# Annex I: GUIDED ENQUIRY for Job Diagnostics

## INTRODUCTION

**Economic growth and jobs are entwined**. Economies grow when more people join the labor force and find work, when they get better at what they do, and as they move from low productivity work to better, higher productivity jobs. Jobs determine labor incomes and consumption for most people in the economy, driving the demand for goods and services from which, in turn, the demand for labor is determined.

**Economic development involves structural change**[1] **which entails a changing pattern of jobs.** Job opportunities in an economy evolve as new investors open new firms in new locations, as they adopt new innovative techniques to produce new products in the economy that supply new demand either at home or abroad. The processes of creative destruction unleashed as entrepreneurs reallocate their capital causes some old jobs to be lost to the economy, and other new jobs to be created. Economic transformation ultimately happens through the workers' job transitions; workers (and capital) change sectors, move locations, and switch occupations. Workers move, for example, from self- to waged-employment and move between firms as economies grow and evolve. In low income economies a shift of labor out of low productivity "traditional" work to the higher productivity "modern sector" is a very significant engine of real GDP growth and can result in improved livelihoods for most individuals.

**A jobs diagnostic identifies the core jobs challenges of a country following empirical evidence at the macro, worker, and firm level.** The diagnostic identifies *symptoms*, interprets these symptoms, and prioritizes a set of jobs challenges. Data analysis is conducted at the level of the aggregate economy, at the level of the individual worker, and at the level of the firm. The macro analysis looks at the country's demography and the big picture for jobs outcomes in relation to real economic growth. The worker level (*labor supply*) analysis investigates who is getting what sorts of jobs in the economy. The firm-level analysis focuses on who is creating more *better* jobs in the formal private sector (as a proxy for *labor demand*).

**The central enquiry of the jobs diagnostic is into how a country's jobs outcomes have changed with economic growth, and specifically, how people have transitioned into new jobs to take advantage of the growing economy**. The jobs outcomes that are assessed in aggregate against growth in real GDP value added are the creation of more jobs (increased employment), and better jobs (increased labor productivity (value added per worker)). Employment, productivity (sales or value added per worker) and remuneration of workers are the focus of the formal private sector firm-level analysis, which distinguishes between types of firms based on their characteristics. The worker-level labor supply analysis hanging patterns of employment, and earnings. Emphasis is placed on how the profile of jobs in the economy is changing, and which types of individuals (by age, gender, education, rural versus urban) get the jobs. This complements the overall analysis with measures for the inclusiveness of jobs.

**The jobs diagnostic asks structured questions to identify a comprehensive set of `symptoms' from data, which are then compared to "normal" results from other countries**. A symptom can be symptomatic of more than one problem or underlying jobs challenge. Plus jobs challenges tend to evolve based on where a country

[1] McMillan and Rodrik (2011), "Globalization, structural change and productivity growth", NBER Working Paper 17143, June 2011.

is on its business cycle, and especially depending on its level of income (see Merotto, Weber and Aterido (2018)[2]). The art of the Jobs Diagnostic therefore rests in *interpretation* of the findings or symptoms. Which of the symptoms suggests abnormality given the type of country (its characteristics), and its position on the economic cycle (its initial conditions)? Taking account of normal and abnormal symptoms, country characteristics and country conditions together, the jobs diagnostic strives to understand what may be the underlying cause (*or syndrome*) of the observed symptoms? This annex sets out the structured questions in the form of a guided enquiry.

***What is the overall context?***

The overall context of the jobs diagnostic compares the country's demographics and labor market indicators (share of working age population, labor force participation, employment by sector, urban and waged shares of employment) to other countries using international comparisons. Analysis is reconciled with the `supply side' aggregates derived from household surveys for the profile of jobs and work in the economy (see supply side questions 1.1 – 1.5). The overall context identifies any challenges that are unique to a country's context, by benchmarking the country's jobs outcomes and labor market structures with those of similar countries, and with those of countries with slightly higher and slightly lower GDP per capita. Attention is paid to the important channels through which labor transitions into new, better jobs with economic transformation; ie formalization, structural change, and urbanization.

First the overview uses demographic data and projections from WDI and UNPOP data to identify past trends and to project growth in the population, the working age population, dependency, labor force, and employment rates. Where a country is on the demographic transition fundamentally affects its jobs challenges. Youthful countries must create more jobs annually than aging countries, and so face the challenges of creating better jobs for youth, and hastening the school-to-work transition. In contrast, aging countries and those that have entered the demographic transition must raise labor productivity, and may face the challenge of increasing labor force participation.

Second the overview uses Labor Force Surveys and WDI data to establish whether: (i) a higher share of jobs is waged, (ii) labor is moving from lower (agriculture) to higher productivity sectors (industry and services), and (iii) whether the share of people (and jobs) in urban areas is rising. Global analysis and the country diagnostics undertaken to date show that a growing economy experiencing economic transformation should expect to see better jobs created through these three channels of formalization, economic transformation and urbanization.

### 1.1.How does the country's demography (youthful, aging) affect its jobs challenges?

a. What are the youth and old age dependency ratios and how do they compare with other countries? [*Benchmarking}

### 1.2.What share of the population is of working age?

### 1.3.What share of the working age population is in the labor force and how does this compare with other countries? [*Benchmarking]

### 1.4.What is the employment rate (share of labor force that is employed)?

[2] "Facts and Findings from Jobs Diagnostics" by Merotto, D. Weber, M. and Aterido, R. World Bank (2018)

1..5. What share of employment is salaried ("wage employment" in LFS) and how does this compare with other countries? [*Benchmarking}

1.6. What is the sectoral composition of employment?

1.7. Is the country urbanizing? What is the change in the share of the population in the primary city, other urban areas, and rural?

## Macro

**The macro diagnostic sets the aggregate trends in demography, growth and jobs outcomes, which is then explored in more detail under the supply and demand diagnostics**. The macro section uses WDI data or manually inputted data on sectoral employment and real GDP value added from other sources, to decompose per capita real GDP growth into growth in productivity, demography and employment, and to analyze trends in structural change over time. The results for a country's past growth episodes are compared against all countries' growth and structural change experiences, and to a group of comparable countries with similar characteristics and conditions. The comparisons allow an assessment of whether labor productivity and employment growth are within *normal ranges* for a similar country.

***Question 1: How many jobs need to be created to accommodate new entrants to the workforce and what would be the number in the formal sector?*** (Reference should be made to the sectoral growth rates in employment in the supply and demand sections, and where feasible the growth rates should be reconciled).

