Sectoral engines of job-rich growth:

Some lessons from ILO sectoral country studies

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Job-rich Growth and Sectoral Policy: Some analytical tools

Poverty Reduction Strategies (PRS) always outline a strategy to promote growth while countering pervasive unemployment, underemployment and poverty. From the perspective of the macroeconomic policy, guiding principles are given by the IMF structural adjustment and macroeconomic guidelines (see article 4 or IMF's Poverty Reduction Growth Facility), which delineates fairly tight macroeconomic goals, conditions, and benchmarks that are to be followed by monetary policy, fiscal policy, exchange rate management, and financial regulation.

This orthodox macroeconomic policy framework embedded in PRSs is *de facto* a major binding constraint to development polices in general and employment policies in particular. Thus, a key question one should ask is this: is the IMF macroeconomic framework the best one to use to achieve MDGs goals? More specifically, are the programs and targets embedded in the IMF supported programs consistent with achieving national goals with respect to economic growth, poverty reduction and job creation? More generally, what is the best macroeconomic framework to use to increase the likelihood that PRSPs objectives will be reached?

Along these lines, an effective development strategy calls for expanding sectors that generate a lot of value added and employment, and have large multiplier effects and linkages to the domestic economy. To that aim a better understanding of the national economic structure is needed (the sectors that generate value-added, employment, multipliers, and linkages). And the best way to improve our understanding of these structures is to build a data-based model of the economy which illuminates these underlying structures and connections.

Input-output (I-O) models provide the most complete picture of the economy as a whole. They are a powerful tool for analyzing inter-sectoral relationships and for assessing the national productive system. I-O models enable us to derive sets of disaggregated multipliers, recognizing that the total impact on output (income or employment) will vary according to the sector which experiences the initial increase in demand. The main input for constructing the multipliers is the matrix of interdependence coefficients (also know as the Leontief inverse matrix), which shows how much of each industry's output is required, in terms of direct and indirect requirements, to produce one unit of a given

industry's output. Multiplier analysis is useful to determine the total impact on an economy (State or substate region), of some change caused by an external force or decision. In disaggregated form, these calculations would tell us how much output of industry X would increase if final demand for the output of industry Y were to grow by 1 dollar (or, to make the magnitudes more reasonable for analysis, 1 million dollar). Then each of these industry specific multipliers where multiplied by the employment-output ratio for the industry in question. This converts the output multipliers to employment multipliers.

The purpose of theoretically mapping out the various channels of sectoral contributions to overall growth and job creation is to provide a basis for analyzing the differential contributions of different sectors of a domestic economy and formulate an appropriate macroeconomic and sectoral policy to support priority sectors. Indeed, some sectors have traditionally been regarded in the development literature as having special "employment-pulling" and/or "growth-enhancing" properties. It is crucial to determine the channels through which growth in a sector of the economy can raise or support aggregate employment creation and economic growth in the rest of an economy.

One can identify some major channels of sectoral contribution to overall growth and job creation (and some associated binding constraints):

- Backward linkages to the rest of the domestic economy: It creates additional demand for the output of upstream sectors. The impact will be determined by its degree of upstream vertical integration with the rest of the economy (including their own backward linkages and so on)

- Forward linkages to the rest of the domestic economy: i) It creates additional demand for the output of downstream sectors (transportation, transformation industries, etc) and ii) it lowers the cost of its output and output price which goes into intermediate inputs for downstream sectors The impact will be determined by its degree of downstream vertical integration with the rest of the economy (including their own backward linkages and so on)

- Compositional effects: Growth in a sector with higher (marginal) productivity than the economy wide average would raise aggregate productivity.

- Trade: When a sector is a net generator of foreign exchange (depending of the level of dependence on imported intermediate inputs) it can facilitate a reallocation of resources across the economy in a manner that support higher growth.

- Employment: Wages are a component of domestic demand. A higher wage bill in a sector can have growth-inducing effects by increasing domestic demand ant thereby raising the level of resource utilization. Higher employment can also contribute to increase the fiscal space (through taxes on wages, income and consumption) as well as reducing the burden of social security and health on the state. The employment multiplier and composition of the wage bill of a specific sector are two key elements for explaining the direct and indirect impact of a sector growth on growth and employment. Indeed, employment of a greater number of low paid jobs or employment intensive sectors are likely to have a higher positive effect of domestic demand

- Saving: Surplus in a sector (if retained domestically) can contribute to aggregate savings which can feed into investment elsewhere in the economy, providing the basis for accumulation and growth.

