



A New Jobs Data Tool: Introducing BuDDy – a Business Diagnostics and Dynamics Tool

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Key Messages¹

- The BuDDy tool uses formal sector business data that governments already collect to analyze patterns and trends in employment and diagnose constraints to growth and job creation.
- BuDDy gives governments the understanding of business dynamics needed to develop policies that help businesses create jobs.
- BuDDy quickly and robustly identifies the types of firms that are growing, hiring, investing, raising productivity, and raising real wages, and does this at the national or regional level, or by product.
- BuDDy is simple and adaptable; it has been developed with varying data sets, and can be linked to spatial information, trade data, and household data sets.

Introduction

Policy makers around the world want more and better jobs for their citizens. Both emerging and industrial countries that lost jobs in the global crisis now confront jobless recoveries. The “Arab Spring” of 2011 brought to light the imperative of job creation for predominantly young populations. Demographics suggest that urbanization and underemployment in the next generation of youth could be even more pronounced in sub-Saharan Africa. In Eastern Europe, out-migration and aging has caused labor markets to shrink and participation to fall, and the lack of competitiveness has led businesses to shed workers, adding to the out-migration. Even faster growing economies like

China’s have an inclusive growth agenda, as they are faced with disparities in job opportunities and wide inequality. The World Bank’s *World Development Report 2012* puts jobs at center stage. Policy makers are thus in critical need of data, facts, and advice on what to do to help stimulate jobs for prosperity in their countries.

Clearly, to make informed decisions about policy priorities for job creation, the necessary information must be available. The most often used and commonly available source of information comes from the World Bank’s Household Labor Force Surveys (LFS), which are linked to the living standards surveys (LSS). These surveys, which look at workers and not firms, provide insights on how jobs help households rise out of poverty. The Business Diagnostics and Dynamics Tool (BuDDy) complements this analysis with detailed information from formal sector firms, giving demand-side insights into how, why, and where “good jobs” are created and lost in the economy. BuDDy was created by staff originally working in the Africa (AFR) and Europe and Central Asia (ECA) Poverty Reduction and Economic Management (PREM) units. Currently, the PREM Anchor is expanding this work so that World Bank teams can help meet this demand for precise information on job creation country-by-country.

How does BuDDy Work?

BuDDy processes readily available data, applying standard diagnostics from the growth literature. In most countries, the data to help understand job creation and growth have already been collected, but are not being used. National accounts surveys that are collected by statistical agencies to estimate GDP on a value-added basis take operating statements from firms in order to estimate sales, costs of sales, profits, labor costs, and other indirect costs for the economy. To generate an investment series for the national accounts, statisticians also collect information on trends in gross fixed capital formation from businesses. These surveys and the census from which samples are drawn typically collect information on how many workers a firm

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employs. All of these sources of data are combined across years in a BuDDy. Ideally, this data will, in time, be standardized with growth analysis in mind, just as household LSS are increasingly becoming standardized. For now, there is a treasure of data across countries to be mined and explored. As a tool for making the most of existing data, BuDDy costs very little and offers much.

The nature of the data used for BuDDy means it is country-specific. Some statistical agencies collect business registers (censuses) that record basic data for every registered firm. Where firms are matched over time periods, this allows for a comprehensive analysis of entrants, exits, growth, and sector concentration. Some agencies conduct annual surveys, following a few of the same firms over time, usually providing more detailed operating statements and cost data, or detailed financial statements and balance sheets. Some collect the bare minimum to generate GDP value added growth for the national accounts.

Data on each business are used to generate standard labels and variables for analytic insights. All surveys include *intrinsic characteristics* about a business: where it is located, who owns it, what product(s) it produces, how old and how large it is, etc. Surveys also include current data on the *intrinsic conditions* of the business: its sales, costs, profits, employment numbers, etc. When available over time, these intrinsic data are used to generate *derived conditions* such as growth rates, productivity, profitability ratios, returns to capital, costs of capital, average wages, capital/labor ratios, and so forth. A combination of characteristics and derived conditions is then used to label and differentiate businesses with *derived characteristics* — for instance, growing vs. shrinking firms, efficient vs. inefficient, productive vs. unproductive, profitable vs. loss-making, high vs. low return, old vs. new, entrants vs. established firms. Businesses are thus labeled based on their *product characteristics*, that is, producers are differentiated based on whether they produce traded or nontraded goods, or products that are “monopolistic” as defined by their concentration coefficient, or “competitive.” Finally, other product characteristics are incorporated, such as a firm’s technology content or export sophistication.

