.3	85.5	76.7
	Female	14.2	45.6	85.8	71.6
ECA	Male	31.2	50.0	68.8	50.0
	Female	38.5	55.1	61.5	44.9
AP	Male	6.7	17.2	93.3	82.8
	Female	8.7	14.9	91.3	85.1

*Source:* ILO (2010) School to Work Transitions data provided by Francesca Bonomelli.

A more recent study by the ILO provides a breakdown of employment by status: employers, employees, own account workers, and contributing family workers, see Figure 5. Note, a sum of the latter two categories provides an estimate of vulnerable employment.

**Figure 5: Informal Employment by Status and Gender**

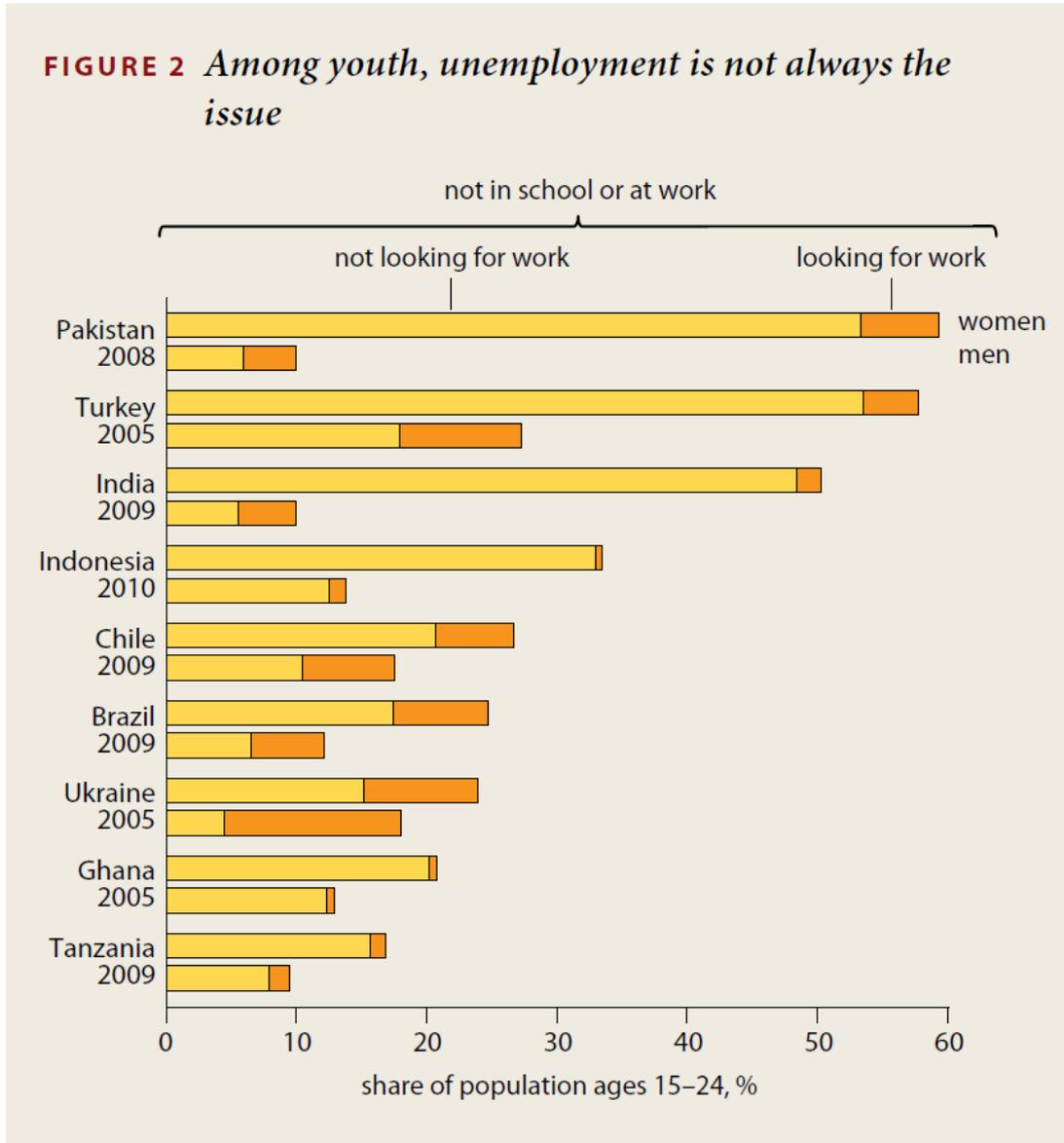


Source: ILO *Women and Men in the Informal Economy*, ILO, Geneva, 2018.