- Fiscal: Sector's tax payments, net of subsidies to the sector can contribute to additional growth through increased fiscal space and appropriate public investment.

Based on this approach, an identification of what the primary constraints on growth and job creation are at any particular conjuncture can allow for the prioritization of sectors that are especially relevant to inducing or supporting a job-rich growth. When the objective is to improve employment outcomes, we would want to target productive sector that would have high value-added multipliers or employment multipliers. Using Input-Output models could allow us to indicate sectoral investments that are more likely to generate demand for employment, either directly and/or indirectly through linkage effects. For Moreover, on financial markets and institutions, we could use these data to show that the current allocation of credit in the economy is not well suited to expand investment in sectors having high multipliers. It could provide strong evidences that there needs to be some major reforms in the financial sector to allocate funds to areas that will have larger effects on poverty reduction and sustainable increases in decent jobs.

From this perspective, the Employment Policy Department has launched some sectoral studies using input-output tables to investigate intersectoral linkages and identify priority sectors for job-rich growth. Some results from those ILO country studies (Gabon and Madagascar) will be presented in the last section)

Crisis Impact assessment at sector level

The impact of an external crisis is seldom uniform across the entire economy, but may often affect one or several economic sectors particularly severely. The sector impact will *inter alia* depend on the nature of the transmission channels. In many countries declining export earnings is a main transmission channel. The impact through this transmission channel is typically rapid and may be quite dramatic on the export sectors concerned. Sectoral analysis shows that all job loss is not alike, in terms of its effects on the wider economy. Employment multipliers support the proposition for sectoral policies as layoffs in some sectors tend to have much larger spillover effects in terms of indirect employment loss than layoffs in other sectors. Employment multipliers provide one more dimension to the rapid assessment framework the ILO has developed which is that along that some sectors are crucial for the wider economy, some sectors generate more secondary employment than other sectors and, as a consequence, sectoral policies should target those sectors to limit the spilling over of the crisis to the domestic labour market.

Sector analysis aims at assessing the employment impact of the crisis in the sector in question as well as expected secondary effects through linkages between the sector and the rest of the economy. Thus one aspect of the assessment concerns the direct sector-specific employment impact in the sector(s) affected by the crisis. Another important component of the assessment

focuses on charting and quantifying the transmission of the impact from the specific sector to the rest of the economy as, over time, the impact on the particular sector(s) affected will spread to the rest of the economy through backward and forward linkages and through a fall in incomes and demand.

The transmission of the impact can take three principle forms:

- Direct impacts are the immediate effects of declining production in the initially affected sector.
- Indirect impacts are the effects on other sectors as a result of falling purchases of inputs by the initially affected sector.
- Induced effects are the changes in other sectors brought about by the decreased consumer spending due to the initial direct and the following indirect effects.

The sector analysis should aim at providing some specific policy recommendation to formulate:

1. Targeted sectoral policies which mitigate the spill-over effect of the crisis on to the wider economy, accounting for the fact that some sectors tend to have much larger spill- over effects in terms of direct and indirect employment losses than other sectors.
2. An integrated policy response that can have a rapid impact on the well-being of those who are dependent on sectors that are particularly seriously affected by the crisis.
3. A sector-level policy supporting the development of sectors with a high potential in terms of income and employment generation within the whole economy.
4. Supporting policies in the medium and long term to develop backward and forward linkages of key sectors.

The Madagascar country study

Using an Input-Output model, the study identifies a number of key sectors where more investment could generate greater employment and incomes[1]. These include: agriculture, fishing, recreation services, among others. Using the I-O model, the study also identifies the impacts on employment and wages of improving domestic upstream linkages, including in hotels and tourism and the extractive industries.

One of the striking conclusions of the study is that the financial system must be part of the solution: proper allocation of credit can help raise productivity in the agricultural and export sectors, and generate jobs and higher incomes outside of agriculture, including increasing backward and forward linkages throughout the economy. And the macroeconomic framework needs to be modified if it is going to contribute sufficiently to achieving MDGs goals.

[1] Epstein, G., J. Heintz, L. Ndikumana and G. Chang, Employment, 2010, *Poverty and Economic Development in Madagascar: A macroeconomic framework*, Employment Working Paper, no.58 (Geneva: ILO)

It is crucial to increase the policy space to allow government and central banks to undertake appropriate policies, such as loan guarantees, direct lending, and asset backed reserve requirements that can make financial assets more directly available to small producers and businesses in key sectors, including agriculture and that can counter some of the negative consequences of real exchange rate appreciation.