These dynamic conditions and characteristics are then used by the BuDDy tool to understand inclusive growth. Policy makers don’t just need to know the average growth rate of employment in an economy, they need to know the patterns, conditions, and characteristics of the firms that are hiring and those that are not. BuDDy allows users to contrast hiring firms from firing firms. Are hiring firms investing? Are their sales rising? Are they more efficient and profitable? Is their productivity higher than that of firing firms? Do they pay higher wages if it is?

Getting a Good Diagnosis

Facts are collected using BuDDy to enhance the analyst’s diagnosis of the economy. A good diagnosis starts with whether the observed symptoms of growth and job creation reflect those of a *healthy* economy. With BuDDy, some standard tables and charts are made that allow the user to identify facts about growth dynamics. Is there churning; i.e., do efficient firms grow, and do inefficient firms shrink? Is there entry and exit, and do entrants tend to have higher than average productivity? Do growing firms hire, and do shrinking firms fire staff? Are profits and job creation significantly higher for efficient and more productive firms? Are firms with rising productivity hiring and investing? Is the spatial pattern of new business location and growth as expected?

BuDDy is designed to be simple and flexible. Users can arrange data using different combinations of intrinsic characteristics and conditions, or choose (using filters) any specific firm or product characteristics. For instance, users of Moldova’s BuDDy can filter the data to focus only on efficient firms in manufacturing; they can then drill down to look at job losses in any given district by firm ownership and age. Alternatively, a user could investigate the returns to and costs of capital for efficient and inefficient firms, and then check whether this pattern holds across firm ownership, age, and sectors. The tool comes with a user manual, and Bank teams are providing growth diagnostic training on how to develop and use it for counterparts in countries that have made their data available.

The firm surveys used to create BuDDy are generally much larger than those collected in Business Environment and Enterprise Performance (BEEPs) and International Investment Climate (ICA) surveys. Moldova’s BuDDy, for example, created a panel of 17,000 firms from 2004 to 2010; Ukraine’s panel is made up of 37,000 firms, and the data panel for Romania is 102,000. In Uganda, there are two censuses a decade apart; the 2001 Census contains 166,000 firms, the 2010–11 Census has 450,000, and the Uganda national accounts survey for 2001 draws a sample of 4,400 firms from the census. Armenia’s national accounts survey of around 6,000 firms creates a panel of 402 firms over five years; though it covers fewer firms, the survey collects business costs in great detail.

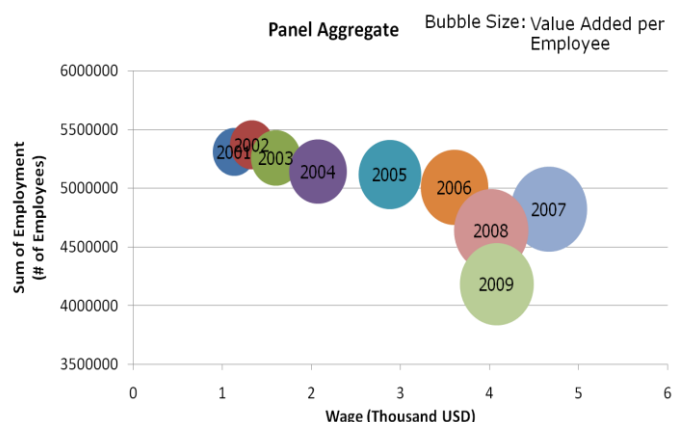
For the ECA BEEPs BuDDy tool, there are 22 countries for which panel data are available for 2004 and 2007 in surveys averaging roughly 400 firms per country. The surveys contain rich information on investment climate constraints, but the lack of financial capital and data on gross fixed capital formation means that returns to capital and production functions cannot be derived. Our pilot work

suggests that despite the variety in data contexts, BuDDy has a lot to offer policy makers.

What Can BuDDy Do for You?²

Trend analysis: Who is creating jobs, in which sectors and where? With the click of a button, BuDDy provides an accurate view of which types of firms created jobs and where. And it can generate facts about the drivers of job creation. Standard tables show trends in employment and labor productivity broken down by location, ownership, firm size, and sector or product. Figure 1, for example, shows the trends in employment, wages, and value added per employee for firms in Ukraine's data panel. What stands out is that Ukraine exhibited growth in value added with job destruction and rising wages prior to the global crisis. Since then, however, wages and employment have been hard hit.