The macro diagnostic starts by asking how many new jobs will need to be created for the future workforce. Taking UNPOP base case projections, and assuming the recent past elasticities of employment to GDP growth by sector continue, and that unemployment and labor force participation rates remain unchanged, the jobs diagnostic macro enquiry first asks *by how much employment will need to grow to find jobs for the new entrants to the workforce*?

Higher productivity "better" *waged* jobs have a higher share of total employment in richer countries. These jobs tend to be in the formal private sector. The macro diagnostic therefore also asks what share of the total jobs need to be in the formal private sector for the share of formal private sector in total employment to remain constant? The resulting number is then compared to past growth in the formal private sector (from the demand-side diagnostic) to assess whether it seems feasible. If not, the team should consider with MTI and FCI colleagues what would be needed to accelerate firm start-ups, entry and employment growth in formal private firms.

Next, to complete the analysis of scenarios for new entrants to the workforce, the macro diagnostic asks what sectoral shares of employment would be needed to absorb new entrants to the workforce without reducing aggregate average labor productivity. The calculations are provided as consistency tests for projecting jobs outcomes with GDP forecasts. This bounds testing can be done assuming no change to labor productivity, or by adjusting the forecast rate for labor productivity. An alternative approach is to take a given per capita GDP growth rate and then iterate between employment shifts and assumptions about labor productivity whilst achieving the Government's targeted GDP per capita growth rate. These consistency calculations are performed through the Jobs Group's JobStructures macro tool. The macro "JobStructures" excel-based tool

allows the analyst to investigate scenarios for economic growth, jobs outcomes and structural change. It provides a consistency check on what outcomes for sectoral labor productivity, sectoral employment and inter-sectoral employment shifts are consistent with achieving a country's targeted per capita GDP growth rate[3]?

1.1.What growth rate in employment will be necessary to maintain a stable rate of unemployment (status quo)? What does this mean for the number of new jobs that need to be created?
(Note: Using the JobStructures demography tool projections sheet, and applying UNPop projections and reasonable assumptions about labor force participation.

1.2.Considering the demand for labor, how many of these jobs need to be formal private sector jobs to maintain its share of total employment? (*Calculate on formality shares*)

1.3.What pattern of sectoral employment would be needed to absorb these new workers without reducing average labor productivity, or to achieve a given per capita GDP growth rate?
(Note: Applying the JobStuctures tool)

***Question 2: Has the economy grown fast enough to create enough jobs for the working age population?***

The macro enquiry then compares employment and labor productivity growth (in aggregate using employment elasticities, and by sector) against a country's growth in working age population, labor force and real GDP value added. The guided enquiry sets out to identify whether economic transformation is resulting in *enough better jobs* for the workforce given its growth over time.

2.1. What are the growth rates of real GDP relative to growth in:

a. Population
b. Working age population
c. Labor force
d. Employment

2.2. What is the employment elasticity of growth? Is employment rising with real GDP?

a. In aggregate?
b. By sector?

2.3.How do growth rates in the labor force and employment and the elasticities of employment to GDP compare with those in other countries?
[*Benchmarking using JobStructures global comparison tool]

2.4.How do these results compare with growth episodes in other countries? [*Benchmarking]

***Question 3: How have jobs contributed to income per capital and labor productivity growth, and was this through gains within sectors, or from structural change?***

Questions 1 and 2 of the macro enquiry ask whether the country has been growing fast enough to create enough jobs for entrants, and whether (through growth in productivity) *better* jobs are being created on

[3] The JobStructures structural change tool can be used for instance alongside MTI's MFMod forecasting tool for sectoral real GDP, applying UNPop projections for the working population with default assumption that employment growth, patterns of

average in the economy. Questions 3.1 – 3.5 use growth decompositions to investigate how important changes in the working age population, labor force participation employment rate and productivity changes have been to growth in GDP per capita. The macro enquiry then explores through further decomposition what share of productivity growth came from gains *within sectors*, or from the *reallocation of labor* between sectors. This is a crucial part of the macro analysis, given that economic development involves structural change, which entails a changing pattern of jobs.

The macro enquiry establishes the growth rate in *aggregate and sectoral labor productivity*, which can be compared using the JobStructures global comparison tool, to other countries' growth episodes. The results are also compared for the country under investigation, with aggregates for the formal sector from the demand side analysis.

Next the enquiry sets out how important labor productivity growth has been to GDP per capita growth relative to growth in the employment rate, the labor force participation rate and dependency (the share of the working age population to total population). Again, this can be compared with growth episodes for all other countries, or for a selection of similar countries. For some countries it may for example show that whereas dependency is declining, labor productivity is growing more slowly, and is contributing much less to per capita GDP growth than in comparable countries. (This is the case in the Pakistan Jobs Diagnostic for instance, where productivity growth gas been slower than in Bangladesh).

Third the macro enquiry sets out how sectoral shifts in value added (structural changes) in the economy are affecting patterns of employment in the economy, and how labor productivity is growing within and across sectors. Again, this is done using the JobStructures macro tool. This is a very important step of the macro enquiry, because it is where the analysis of structural change (economic transformation and jobs) is made. The channels identified in this section shape the lines of enquiry for deeper investigation using micro data in the supply and demand sections of the jobs diagnostic. The results of the productivity decomposition are compared with those from real GDP growth episodes in other countries using the JobStructures global comparison tool. The analysis can also be adapted to take account of the differentials in labor productivity between sectors in the country. In theory structural change slows down when marginal products between sectors are equalized. However, an important additional dimension is that averages for a sector do not reflect the sizeable differentials between the traditional / informal sector and the non-traditional formal sector. The analyst should therefore compare the results for changes in national averages for labor productivity with those from formal private firms in the demand-side diagnostic.

Finally, recognizing that the demand for labor is a derived demand from the demand for goods and services, the macro diagnostic can be *extended* using WDI data on real gross domestic expenditure, to analyze how aggregate demand is growing, and whether output in the economy is increasing to meet this demand. An extension to this component for the production of product groups that are found to be especially important activities for jobs outcomes (such as food products in LICs) could be to compare WITS data on real net trade flows for specific products to changes in real consumption of these products over time. This establishes whether the economy is getting better at supplying its own increased demand for significant products[4].

[4] The Jobs Group is piloting such a tool for use in FY19

### 3.1.What are the growth rates in real GDP per employed person?

a. In aggregate
b. Within sectors; agriculture, industry, services (7 customizable sub-sectors is also possible using the Jobs Group's JobStructures tool).

### 3.2.What is the contribution to growth in per capita real GDP of changes in:

(Note: using a Shapley decomposition method)

a. Working age/ Population
c. Labor force participation (labor force / working age population)
d. Employment rate (employment / labor force)
e. Labor productivity (real GDP / employment)

### 3.3.What is the contribution to total productivity (decomposition) of;

a. Productivity gains within sectors?
b. Reallocation (inter-sectoral shift), ie are there shifts in employment between sectors?