According to econometric estimates, greater access to capital could substantially enhance earnings of households. Running a basic earnings equation using the household survey, the study finds that a 10 percent increase in access to capital is associated with more than a 3 percent increase in earnings on average for households forming enterprises. Mobilizing financial resources and allocating them to productive units in key sectors could be a crucial component of the development path for Madagascar.

One of the reasons for the variations in the size of the multipliers, particularly the output multipliers, is that different industrial sectors have different linkages to the domestic economy. Some sectors will have a large number of "upstream" linkages to other activities – meaning that they utilize a large amount of domestically produced inputs in their production processes. Others have "downstream" linkages – their outputs are used by other domestic firms to produce final goods and services. Industries may have weak multipliers when they import the inputs used in production. This is one of the principal leakages that occurs in a standard I-O model.

Sectors with strong upstream linkages include livestock, finance, business services, and communications. Sectors with strong downstream linkages include extraction industries, livestock, construction materials, and insurance. We would expect the upstream and downstream linkages to contribute to higher output multipliers for these sectors. The employment and value-added multipliers will also be influenced by the density of domestic linkages, although other sector-specific factors (e.g. the labor intensity of production, technology, and the level of productivity) will influence the size of these effects. Meanwhile, results show that a number of sectors, primarily in manufacturing, rely on imported inputs into production: paper products, energy, chemical, rubber and plastic products, and metal and stone-working. Import leakages will reduce the impact any expansion of these sectors would have on the overall domestic economy. For example, although the paper sector has relatively strong downstream linkages to other sectors of the Malagasy economy, its reliance on imported inputs into production reduces the domestic impact of this sector.

The Gabon country study

The main results of the input-output analysis, may be summarized as follows:

- The economic structure of Gabon is not enough diversified. Primary sector contributes to 58.5% of GDP (2004) with the Oil subsector generating 87% of this contribution. More important, the oil sector is very weakly integrated with the rest of the economy. This is explained by the fact that the oil sector uses few factors of production and domestic inputs as well as capital and financial services which are imported from abroad. As a consequence the overall production multiplier for Gabon is 1.37 which is low and reflects the lack of upstream and downstream vertical integration of the "growth-pulling" sector.

- Classified according to their direct and indirect effects on the production, the key sectors of the economy are: wood and furniture industry, transport, construction, production and distribution of water and electricity, hotels, bars and restaurants.

- In terms of employment multipliers, top sectors are: Post and telecommunications, Production of crude oil and natural gas, Educational services and health, Oil refinery, Wood and furniture industries and construction and public works. However, it is necessary to take also into account other criteria, in particular the weight of the sector in total employment, the other multipliers and effects, the productivity and the quality of jobs.

- In absolute terms, it is public administrations' spending which turns out to be the most employment intensive, in front of household consumption, exports and finally investments. This is mainly due to the effect direct employment which turns out more important for the spending of the administrations and the household consumption than for the other constituents of the final demand. Nevertheless, taking into account indirect effects, results show that they are relatively more important for investments and exports, where multipliers are, respectively, close to 1,7 and 1,5, while it is 1,2 for households' final consumption and public administration spending.

- Thanks to the technique input-output, it was possible to analyze income generated by the economy by proceeding to the calculations of income multipliers. Total income multiplier for the overall economy is 1,3 which is very weak. It is the lowest for the agriculture sector with 1,04. This sector thus remains a bad generator of income in the other sectors as it is poorly integrated with the rest of the domestic economy with a production multiplier of only 1.17. The wood industry and the infrastructures, are sectors which generate more income with income multipliers of 2,2 and 1,89 respectively, with also more direct and indirect jobs.

Further reading

Bensaïd Mohammed, Aomar Ibourk et Ayache Khellaf, 2010 (forthcoming), *Évaluation des emplois générés dans le cadre du DSCRP au Gabon*, Employment Sector WP Series (Geneva : ILO).

Epstein, G., James Heintz, Léonce Ndikumana, and Grace Chang, 2009, *Employment, Poverty and Economic Development in Madagascar: A Macroeconomic Framework*, Employment Sector Working Paper Series (Geneva: ILO).

ILO, 2009, Country Level Rapid Impact Assessment of Crisis on Employment (Geneva: ILO).