As discussed above, the main problem facing youths (especially in developing areas) is not unemployment but vulnerable employment, especially in the informal sector. In developing

countries youths are not “employed” in the formal sense and are “not looking for work” and hence not “unemployed” in the formal sense. This is illustrated in Figure 4 below.

**Figure 6: Unemployment is not a problem faced by Youths**



Source: World Development Report 2013 team.

Source: World Development Report 2013, p. 6

#### 4. Econometric Analyses: Panel Regressions

In this section we estimated models for Youth Labour Force Participation Rates (YLFPR), Youth Employment Population Rates (YEPR), and Youth Unemployment Rates (YUR) for all countries for which we had data from the World Development Indicators. These models were estimated on panel data using Fixed Effects methods. The estimates given below are provided with standard errors that are corrected for heteroscedasticity (robust standard errors). The estimated models are:

$$YLFPR_{it} = \alpha + \beta Agr Share_{it} + \gamma Inds Share_{it} + \delta (I/GDP)_{it} + \theta \ln(gdp_{pc})_{it} + \pi gdpgrowth_{it} + c_i + \varepsilon_{it}$$

$$YEPR_{it} = \alpha + \beta Agr Share_{it} + \gamma Inds Share_{it} + \delta (I/GDP)_{it} + \theta \ln(gdp_{pc})_{it} + \pi gdpgrowth_{it} + c_i + \varepsilon_{it}$$

$$YUR_{it} = \alpha + \beta Agr Share_{it} + \gamma Inds Share_{it} + \delta (I/GDP)_{it} + \theta \ln(gdp_{pc})_{it} + \pi gdpgrowth_{it} + c_i + \varepsilon_{it}$$

In this approach we are testing to see whether the composition of GDP affects the youth labour market, in particular, if the agricultural sector plays an important role, compared to the industrial sector. In addition, we expect aggregate demand variables to improve labour market participation and employment rates positively, and the unemployment rate negatively. Thus, we expect gross capital formation (investment as a share of GDP) and GDP per capita to have a positive effect on labour market variables.

In the above equations the  $c_i$  are the fixed effects terms and the  $\varepsilon_{it}$  are the idiosyncratic error terms. As discussed earlier, the data on many variables is not complete, especially for many labour market variables. The ILO produces modelling estimates for these labour market variables to fill in the gaps in the time series data for many countries. In our results given below we show estimates when we have used the actual data and then the ILO estimated data. In the former case, when we estimate models in Stata it automatically excludes missing values and hence the sample sizes are much smaller.

In Table 4 we present results for the full sample of countries from the World Bank's World Development Indicators. In an attempt to capture the impact of different sectors on different aspects of the youth labour force, we estimated the models with the share of agriculture in GDP

and the share of Industry in GDP<sup>14</sup>. As discussed earlier we mentioned that for many of the poorer economies, agriculture played a very important role. As we see this variable is consistently significant for most of the dependent variables: the higher is the share of agriculture in GDP, the higher are the participation rates and the employment-population rates, and the lower are the unemployment rates. The share of industry in GDP plays a similar role. The share of investment in GDP (an aggregate demand factor) is also always statistically significant and does as expected: it increases YLFPR and YEPR and decreases YUR. The log of GDP per capita is negatively associated with YLPR, YEPR, and YUR. As GDP per capita rises, educational levels increase and lead to a fall in the LFPR and EPR. It also leads to a fall in the unemployment rates. The growth rate of GDP leads to a fall in the unemployment rate (an aggregate demand effect) and has a negligible impact on YLFPR and YEPR. Although there are differences between the estimates using the ILO modelled data and the other sample, it is pleasing to see that the signs and significance of the coefficients are usually consistent with each other.

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<sup>14</sup> In some earlier estimates we had used both the share of manufacturing in GDP and the share of industry in GDP. Our results suggested that we had to drop one variable. The sample was much smaller when we used Manufacturing share in our estimations and hence we opted to keep the industrial share.