### 3.4.How does this compare with other countries' growth episodes? [*Benchmarking}

Source: JobStructures tool country comparison sheet

### 3.5.What is the change in labor productivity between industry and services relative to agriculture over time?

(Calculations using outputs under 3.1)

## Supply

The supply side analysis sets the context for the country's core jobs challenges. It identifies *how* people work and *where*. It analyzes *who* gets access to *which types* of jobs as the economy grows over time. The analysis of trends in labor market indicators over time checks for symptoms of labor market rigidities or structural dualism. The supply side picks up from the results of the macro enquiry on economy-wide economic transformation and helps interpret the effects of macro-economic developments at the level of the individual worker. It deepens the macro findings by providing an understanding of trends in jobs outcomes for specific groups of people (e.g. female, young, educated, rural). To examine how individuals participate in the economy, it specifically looks into the main labor market indicators and outcomes, such as labor force participation, employment rates and types, hours worked, and labor earnings.

The systematic diagnosis of supply side data follows the profile of work, disaggregating indicators by worker characteristics. For characteristics such as gender, age, education, sector, and location, the jobs diagnostic examines both the pattern, and the trends in:

- demography (working age, dependency)
- labor force participation
- employment, unemployment and inactivity
- the determinants of employment,
- the determinants of labor income, job quality, underemployment

Whilst the supply enquiry deepens the macro narrative, each step of the supply-side enquiry builds on the other. The enquiry starts with the profile of jobs and work. It then traces back how this pattern has changed over time as the economy developed. It identifies *who* has been doing *which types* of jobs in the economy and how the different types of work changed over time. Finally, it provides information on how people benefit from their work, and which individual characteristics determine the sorts of jobs they get. For example, it looks into the probabilities of; (a) participation in the labor force, and (b) and the type of job a person gets (public vs private waged employment, formal vs informal employment, waged vs non-waged employment, agricultural vs non-agricultural employment).

*Question 1: What is the profile of jobs and work in the economy?*

The profile sets out the country's demographics and labor market indicators, and compares these to other countries using international comparisons. Analysis is reconciled with the `macro' aggregates from WDI and ILO data for the profile of jobs and work in the economy (see overall context). The enquiry tracks the profile of jobs and work over time, and benchmarks the country's jobs outcomes and labor market structures with those of similar countries. This process identifies any challenges that are unique to a country's context. As in the macro enquiry, attention is paid to the important channels through which labor transitions into new, better jobs with economic transformation; such as formalization, structural change, and urbanization.

Using an analogy from medical diagnosis, establishing the profile of jobs and work when combined with the country type, is like checking a patient's height, weight, temperature, pulse and blood pressure. It can be used in combination with the patient's age, gender and location (country jobs typology and country characteristics), to establish bounds of normality for the symptoms arising out of subsequent diagnosis.

The profile of jobs and work can be used in combination with the past trends (next question in the supply guided enquiry), to infer how economic transformation should be affecting transitions in the jobs that workers have. For example, Figure 1 shows the average profile of work for Low and Middle-Income Countries combined (LIC, LMIC and UMIC). This broad country grouping has, on average, relatively high inactivity, low unemployment, only 31 percent of the workforce in agriculture, and about 55 percent of those employed are in waged work. In LMICs and UMIC s, the transformation in jobs out of agriculture and into off-farm work is typically underway. Upper Middle-Income Countries typically have a higher share of formal, urban, waged jobs, and a lower share in self-employment. LICs and LMICs are typically usually youthful, and typically see an increase in enrollment in secondary and post-secondary education. The jobs issues they typically face include ensuring a smooth transition from school to work, managing urbanization, raising the productivity of off-farm work, and attracting women back into the labor market.

1.1.What share of the working age population is employed, unemployed, or inactive?

1.2.What share of those employed is in agriculture and non-agricultural employment?

1.3.What is the share of those employed in agriculture and non-agricultural employment is self-employed, waged employees, unpaid family workers or employers?

1.4.What share of wage employment outside of agriculture is formal or informal?

1.5. What share of formal wage employment outside of agriculture is in the public or in the private sector?

***Question 2: What is the trend in labor supply and how is it related to the country's demography?***

Second, the diagnostic analyzes *trends in the profile of jobs and work over time*, to check for symptoms of *labor market rigidities* and *structural constraints*.

A labor market rigidity is caused by a constraint that prevents the labor market from clearing. This could come from a policy distortion, a labor tax or a labor regulation, or from trade labor union restrictions. It could come from a lack of labor market information on vacancies and available workers, or from a lack of skills retraining. Labor rigidities could show up in persistent disparities in wages between formal and informal labor or in the coexistence of unemployment and under-employment with high wage differentials between sectors and employment types. (school to work transitions, unemployment to employment transitions)

A structural constraint arises from mismatches between workers and employers. A common example of a mismatch occurs when employers are looking for skills that are different from those offered by available workers. Another type of mismatch occurs when jobs are available in geographic regions with few qualified job seekers. Labor immobility due to housing costs or shortages of other amenities (like schools and healthcare) can create a structural constraint by preventing workers from moving between locations to take advantage of employment opportunities elsewhere. So too, conceptually, can mismatches in the demand for products in richer urban areas, and the supply of products by the rural poor.

Since Lewis (1954), structuralists have noted the coexistence in low-income countries between dynamic but small modern formal sectors and large residual rural pools of unskilled labor subsisting on marginal land in relative poverty. It could be argued that failure of a rural economy to supply its own urban food markets could create structural mismatch between the supply of rural farm labor and the derived demand for that labor. Structural constraints could show up where real wage and employment differentials persist over time across geography, or where in a fast-growing economy, hiring firms complain about skills gaps, pay increased real wages over time, or bring in foreign workers whilst returns to higher education in-country remain flat.

2.1.What share of the working age population participates in the labor force and are there important variations in participation over time overall and by population sub-groups[5]?

2.2. What are the trends within the active labor force (employed and unemployed) overall and by population sub-groups?

***Question 3: What are the trends in employment?***

This is one of the most critical steps in the guided enquiry. It identifies over time *who* is working in what type of jobs and how these changing patterns of jobs can be linked to economic developments.