Figure 1. Trends in Employment, Wages, and Value Added in Ukraine



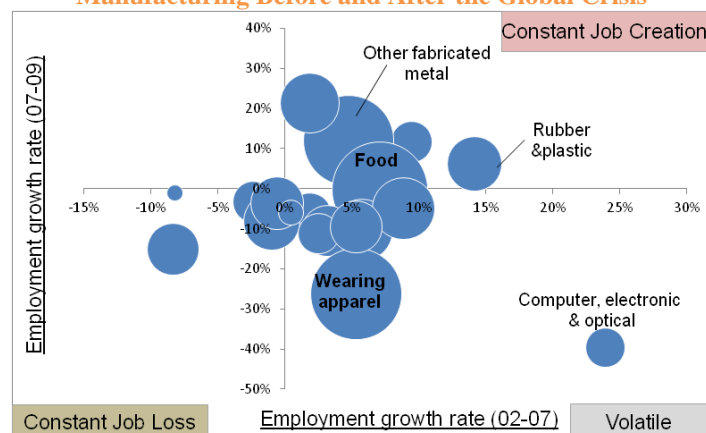
Source: BuDDy team calculations (Kongchanagul 2012) based on the Ukraine Amadeus database.

How was job creation affected by the crisis, and who was worst affected? Figure 2 shows the growth rates of manufacturing employment for a panel of Romanian firms before and after the crisis. At the level of products, it is possible to distinguish some that remained robust during the crisis, and others that were much more vulnerable to volatility in employment. Fabricated metal and food manufacturing stand out as both robust and important sectors in the job market in Romania.

Are there regional patterns to employment growth or wages? BuDDy allows us to consider levels and changes in labor productivity, wages, and employment across regions in a country. This can be done by sector and by firm type, for instance, to check whether there may be persistent

lagging regions in relation to productivity or value added (figure 3).

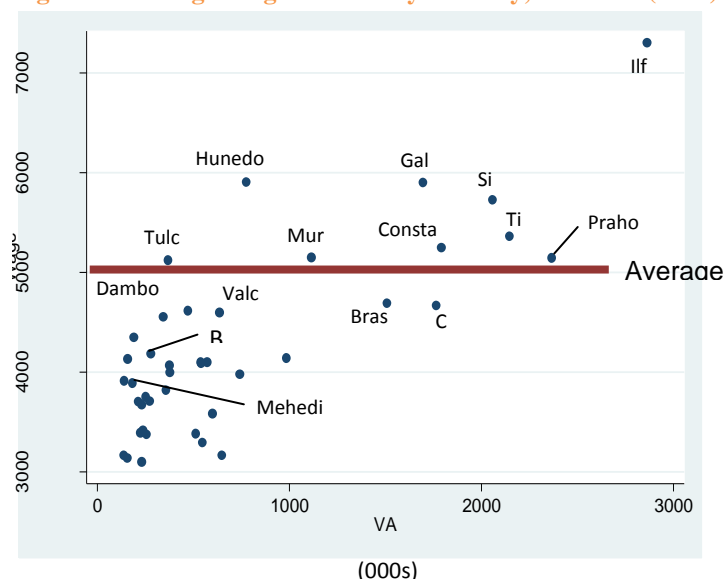
Figure 2. Romania: Job Creation and Destruction in Manufacturing Before and After the Global Crisis



Source: BuDDy team calculations (Kanematsu 2012) based on the Romania Amadeus database. Bubble size is employment in 2009.

Inclusive growth diagnostics: Do efficient firms grow, and do growing firms hire? Inclusive economic growth requires that they do. Otherwise the dividends of growth go not to the lower and middle classes but as returns to investors. BuDDy can be used to quickly check whether firms that are investing and expanding are the most productive in terms of output per worker. If they are, do they hire additional workers as they grow? Figure 4 shows that whereas efficient firms in Moldova *do* grow faster than inefficient firms, they do not (on average) hire as they grow. This pattern holds across the whole country. In the cities, the difference in hiring and firing between efficient and inefficient firms is negligible.

Figure 3. Average Wage/Worker by Country, Romania (2006)



$$R^2 = 62\%$$

$$p \text{ value} = 0$$

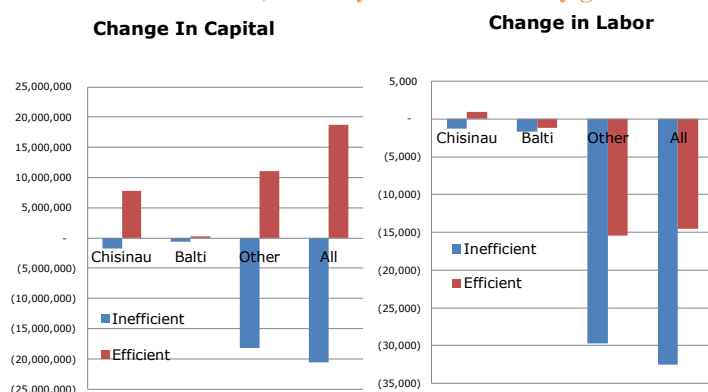
$$Y = 3517.56 + 1.02X$$

Source: Kanematsu, 2012, based on Romania Amadeus database.