**Table 4: Estimates for Full Sample of Countries (Fixed Effects)**

	<b>YLFPR</b>	<b>YLFPR (ILO)</b>	<b>YEPR</b>	<b>YEPR (ILO)</b>	<b>YUR</b>	<b>YUR (ILO)</b>
<b>Agr Share</b>	0.211	0.137**	0.825***	0.150***	-0.414***	-0.073*
	(0.155)	(0.060)	(0.171)	(0.048)	(0.131)	(0.038)
<b>Inds Share</b>	0.209**	0.150***	0.186*	0.141***	-0.128	-0.054*
	(0.082)	(0.053)	(0.100)	(0.046)	(0.083)	(0.029)
<b>GFCF/GDP</b>	0.153**	0.058	0.525***	0.092***	-0.363***	-0.094***
	(0.074)	(0.036)	(0.105)	(0.028)	(0.075)	(0.032)
<b>lgdp per cap</b>	-3.480	-5.603***	3.633	-3.270	-11.512***	-3.502***
	(3.551)	(2.022)	(3.149)	(2.029)	(2.428)	(1.119)
<b>gdpgrowth</b>	-0.038	-0.036	-0.151***	-0.020	-0.107*	-0.024
	(0.054)	(0.023)	(0.056)	(0.021)	(0.060)	(0.019)
<b>Constant</b>	68.929**	92.765***	-17.096	63.113***	142.506***	53.223***
	(32.491)	(17.991)	(29.793)	(18.217)	(23.665)	(10.346)
<b>N</b>	1542	3283	959	3167	1597	3167
<b>R-sq</b>	0.183	0.270	0.397	0.195	0.232	0.077

**Notes:** Estimated with time dummies, not reported. Sample: 1991-2012.  
Robust Standard errors in parentheses

\* p<0.10      \*\* p<0.05      \*\*\* p<0.01

**Labels**

YLFPR      Youth Labour Force Participation Rate (15-24)  
YLFPR (ILO)      Youth Labour Force Participation Rate (15-24), ILO Modelling Estimates  
YEPR      Youth Employment-Population Ratios (15-24)  
YEPR (ILO)      Youth Employment-Population Ratios (15-24), ILO Modelling Estimates  
YUR      Youth Unemployment Rates (15-24)  
YUR (ILO)      Youth Unemployment Rates (15-24), ILO Modelling Estimates  
Agr Share      Share of Agriculture in GDP  
Inds Share      Share of Industry in GDP  
GFCF/GDP      Share of Gross Fixed Capital Formation in GDP  
lgdp\_percap      Natural Log of GDP per capita  
gdpgrowth      Growth Rate of GDP  
cons      Constant

As mentioned above, the data are fairly limited when we do not use the ILO modelled estimates and, as such, we shall mainly focus on the estimates labelled ILO. The share of Agriculture (Industry) in GDP is always statistically significant and positive for the labour force participation rate and employment rate, but negative and marginally significant for the unemployment rate. The share of investment in GDP, an aggregate demand indicator, is statistically significant for the employment rate and unemployment rate. The GDP per capita is statistically significant and negative for the unemployment rate and the labour force participation rate. As the country becomes richer, more people stay on in School and hence the labour force participation rate falls, and this also lowers the unemployment rate. The growth rate, again an indicator for aggregate demand, is significant for the employment rate and marginally significant for the unemployment rate.

If we look at the magnitude of the parameter estimates (Table 4), we see that a one percentage point increase in the share of Agriculture has a bigger impact than the share of Industry on employment population rates (for the ILO estimates) and employment-population ratios. The unemployment rate falls more with a one percentage point increase in the Agricultural share compared to the Industry share. Hence, these results suggest that for helping youths in the labour market, expanding agriculture is more important than industry.

We estimated these models for different income groups and different regional groups. Unfortunately, the sample sizes were too small in many cases to obtain estimated parameters for the Low Income Countries. For High Income countries, we obtained some interesting results, see Table 5 below. In general, the results are similar to the full sample of all countries with signs of the coefficients being similar, except the statistical significance has fallen for some variables. In particular, the Agricultural share in GDP is no longer significant for YLFPR and YEPR but is negative and significant for the unemployment rate. Log GDP per capita loses significance for the employment-population rate. Note however, that the sample sizes fell significantly where we used the actual data, not the modelled data. Again, the unemployment rate falls by a larger amount when the Agricultural share increases by one percentage point compared to a similar increase in the Industry share. It is clear that investment (share of Gross Fixed Capital in GDP) is a very significant variable that shows that if we wish to influence the labour market we need to increase investment.