For those in employment, the next line of questioning is *what types of jobs workers are holding*, and how this is changing over time. The composition of employment types yields important insights into the functioning and welfare of the economy, thereby complementing the macro-economic analysis. For a growing economy, we expect to see three basic positive transformations in the jobs that people hold. First, we expect the

[5] Data and sampling permitting, population sub-groups include age (youth vs adult), gender (men vs women), area (urban vs rural), regional disaggregation, education as well as combinations of the sub-groups, i.e. area and gender or area, gender and age.

economy to diversify out of agriculture into industry and services. Second, we expect the economy to urbanize, resulting in new employment opportunities. Third, we expect to see waged employment expand, ideally with an increase in the formality of labor contracts[6]. Each of these transitions is explored in this step of the guided enquiry for employment type, sector and occupation. The results are prepared separately by worker characteristics, and can be compered through the global comparison data set to benchmark countries.

3.1.What types of employment[7] do workers hold, are their jobs formal, and how is this changing over time, by population sub-groups and sectors?

3.2.Which sectors employ workers and what are the variations over time and by population sub-groups?

3.3.Which type of occupations do workers hold and how do they change over time and by population sub-groups?

***Question 4: What are the trends in education and how does it affect how people work?***

A worker's level of education is often a key determinant of labor mobility and earnings. For example, in a growing economy that is investing and adopting new technologies and production techniques for more sophisticated products, the complexity and skills content of jobs can be expected to increase with economic transformation. Skills gaps can emerge that would typically be accompanied by high and rising earnings gaps between workers with no education and those with tertiary education. Conversely, a fall in the relative returns to education can be a signal that the supply of education in the economy is rising faster than the demand for workers with education. Given the importance of skills, this section focuses on the completed level of education as a proxy for skills. It tracks the education levels of different groups of workers and over time. Results are compared to the findings on returns to education and over time.

4.1.How has the educational attainment of the working age population changed over time and by population sub-groups?

4.2. At what ages do people leave school to start working and what is the quality of those jobs?

***Question 5: How much do workers earn from work and how do labor market outcomes compare across households?***

An important indicator of whether the demand or the supply of a given type of labor is rising fastest, is what happens to labor earnings and gaps in labor earnings for different jobs and different workers over time. There are two components of earnings: wages (the price of labor) and hours worked (the quantity demanded), and both are analyzed over time in the fifth component of the supply-side diagnostic. Once again, to facilitate the understanding of *which sorts of workers* (gender, age, location, education) are benefiting from *which types of jobs* (occupation, formality status, sector), the analysis of hours worked and earnings is disaggregated by worker characteristics and occupation type. This is an important element for the analysis of inclusive growth through jobs.

The analyst should track not only the trends in each measure, but the relative differences over time. The key to the diagnostic lies in the interpretation of the symptoms. For instance, if the enquiry was to identify that hours worked were rising in urban areas, but earnings were not, or hourly earnings were falling in urban areas, and that this was true

[6] Merotto, Weber and Aterido (20189) op cit.

[7] Different types of employment include self-employment, wage work, employer or unpaid.

of all worker types on average, this would likely be an indicator that labor demand is not keeping up with labor supply. Similarly if wage differentials (hourly earnings) between rural and urban workers are declining, and differences in hours worked are declining, one might expect that the flow of workers to urban areas would slow down[8].

Another way to look at equity or inclusion is to compare labor market indicators across consumption or income deciles. One example would be to contrast labor force participation or the jobs poorer households hold with those of richer households and identify changes over time.[9] The analysis links employment status to income but adds a distributional component. It allows the identification of inequality patterns overall and for population subgroups.

### 5.1.What is the wage distribution by sectors, occupations, education, and population sub-groups and how does it change over time?

### 5.2.How many hours do workers work on average per week and are there changes over time and by sectors, education, formality type of work and population sub-group? What share of workers hold more than one job?

### 5.3.What are the employment related and regional differences between households along consumption or income deciles and how does this change over time?

***Question 6: Which worker characteristics determine labor market outcomes?***

The supply side analysis is completed with regression analysis that controls for a wider set of socio-demographic and economic factors. This section of the supply side enquiry can test the size and significance of observed determinants to substantiate or reject the diagnostic results and storyline emerging from the other lines of supply side enquiry.

Multinomial logistic regressions of labor status show the average marginal effects on the probabilities of labor status (employed, unemployed, inactive) and include illustrations to ease the interpretation. The resulting average marginal effects over time can be combined with the findings in question 2 to verify who is faring best in terms of accessing new jobs in the growing economy.

Probit regressions are used to get average marginal effects over time for the probabilities of being in formal vs informal employment, waged vs non-waged employment, agricultural vs non-agricultural employment and public vs private waged employment. Crucially these regressions identify which types of workers are most likely to make which of the transitions in their jobs as the economy grows. Taken over time, and combined with the trends observed under question 3, changes in these marginal effects provide valuable signals of changes in the demand and supply of labor.

Mincerian regressions complement the picture and pinpoint the actual influence of factors like education, sector of work or gender on the workers income.

[8] Because migration theories hold that the employment probability-adjusted earnings differential between rural and urban areas will determine the flow of workers between rural and urban areas.

[9] Whenever possible household consumption and income deciles are calculated but if this is not possible one is taken as a proxy for the other.

6.1.What individual worker and household characteristics best explain the probability of being employed relative to unemployment and inactivity and are there any changes over time?[10]

6.2.Which worker, household, and employment characteristics are associated with the key labor market outcomes: public vs private waged employment, formal vs informal employment, waged vs non-waged employment, agricultural vs non-agricultural employment, earnings (return to education)? Are there any changes over time?

[10] Individual worker and household characteristics include gender, age, education level, marriage status, share of youth and elderly in household, size of household and number of children in household, area of household residence and region of household.

## Demand for Labor[11]

Formal private businesses drive both productivity and employment growth in the developed countries. The share of formal private sector waged employment in total employment is higher the richer the country. However, in Low Income Countries, 'informal is normal'; private sector waged employment in formal firms is a small share of total employment[12], and formal contracted employment in these firms is a smaller share still. Since most capital and value added is concentrated in these formal private sector firms, the productivity of the jobs they create is much higher than the median in the economy. For LICs and MICs important jobs challenges are how to generate more of these higher productivity formal private waged jobs, how to help more workers to access them, and how to link informal sector firms and the self-employed to the value chains or to the capital embodied in the formal private firms. If performing well, the formal private sector can be a locus for better jobs outcomes throughout the whole economy. If the formal private sector is performing badly, an economy may lack the impetus for jobs and economic transformation.

The **demand side[13]** of the standardized jobs diagnostic sets out the profile, performance, and the growth dynamics of those private firms with at least one waged employee. As with the macro section, firm performance focuses on the key jobs outcomes: labor productivity and employment, and detailed analysis is made of economic transformation (the movement of labor and capital to higher productivity activities). Firm performance is calculated both in aggregate for the firms captured in the official data, and at firm level.