² This section uses work of the broader BuDDy team: Apirat Kongchanagul, Kosuke Kanematsu, and Tao Huang, (Columbia University interns), and Charles Udomsaph (Georgetown University), with support from Erwin Tiongson (ECSPE), Rachel Sebudde (Uganda), Iaroslav Baclajanschi (ECSPE), Supo Olusi (ECSPE), and Anca Rusu (Moldova).

Do firms with higher labor productivity pay higher wages? A second ingredient of inclusive growth is that these growing and hiring productive firms pay higher wages than less productive firms. Where they do, the economy benefits, as workers are attracted to the higher wages and labor shifts to more productive employers. Figure 5 shows that for Moldova, value added productivity and wage growth is highest among firms with some form of foreign ownership. These firms are few in number, but their wage per worker seems to rise faster than all other business ownership groups, except state ownership.

Figure 4. Efficient firms in Moldova *do* invest, especially outside the cities; but they *don't* hire as they grow

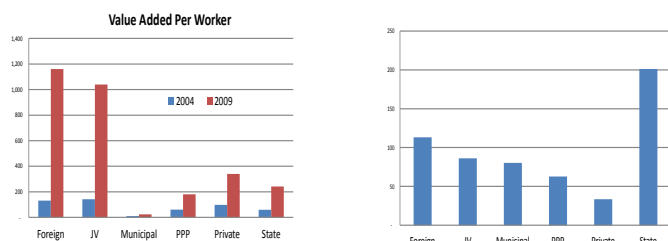


Source: Merotto and Boccardo based on Moldova Financial Statements survey.

Figure 5. Foreign firms in Moldova have higher productivity and wage growth

Productivity is highest and is growing most in foreign owned companies

Wages can rise faster in foreign firms with rising productivity

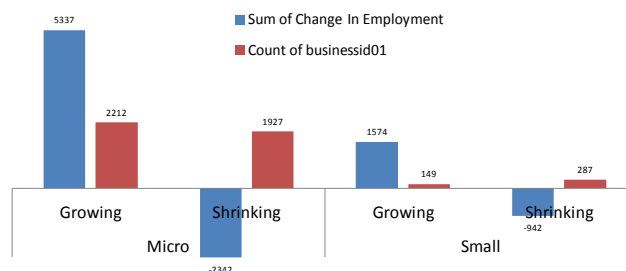


Source: Merotto and Boccardo based on Moldova Financial Statements survey.

Growth dynamics: do small firms grow and hire? In low-income countries (LICs), microenterprises and informality dominate the job market. Growth and urbanization are leading to the rapid entry of many thousands of small firms into the economy. Though business data are generally less well developed in LICs, it is possible in some countries to quickly get the facts about business dynamics using the BuDDy tool. Figure 6 shows that in Uganda, micro and small firms *do* grow over time,

but there is a lot of churning, with many firms shrinking and many firms growing and very large firms – as research by the World Bank has shown is also the case for Latin America – predominantly shrinking. Most likely these are firms restructured under outward-oriented, private sector-led reform programs.

Figure 6. In Uganda Micro and Small Enterprises Grow on Average – With a Lot of Churning
Evidence of Churning Amongst Small and Micro Firms in Uganda 2001-2010



Source: Authors' calculations, BuDDy database, and national data sources.

The Path Ahead

In the future, the BuDDy team in the Economic Policy and Debt Department (PRMED) will continue to improve this tool, working along four dimensions:

- Build BuDDy in more countries
- Develop a program of capacity building for policy makers and analysts
- Refine standard diagnostic tests based on the knowledge of what are healthy and unhealthy symptoms in business dynamics and job creation
- Develop policy-relevant “syndromes” around these symptoms, and catalogue policies that have helped business growth and jobs in these environments
- Showcase how BuDDy is being used for precise, faster, deeper, and more collaborative policy advice

To learn more about the BuDDy initiative, please contact PRMED staff, or email directly dmerotto@worldbank.org.

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