**Table 5: High Income Countries**

	<b>YLFPR</b>	<b>YLFPR (ILO)</b>	<b>YEPR</b>	<b>YEPR (ILO)</b>	<b>YUR</b>	<b>YUR (ILO)</b>
<b>Agr Share</b>	0.779	0.506	0.965*	0.675	-1.575***	-0.882*
	(0.639)	(0.376)	(0.517)	(0.407)	(0.488)	(0.450)
<b>Inds Share</b>	0.176	0.207**	0.323**	0.315***	-0.388***	-0.291**
	(0.109)	(0.081)	(0.120)	(0.105)	(0.128)	(0.134)
<b>GFCF/GDP</b>	0.394***	0.327***	0.935***	0.517***	-0.764***	-0.571***
	(0.105)	(0.073)	(0.110)	(0.105)	(0.139)	(0.135)
<b>lgdp_percap</b>	-4.256	-6.042**	0.049	-0.905	-12.884***	-8.887***
	(3.611)	(2.642)	(2.550)	(2.558)	(2.822)	(2.673)
<b>gdpgrowth</b>	-0.133**	-0.062	-0.126***	0.034	-0.150***	-0.213***
	(0.055)	(0.053)	(0.047)	(0.045)	(0.046)	(0.051)
<b>cons</b>	75.666*	94.516***	6.507	25.023	184.292***	134.772***
	(37.753)	(27.304)	(27.060)	(27.330)	(32.620)	(31.652)
<b>N</b>	881	1047	748	1018	918	1018
<b>R-sq</b>	0.222	0.281	0.464	0.325	0.45	0.339

Robust Standard errors in parentheses

\* p<0.10      \*\* p<0.05      \*\*\* p<0.01

We estimated the model for Middle Income Countries, Table 6 below, and the Agricultural share was positive and significant only for the employment-population rate. The industry share was positive and significant for YLFPR and YEPR (ILO) but not significant for the unemployment rate. Interestingly, the log of per capita GDP was negative and significant for YLFPR and YEPR but was not significant for the unemployment rate (except at ten percent levels of significance for the ILO modelled estimates). The growth rate was also usually insignificant, except at the ten percent level for YLFPR (ILO) and five percent for YEPR (ILO). However, it was positive and not statistically significant for the unemployment rate. (Note the sample sizes were very small except for the ILO modelled variables, and for the unemployment rate). It should also be noted that the explanatory power of the unemployment equation was very low and hardly any variable was statistically significant. Clearly, we need another model to explain the unemployment rate of Middle Income Countries. As discussed earlier, many young people cannot afford to be unemployed but have to find some kind of work, whether in the formal sector, or if not in the informal sector. Investment is a significant variable (at least at the ten percent significance level) for the employment-population rate and for the unemployment rate.

**Table 6: Middle Income Countries**

	<b>YLFPR</b>	<b>YLFPR (ILO)</b>	<b>YEPR</b>	<b>YEPR (ILO)</b>	<b>YUR</b>	<b>YUR (ILO)</b>
<b>Agr Share</b>	0.292	0.219**	0.388**	0.190**	-0.165	-0.059
	(0.191)	(0.098)	(0.147)	(0.077)	(0.111)	(0.045)
<b>Inds Share</b>	0.313**	0.183***	0.223	0.133**	-0.078	-0.012
	(0.119)	(0.067)	(0.135)	(0.054)	(0.101)	(0.029)
<b>GFCF/GDP</b>	0.06	0.045	0.235**	0.058*	-0.233**	-0.055
	(0.119)	(0.052)	(0.112)	(0.033)	(0.089)	(0.038)
<b>lgdp_percap</b>	-8.583**	-7.326***	-11.579***	-5.000***	-3.758	-2.087*
	(3.600)	(1.751)	(4.060)	(1.555)	(2.317)	(1.081)
<b>gdpgrowth</b>	0.026	-0.050*	-0.028	-0.048**	0.021	0.008
	(0.058)	(0.028)	(0.068)	(0.024)	(0.055)	(0.025)
<b>cons</b>	105.672***	99.193***	121.176***	71.374***	65.447***	41.534***
	(33.959)	(16.685)	(37.946)	(14.723)	(21.258)	(9.847)
<b>N</b>	703	1921	271	1737	747	1737
<b>R-sq</b>	0.236	0.352	0.445	0.286	0.067	0.02

Robust Standard errors in parentheses

\* p<0.10      \*\* p<0.05      \*\*\* p<0.01

We then attempted to estimate the models for different regions, and again in most cases the sample sizes were too small to obtain parameter estimates and are not reported here.