The *profile of private sector firms and jobs* shows the shares of firms, the shares of employment, sales and value added in these firms, and how these have evolved over time. The shares are presented by firm characteristics of age and size, by region, by sector and by firm ownership. The profile is compared with that of other countries to identify whether there are any peculiarities which may hint at constraints.

The analysis of trends in economic transformation in the formal private sector investigates how the aggregate picture from the macro and supply analysis regarding trends in waged employment and sectoral shifts in jobs, is reflected in the country's "modern sector" firms. Most value added and most capital in most developing countries is in the large formal firms, which typically employ a low share of the workforce. Hence demand side analysis checks how capital and labor are being combined over time, whether the share of employment in the formal private sector is rising, and whether labor is moving from less to more productive sectors and locations and from less to more productive firms over time[14].

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[11] Merotto, D., Weber, M., and Aterido, R. (2019) 'Job Diagnostics' Guidelines' World Bank Group, Washington, DC. (Forthcoming). Job Diagnostics' firm-level analysis is led by Reyes Aterido.

[12] Merotto, D., Weber, M., and Aterido, R. (2018) 'Pathways to Better Jobs in IDA Countries: Findings from Jobs Diagnostics' World Bank Group, Washington, DC.

[13] The standardized analysis of firms excludes public sector employees (except those in State Owned Enterprises) and excludes the self-employed. Whereas data analysis in this section of the Jobs Diagnostic is standardized in terms of techniques, variables and data cleaning, the raw data on which it is based are not standardized internationally the way they are for the Labor Force Surveys and Living Standards Measurement Surveys. This makes global comparison less definitive. The Jobs Group sets out the underlying data sources and data compatibility issues in our analysis. There is a general assumption that the standardized analysis deals with "formal firms" though this is not always the case, and so care must be exercised in interpreting the findings.

[14] Note that a move from more to less productive sectors need not be a bad thing for better jobs outcomes if it results in a shift of labor from the "traditional" to the "modern" sector. The results of demand side analysis need careful interpretation; a relative shift in the share of modern sector employment from highly capital-intensive production (for instance mining) to more labor-intensive manufacturing can be highly beneficial if it results in a net gain in "better jobs". However, a shift in labor within mining firms from

The *firm level analysis* then seeks to deepen the aggregate findings by providing an understanding of trends in employment, productivity and wages for specific firms (e.g. new, young, old, large, micro, urban or rural). By assessing firm-level performance over time for different firm characteristics, the diagnostic approach is to look for symptoms of constraints – typically in the business environment and factor markets - which could be preventing increased productivity and job creation in the formal private sector. Specific focus is given to entry and exit of new and inefficient firms and to market shares to assess whether competition and firm selection forces are working as they should in product markets to enhance productivity. For instance, do new firms enter? Do they expand and hire? Do efficient firms survive and grow, and do inefficient shrink and exit?

The coverage of firm level analysis (how broad and which variables) depends in practice upon the data available. Most countries collect firm-level data periodically to compile the national accounts (through business registers and censuses, and through surveys). Company tax data can also be used, especially if it can be linked to numbers of workers on the payroll. Yet there is no systematic and internationally standardized approach to the collection of firm-level data, and the frequency varies a lot between countries. This means it is not always possible to conduct the same analysis across countries; some countries have panel data for firms, some may only have one point in time; some have only census data capturing sales and employment without estimating value-added. Sometimes there are data inconsistencies in the same country over time. This means that teams undertaking demand-side analysis in a jobs diagnostic have a lot of up-front data work to do. Nor are definitions standardized. This is especially the case regarding formality. Some data sets ask whether businesses are registered[15], many do not. But even if businesses are formally registered, employees in these businesses may not be permanent staff on contracts. This is an important consideration when interpreting results between the demand and supply sides of the jobs diagnostic.

### *Question 1: What is the profile of the formal private sector and how has it evolved overtime?*

First question 1.1 of the demand side diagnostic uses firm level-indicators to set out levels and changes over time in the number and shares of *formal[16] private sector firms, employment, and value added[17]* by sector, firm age, firm size, ownership structures, and spatial location.

Second the profile analyses the *concentration of sales and employment* (question 1.2). For most LICs, value added (like capital) is highly concentrated in a few big companies, and in a few big capital-intensive sectors, especially in mineral rich countries[18]. This concentration can have implications for growth in labor productivity and employment and so provides important context for questions 2 and 3 below. Question 1.2 selects the top ten sectors by their market share in manufacturing and services, provides the share of firms, sales, and jobs in

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the more productive to the less productive firms would be cause for concern, as might a job-reducing shift out of formal manufacturing firms (with access to capital) back into the (capital thin) traditional sector.

[15] Tax return data can of course be assumed to be "formal", although companies obviously have an incentive to reduce value added (because it gets taxed).

[16] The approach excludes sole traders and family businesses with no paid employees. A facet of the data used is that household-based enterprises are also excluded.

[17] Sales if value added not available. All monetary values throughout the analysis are reported in a multiple of local currency and values are deflated.

[18] Some sectors have by nature few firms; thus, concentration is not a proxy of lack of competitiveness issues. Likewise, concentration in specific sectors can be due to legitimate reasons given the country specific characteristics and degree of economic transformation.

these ten sectors (to their total in manufacturing and services), then selects the top 4 firms and provides the share of firms, sales, and jobs of these top firms in each of the 10 selected sectors.

The profile in 1.1 and 1.2 is then compared to that of other countries (question 1.3) to identity any outlier results that could offer clues about constraints to growth and employment creation in formal private firms. For instance, if firms in a stable country are significantly older on average than in other countries, this could be a signal of barriers to entry and exit. If there are very few medium-sized firms compared to other countries, and if concentration of sales and employment is exceptionally high amongst a few large firms, this could signal regulatory barriers that dissuade expansion, and which create a lack of competition for the market. These results should be interpreted alongside the symptoms from question 3. A lack of competition might for instance be associated with a movement of workers to less productive firms or if the firm-level productivity analysis in question 3 shows that larger firms are less, or becoming less, productive than new smaller firms or the average incumbent firm.

### 1.1. What is the composition of the formal private sector (firms, workers, and value added by sector, location, size, age, and ownership) and how this changed overtime?

| Indicator | Variable | Determinants | Output[19] |
|---|---|---|---|
| Share *variable* in end year. | Number of firms<br>Number of workers<br>Value added | Sector<br>Location<br>Size<br>Age<br>Ownership | Fig*ka_var*sh_sect_endyr_CCC.gph<br>Fig*ka_var*sh_reg_endyr_CCC.gph<br>Fig*ka_var*sh_sz_endyr_CCC.gph<br>Fig*ka_var*sh_ag_endyr_CCC.gph<br>Fig*ka_var*sh_own_endyr_CCC.gph |
| Share *variable* overtime. | Number of firms<br>Number of workers<br>Value added | Sector<br>Location<br>Size<br>Age<br>Ownership | Fig*kb_var*sh_sect _CCC.gph<br>Fig*kb_var*sh_reg _CCC.gph<br>Fig*kb_var*sh_sz _CCC.gph<br>Fig*kb_var*sh_ag _CCC.gph<br>Fig*kb_var*sh_own _CCC.gph |
| Number of *variable* first and end year. | Number of firms<br>Number of workers<br>Value added | Sector<br>Location<br>Size<br>Age<br>Ownership | Fig*kc_var*_sect _CCC.gph<br>Fig*kc_var*_reg _CCC.gph<br>Fig*kc_var*_sz _CCC.gph<br>Fig*kc_var*_ag _CCC.gph<br>Fig*kc_var*_own _CCC.gph |
| Total, mean, min, max, sd of N, L, VA end year | Number of firms<br>Number of workers<br>Value added | Sector<br>Location<br>Size<br>Age<br>Ownership | Table1.xlxs |

### 1.2. Which sectors hold most market power and how many workers do they employ?

[19] Figure numbers (k) are consecutive and vary depending on availability of data. For question 1.1, figure numbers are ordered by dimension.

| Indicator | Variable | Determinants | Output |
|---|---|---|---|
| 10 sectors with largest market share in manufacturing. 10 sectors with largest market share in services[20]. | Share market share<br>Share number of firms<br>Share employment | | Table2.xlxs |
| Share of four firms with largest market share of 10 top sectors in manufacturing and 10 top sectors in services[21]. | Share market share<br>Share number of firms<br>Share employment | | |

### 1.3. How does the profile of operating firms compare to other countries?

| Indicator | Determinants | Output |
|---|---|---|
| Share of number of firms and workers | Sector | Fig1_benchmark_CCC.gph |
| | Size: micro firms versus large[22] | Fig2_benchmark_CCC.gph |
| | Age: young versus old[23] | Fig3_benchmark_CCC.gph |
| Share of workers by 1 percent largest firms | | |
| Share of revenues by 1 percent largest firms | Cross-country | Fig4_benchmark_CCC.gph |
| | Cross-country | Fig5_benchmark_CCC.gph |

***Question 2: What are the trends in economic transformation and jobs in the formal private sector?***

Having described and compared the profile of formal firms, employment, and value added, the demand-side jobs diagnostic analyzes the contribution of changes in formal private sector labor productivity and employment shifts to overall productivity growth in the formal private sector and assesses whether the gains in growth in value added accrue as returns to capital or labor. This section therefore relates closely to the aggregate trends in productivity and employment in the macro and supply sections.

The most important *aggregate indicators* of formal private sector performance are total number of jobs, total value added per total employment (aggregate labor productivity), unit labor costs (total wage bill per total employment), and total capital / labor ratio. In a healthy growing economy, we would expect to see over time:

- Growth in output, value added and employment in the formal sector which exceeds growth in economy wide output, value added and total employment (i.e. the formal sector is expanding in share);
- Labor productivity growth in line with, but exceeding, growth in unit labor costs (for all firm types);

[20] And commercial agriculture if available
[21] And commercial agriculture if available
[22] Micro firms have 1 to 9 employees; large firms have 100 or more employees
[23] Young firms are 5 or less years old; old firms are 10 years old or more

- An increase in the capital / labor ratio in key high employment sectors (capital deepening across form types), unless the sector has become more labor intensive for good reasons (i.e. the removal of prohibitive labor taxes, removal of labor market distortions);
- Labor productivity rising within sectors over time; for both new and older firms, large and small firms
- Employment shifts towards the more productive (higher labor productivity) sectors;

### 2.1 How are factor shares distributed, and how has the composition evolved over time?

Question 2.1 seeks to understand how the functional distribution of income is evolving in the formal private sector[24]. This high-level indicator can act as a proxy for understanding the relative scarcity and returns to capital and labor in the formal private sector, and assessed together with trends in the capital/labor ratio (question 2.3) it can help identify whether growth in the formal private sector is labor-rich.

| Indicator | Determinants | Output |
|---|---|---|
| Capital and labor shares of value added | Year (first and end year) | Fig*k*_factor_shares_CCC.gph |

### 2.2 Is sectoral labor productivity correlated with labor and unit labor costs? What are the sectoral changes in labor productivity, labor, and unit labor costs?

Question 2.2 and 2.3 reports total employment, sales, value added, labor costs, and capital over time and by sector, location, size, age, and ownership. Figures show whether sectors with high productivity provide more jobs with higher labor cost unit. When analyzed next to the macro section 3.3, the results show the extent to which the formal private sector is driving growth, economic transformation and better jobs outcomes in the economy. Analysis of the relative changes in the aggregate indicators can also give clues about whether the business environment for private sector firms is growth-and-jobs-friendly.

| Indicator | Determinants | Output |
|---|---|---|
| Aggregate number of firms, labor, value added, labor costs, capital | Sector and year<br>Location and year<br>Size and year<br>Age and year<br>Ownership and year | Table3.xlxs |
| Labor productivity, labor, and unit labor cost[25] | Sector | Fig*ka*_bubble_CCC.gph |

[24] See Atkinson, A. B. "Factor shares: the principal problem of political economy?" Oxford Review of Economic Policy, Volume 25, Number 1, 2009, pp.3-16

[25] This is a three-dimensional figure (2 axes and size of the bubble). Depending on availability of data, the size of the bubble will be the third dimension or size of the sector measure by employment

| | | |
|---|---|---|
| Change[26] in labor productivity, employment, and labor share of labor cost | Sector (first year to end year) | Fig*kb*_bubble_CCC.gph |
| Change[27] in labor productivity | Sector 2-digit (first year to end year) | Fig*ka*_prod2_CCC.gph |
| Change[28] in employment | Sector 2-digit (first year to end year) | Fig*kb*_prod2_CCC.gph |

## 2.3. Is growth in labor productivity in the formal sector coming from gains within sector, or from labor movements between sectors?

| Indicator | Determinants | Output |
|---|---|---|
| Decomposition of aggregate labor productivity (in within and between contributions) | Sector | Fig*k*_decomp_CCC.gph |

## 2.4. Are sectors increasing their capital stock and capital intensity?

Question 2.4 taken together with question 2.1 helps the analyst to understand whether growth in the formal private sector has been capital or labor intensive.

| Indicator | Determinants | Output |
|---|---|---|
| K trend | Sector[29] and year | Fig*ka*_ktrend_CCC.gph |
| K/L ratio trend | Sector[30] and year | Fig*kb*_ktrend_CCC.gph |

[26] This is a three-dimensional figure (2 axes and size of the bubble). Depending on availability of data, the size of the bubble will be the third dimension or size of the sector measure by employment
[27] This is a scatter plot looking at changes in more disaggregated sectors (2-digit).
[28] This is a scatter plot looking at changes in more disaggregated sectors (2-digit).
[29] Major sectors: manufacturing, and services (commercial agriculture if available)
[30] Major sectors: manufacturing, and services (commercial agriculture if available)

*Question 3: What is the pattern and trend in firm level growth dynamics and jobs outcomes by firm type?*

The purpose of the firm-level section of the demand side analysis is to identify which types of firms and which firm dynamics (entry, exit, growth and shrinkage) are behind the trends observed in section 2 in the jobs outcomes of labor productivity and employment[31].