Given the data are fairly limited for sub-sets of the full sample of countries, the next set of econometric results are simply presented for the *full sample*. In Table 7 we present results allowing for the endogeneity of the GDP per capita variable by estimating the model using instrumental variables methods. The variable lgdp per capita is instrumented by its lagged value and other exogenous variables.

**Table 7: Instrumental Variables Estimates**

	<b>YLFPR</b>	<b>YLFPR (ILO)</b>	<b>YEPR</b>	<b>YEPR (ILO)</b>	<b>YUR</b>	<b>YUR (ILO)</b>
<b>lgdp per cap*</b>	-7.322**	-7.495***	-1.439	-4.843***	-6.166***	-2.294*
<b>Agr Share</b>	0.279	0.171**	0.965***	0.176***	-0.372**	-0.086*
<b>Inds Share</b>	0.239**	0.163**	0.259**	0.157***	-0.190*	-0.073*
<b>GFCF/GDP</b>	0.186**	0.056	0.573***	0.097***	-0.443***	-0.110**
<b>Constant</b>	103.421***	106.933***	26.432	74.594***	97.366***	44.113***
<b>N</b>	1485	3157	942	3046	1553	3046

\* This variable was treated as an endogenous variable.

The model was estimated in Stata 14 using the `xtivreg` command treating the log of GDP per capita as an endogenous variable, with lagged values as instruments<sup>15</sup>. As in the previous estimates, we see that the composition of GDP is significant in affecting the labour market variables. The larger the share of agriculture in GDP, the higher the labour force participation rates and employment population rates, and the lower the unemployment rates (although the latter variable is significant only at the ten percent level). The higher the GDP per capita, the lower the labour force participation rates and the employment population rates, and the lower is the unemployment rate. Investment (which we take as indicative of the level of aggregate demand) plays a positive role in affecting the labour force participation rates and the employment population rates, and the lower is the unemployment rate.

Finally, the model was estimated by GMM methods to allow for a dynamic panel with fixed effects and instrumental variables. As this method is appropriate for wide panels and short time periods, we estimated the model on data from 2000 to 2012. The samples for the dependent variables which did not have the ILO interpolated data were too small to estimate using this method. The model was estimated in Stata 14 using the `xtabond` command.

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<sup>15</sup> As the growth rate was insignificant and did not affect the other variables, it has been excluded. The results were otherwise similar.

**Table 8 (a) Labour Force Participation Rate (Arellano-Bond)**

<b>YLFPR (ILO)</b>						
	<b>Coef.</b>	<b>Std. Err.</b>	<b>z</b>	<b>P&gt; z </b>	<b>[95% Conf.</b>	<b>Interval]</b>
<b>lag Dep Var</b>	0.869	0.047	18.610	0.000	0.778	0.961
<b>Agr Share</b>	0.040	0.018	2.180	0.029	0.004	0.075
<b>Inds Share</b>	0.038	0.016	2.440	0.015	0.007	0.069
<b>GFCF/GDP</b>	0.021	0.010	2.190	0.028	0.002	0.041
<b>lgdp per cap</b>	0.210	0.522	0.400	0.687	-0.812	1.233
<b>GDP growth</b>	0.008	0.010	0.780	0.435	-0.012	0.027
<b>Constant</b>	1.948	6.591	0.300	0.768	-10.970	14.865