The questions and the techniques applied are taken from industrial organization theories and applied studies. For instance, empirical literature suggests that reallocation of resources between firms within a country (through processes of firm selection) can be as important to total productivity gains as from innovation (productivity catch up by firms with the industry frontier, i.e. through spillover effects).[32] This section of the demand-side diagnostic therefore; (i) calculates the effects on jobs outcomes of firm entry, exit, growth and shrinkage; (ii) identifies which firm types enter, exit, grow and shrink (i.e. the drivers of jobs outcomes); and (iii) how the entry and exit rates compare with other countries.

Since literature[33] also suggests that new micro firms tend to grow the fastest, that most firms grow or exit within their first 5-10 years, that older firms tend to increase profitability by economizing on costs, and that agglomeration effects are important, this section of the demand side analysis specifically looks at whether micro firms grow, whether older firms are larger on average (employment size), whether older and larger firms have higher labor productivity, and whether certain locations are associated with better labor productivity and employment outcomes. Where possible, the results for the country are compared to other countries.

Interpretation of the symptoms in this section can be important in identifying policy, regulatory and investment constraints to more and better jobs in the formal private sector. For instance, a country with low rates of entry may face barriers to entry or competition or high start-up costs (for instance financing); a country where older firms are not larger may face constraints in the investment climate; countries with widening patterns of labor productivity may lack spillover learning effects.

### 3.1. Are firm labor productivity[34] and wages[35] rising across the distribution of firms? In which sectors and locations has average labor productivity and wages increased most? How firm's labor productivity correlates with firm's wages?

Unlike section 2 where sectors ranks were determined by their aggregate labor productivity and wage, this section looks at which sectors or regions have the highest firm's average labor productivity and wage. The structured enquiry starts by observing how labor productivity and wage changes from the beginning to the

[31] Indicators in this section are averages of firm level. As such, patterns may differ from section 2. Moving down to the firm level gives clearer understanding of what is driving the changes observed.
[32] See for example Tsieh, C. and Klenow, P. (2009) "Misallocation and Manufacturing TFP in China and India", The Quarterly Journal of Economics, Volume 124, Issue 4, 1 November 2009
[33] Syversson, C. (2011) "What Determines Productivity?" Journal of Economic Literature 2011, 49:2, 326–365
[34] Labor productivity is firm's VA/L (or output if value added not available).
[35] Wage is the unit labor cost, a proxy of firm's average wage (our default is permanent employees because in most cases weighted measure of temporary workers is not available.) Average wage is likely tilted towards firms with larger share of temporary workers. The difference in average wage is found to be small when temporary workers are included (weighted by days worked).

end of the period. It first looks at changes in average labor productivity (and wage) in each decile of the distribution and compares the average value of each decile in corresponding year. This indicates where in the distribution firms became less or more productive (lower or higher wages). Second, it looks at the changes in the density distributions. If the distribution moves to the right, firms have become more productive (increased average wage). Whether there are more firms in the right or left tail, or whether the distribution becomes more or less dispersed, are also indications of how performance evolved over the period. For the last year of the period, densities are also examined by different firm types. What firm characteristics are associated with employment size, labor productivity levels and wages? Put more simply, which firms have the highest labor productivity, and do they tend to pay higher wages? It also plots firm's and wages to derive from the correlation whether higher firm productivity is associated with higher wages, and whether firms are operating with higher margins. Compliance with minimum wage regulations can be derived if this is plotted.

| **Indicator** | **Determinants** | **Output** |
|---|---|---|
| Average firm labor productivity distribution | Decile and year (first to end year) | Fig*ka*_lpdec_CCC.gph |
| Average firm wage distribution | Decile and year (first to end year) | Fig*kb*_wgdec_CCC.gph |
| Average firm labor productivity density | Year (first to end year) | Fig*ka*_lpdens_yr_CCC.gph |
| Average firm wage density | Year (first to end year) | Fig*kb*_wgdens_yr_CCC.gph |
| Average firm labor productivity density | Sector (end year) | Fig*ka*_lpdens_sect_CCC.gph |
| Average firm wage density | Sector (end year) | Fig*kb*_wgdens_sect_CCC.gph |
| Average firm labor productivity density | Region (end year) | Fig*ka*_lpdens_reg_CCC.gph |
| Average firm wage density | Region (end year) | Fig*kb*_wgdens_reg_CCC.gph |
| Average firm labor productivity density | Size (end year) | Fig*ka*_lpdens_sz_CCC.gph |
| Average firm wage density | Size (end year) | Fig*kb*_wgdens_sz_CCC.gph |
| Average firm labor productivity density | Age (end year) | Fig*ka*_lpdens_ag_CCC.gph |
| Average firm wage density | Age (end year) | Fig*kb*_wgdens_ag_CCC.gph |
| Average firm labor productivity density | Ownership (end year) | Fig*ka*_lpdens_own_CCC.gph |
| Average firm wage density | Ownership (end year) | Fig*kb*_wgdens_own_CCC.gph |

| | | |
|---|---|---|
| Firm's average labor productivity | Sector and year (first and end) | Fig*ka*_avlp_sect_CCC.gph |
| Firm's average wage | Sector and year (first and end) | Fig*kb*_avwg_sect_CCC.gph |
| Firm's average labor productivity | Region and year | Fig*ka*_avlp_reg_CCC.gph |
| Firm's average wage | Region and year | Fig*kb*_avwg_reg_CCC.gph |
| Firm's labor productivity and wage | End year | Fig*k*_lpwg_CCC.gph |

### 3.2. Which sectors and locations have greater dynamism proxied by entry and jobs created at entry?

Outputs in this question refer to the distribution of entry and jobs created at entry by sector and region. Sectors and regions with a buoyant private sector will have higher entry with more jobs created at entry. Whilst higher entry, but relatively lower jobs created at entry, indicates a high share of small firms entering the market. Few new large firms can revitalize a region boosting the demand for products due to the additional formal jobs generated. Because entry can be cyclical with different peaks in sectors and regions, looking at how entry evolves over time, allows to assess patterns and identify lagging bundles. Gauging the potential and barriers of both strong and poor performers provides evidence to formulate the right policies.

| **Indicator** | **Determinants** | **Output** |
|---|---|---|
| Share of new firms | Sector and year | Fig*ka*_en_sect_CCC.gph |
| Share of new jobs | Sector and year | Fig*kb*_Len_sect_CCC.gph |
| Share of new firms | Region and year | Fig*ka*_en_reg_CCC.gph |
| Share of new jobs | Region and year | Fig*kb*_Len_reg_CCC.gph |
| Entry rates | Cross-country | Fig*k*_benchmarking_CCC.gph |

### 3.3. What firm characteristics[36] predict firm's size, labor productivity, and wage?

Regression analysis[37] allows to estimate the contribution of certain firm characteristics to an outcome while all other characteristics are hold constant. Although, causality is not claimed here, the analysis yields a more robust way of measuring correlations. Although, these regressions are cross-sectional, in the absence of panel data some suppositions can be inferred. For example, a firm that learn by doing becomes more productive as it ages, expands as it becomes more productive, and increases wages as it becomes more productive. Thus, if age coefficients are monotonically

[36] Size, age, ownership, efficiency of capital, sector, and location.
[37] Standard errors are clustered by broad categories of size, sector, and location.

positive in size, productivity, and wages regressions, this would be consistent with a virtuous development in the life of the firm. If more productive firms are not larger is suggestive that they do not expand possibly due to market failures (i.e. constraints in finance, supplies, skills, logistics or regulations, etc…) Estimations also tests the efficiency in the use of capital and assess which are the best performers in terms of jobs, productivity and wages. A benchmarking exercise compares the lifecycle of the firm (proxied by the average size of the firm as it gets older) evaluating whether it is healthier in the country under study.

| Indicator | Determinants | Output |
|---|---|---|
| Determinants of firm's size | age, ownership, efficiency of capital, sector, and location | Fig*k*_reg_L_CCC.gph<br>Regressions_JDD_CCC.xlxs |
| Determinants of firm's productivity | size, age, ownership, efficiency of capital, sector, and location | Fig*k*_reg_P_CCC.gph<br>Regressions_JDD_CCC.xlxs |
| Determinants of firm's wage | size, age, ownership, efficiency of capital, productivity, sector, and location | Fig*k*_reg_W_CCC.gph<br>Regressions_JDD_CCC.xlxs |
| Average employment size of the firm by age | cross-country | Fig*k*_benchmarking_CCC.gph |

## 3.4 Do workers move to more productive firms?

Outputs test for possible signs of misallocation by undertaking static productivity decompositions[38].

The decomposition techniques show the contributions to productivity through reallocation. A positive covariance identifies higher labor shares labor in more efficient firms. Trend overtime indicates whether reallocation is being gainful.

| Indicator | Determinants | Output |
|---|---|---|
| Covariance decomposition of aggregate productivity | Sector (j) and year | Fig*k*_OP*j* _CCC.gph |
| Covariance decomposition of aggregate productivity | Sector (sector 2-digit) and year | Table 4 |

[38] Olley-Pakes

## 3.5 Do firms grow[39]? Which ones? Which firms create/shed jobs?

Whether firms grow can be only assessed with a panel structure where firms are observed over time. A common objective for countries is to put their limited resources to support activities, locations and types of firms with highest potential to boost the economy. Incentives to small firms becomes a dilemma since the formal private sector is plagued by micro firms often with less skills and wages. Because of the limit access to panel data, the first output under this question benchmarks the share of young micro firms. If the proportion of older micro firms is relatively large, is an indication that those small firms tend to not grow.

When panel data is available, a more thorough analysis allows to identify whether firms grow, in which sectors and locations, and what type of firms. Outputs address these questions in a variety of ways. First looking at the job flows overtime and to determine job creation, destruction and net job creation. High churning can suggest creative destruction or stagnation. Net job creation could be due to incumbents or entrants. Different sectors and regions contribute in different degrees. Transitions are also examines looking at what firm's size are more likely to upgrade.

| **Indicator** | **Determinants** | **Output** |
|---|---|---|
| Share of young/old micro firms | Country | Fig*k*_benchmarking_CCC.gph |
| Share of firms transitioning size | Size | Table 5 |
| Job creation, destruction, net creation | Incumbents, new, exit and year | Fig*k*_flows_CCC.gph |
| Net job creation | Sector and year | Fig*k*_njc_sect_CCC.gph |
| Net job creation | Region and year | Fig*k*_njc_reg_CCC.gph |
| Net job creation | Size and year | Fig*k*_njc_sz_CCC.gph |
| Net job creation | Age and year | Fig*k*_njc_ag_CCC.gph |
| Net job creation | Ownership and year | Fig*k*_njc_own_CCC.gph |

## 3.6 What firm characteristics predict firms' employment growth, productivity growth, and wage growth? What firm characteristics predict firm's exit[40]?

[39] It refers to employment.
[40] Probit regressions reporting marginal effects.

This final section of the demand-side firm-level analysis is undertaken where firm-level panel data exists. It estimates employment, labor productivity and wage growth through regression analysis[41]. Thus, holding all other firm characteristics constant. Likewise estimates the determinants of probability of exit. Where more productive firms more likely to exit, would provide evidence of market failure.

| Indicator | Determinants | Output |
|---|---|---|
| Determinants of employment growth | Average size, age, ownership, capital, labor productivity, sector, location, and year | Fig*k*_reg_Lg_CCC.gph<br>Regressions_JDD_CCC.xlxs |
| Determinants of productivity growth | Average size, age, ownership, capital, sector, location, and year | Fig*k*_reg_Pg_CCC.gph<br>Regressions_JDD_CCC.xlxs |
| Determinants of wage growth | Average size, age, ownership, capital, labor productivity, sector, location, and year | Fig*k*_reg_Wg_CCC.gph<br>Regressions_JDD_CCC.xlxs |
| Determinants of firm's exit | Size, age, ownership, capital, productivity, sector, location, and year | Fig*k*_exit_CCC.gph<br>Regressions_JDD_CCC.xlxs |

## ANNEX

| Indicator | Variables | Dimension | Output |
|---|---|---|---|
| Count, average, median, standard variation, minimum, maximum | Employment, age, productivity, average wage, sales, wage bill, capital | year | Table A1 |

[41] Random effects model where panel nature of the data is accounted for. Standard errors are clustered by broad categories of size, sector, and location.