Arellano-Bond dynamic panel-data estimation Number of obs = 1,708

Group variable: country Number of groups = 165

Number of instruments = 93

**Arellano-Bond test for zero autocorrelation in first-differenced errors**

Order	z	Prob > z
1	-4.853	0
2	0.88964	0.3737

**Sargan test of overidentifying restrictions**

H0: overidentifying restrictions are valid

chi2(86) = 102.6679

Prob > chi2 = 0.1062

**Table 8 (b) Employment Population Rate (Arellano-Bond)**

<b>YEPR (ILO)</b>						
	<b>Coef.</b>	<b>Std. Err.</b>	<b>z</b>	<b>P&gt; z </b>	<b>[95% Conf.</b>	<b>Interval]</b>
<b>lag Dep Var</b>	0.884	0.051	17.280	0.000	0.784	0.985
<b>Agr Share</b>	0.082	0.028	2.990	0.003	0.028	0.136
<b>Inds Share</b>	0.050	0.020	2.440	0.015	0.010	0.090
<b>GFCF/GDP</b>	0.050	0.014	3.630	0.000	0.023	0.076
<b>lgdp per cap</b>	1.113	0.571	1.950	0.051	-0.005	2.232
<b>GDP growth</b>	0.091	0.017	5.300	0.000	0.057	0.125
<b>Constant</b>	-9.765	6.614	-1.480	0.140	-22.728	3.198

Arellano-Bond dynamic panel-data estimation Number of obs = 1,648

Group variable: country Number of groups = 159

Number of instruments = 93

**Arellano-Bond test for zero autocorrelation in first-differenced errors**

Order	z	Prob > z
1	-5.1834	0
2	1.5869	0.1125

**Sargan test of overidentifying restrictions**

H0: overidentifying restrictions are valid

chi2(86) = 106.4509

Prob > chi2 = 0.0668

**Table 8 (c) Unemployment Rate (Arellano-Bond)**

<b>YUR (ILO)</b>						
	Coef.	Std. Err.	z	P> z	[95% Conf	Interval]
<b>lag Dep Var</b>	0.803	0.055	14.550	0.000	0.695	0.911
<b>Agr Share</b>	-0.113	0.043	-2.630	0.009	-0.197	-0.029
<b>Inds Share</b>	-0.024	0.036	-0.670	0.504	-0.095	0.046
<b>GFCF/GDP</b>	-0.092	0.029	-3.120	0.002	-0.150	-0.034
<b>lgdp per cap</b>	-1.906	0.779	-2.450	0.014	-3.432	-0.380
<b>GDP growth</b>	-0.187	0.032	-5.860	0.000	-0.250	-0.124
<b>Constant</b>	25.463	7.320	3.480	0.001	11.117	39.809

Arellano-Bond dynamic panel-data estimation Number of obs = 1,648

Group variable: country Number of groups = 159

Number of instruments = 93

Arellano-Bond test for zero autocorrelation in first-differenced errors

Order	z	Prob > z
1	-4.3103	0
2	0.80215	0.4225

Sargan test of overidentifying restrictions

H0: overidentifying restrictions are valid

chi2(86) = 111.4561

Prob > chi2 = 0.0339

These results confirm our previous results. As in our earlier estimates, all the variables are statistically significant and have the same signs. The models also satisfy the tests for autocorrelation of the second lag of residuals and the Sargan tests for over-identification of restrictions. The lagged dependent variables are less than one, satisfying the condition of dynamic stability.

To summarise these results: we find that the sectoral composition of GDP (share of Agriculture, and share of Industry in GDP) play an important role in affecting the labour force participation rates, employment-population rates, and the unemployment rates of youths. In particular, the share of agriculture helps to lower the youth unemployment rate as youths are often employed in the agricultural sector. In many cases we saw that a one percentage point increase in the Agricultural sector led to a bigger decrease in the unemployment rate compared to a similar increase in the Industry share. Clearly, the level of GDP and the growth rate of GDP appear to lower the youth unemployment rate. However, this may be simply because the richer the society the more youths stay on in education and hence there is a smaller percentage of youths

in the labour market. Investment (share of Gross Fixed Capital Formation in GDP) was almost always very significant, especially in lowering the unemployment rate and the employment population rate suggesting that we need to consider ways of increasing investment.

## **5. Some Conclusions**

Our study so far has shown that we should distinguish between different countries not only according to their income levels (level of development) but also according to their individual cultural and historical backgrounds. We argued that for most of the poorer economies, the role of agriculture was very important in providing employment for young people. Our descriptive analysis and our econometric analysis support the importance of the agricultural sector for these countries. We also found that the level of aggregate demand was important in increasing labour force participation rates and employment rates and lowering unemployment.

We cautioned about using a fall in the Employment-Population rate or the labour force participation rate as indicating a worsening of the labour market in developed economies as it simply reflected the increased participation of young people in education. We also cautioned against comparing the relatively low rates of unemployment in poor countries as reflecting a strong labour market, as many young people were forced (by economic circumstances) to find work in the informal or vulnerable economy.

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