



Technological Innovation and Employment in Ghana¹

Statement of Issue

Studies on technological innovation and employment have received a considerable amount of attention by academia, policymakers and the general public. Indeed the fear of job displacement arising from technological innovation is what has actually sparked interest in technological innovation among the general public. Some economists however dispel this notion and argue that technological innovation can lead to a decline in prices, create new demand and increase profit which can be channeled into job creation. Thus, in their view, technological innovation creates rather than destroys jobs.

More recently, studies that have tried to establish a definite relationship between technological innovation and employment distinguish between process and product innovation. Product innovation refers to the introduction of a new product on the market which either replaces or adds on to an existing product. Process innovation however involves introducing a significantly improved method of production which reduces cost. From this, it can be deduced that the effect technological innovation will have on employment depends on whether process or product innovation has taken place. On one hand, there is a possible labour friendly effect on employment from product innovation as introducing a new product will necessarily require more hands if the new product is supposed to add on to the existing products. On the other hand, process innovation is likely to displace workers as new methods may be labour saving. The distinction between process and product innovation may not only be useful for evaluating the quantitative effect of innovation on employment but also its effect on the quality of employment. Quality of employment refers to the extent to which workers can access decent work (security in the workplace, social protection for families, prospects for personal development, leave options etc.) which should be highly and positively correlated with skilled jobs. Consequently, in terms of the quality of employment, process innovation is likely to be skill-biased as improved methods would require more skills. From the above, it is obvious the relationship between technological innovation and employment is far from resolved.

Foreign Direct Investment (FDI) is viewed in some quarters as a major vehicle for the transfer of technology to the host economy. This can occur in a number of different ways. First, the foreign affiliate can introduce a new product and/or process. Second, the presence of a foreign firm in a particular

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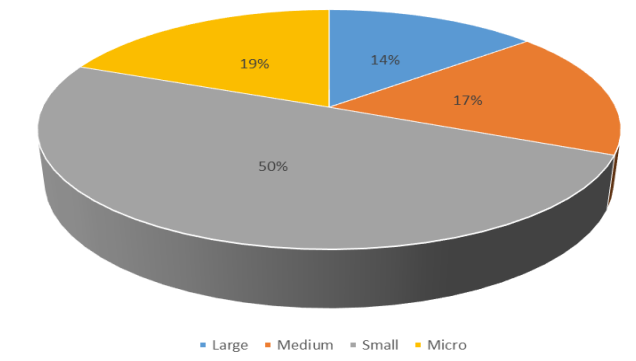
industry can generate spillover effects that will either encourage or force domestic firms to innovate if they want to remain competitive. Workers employed by foreign firms may either set up their own businesses or transfer knowledge when they are employed by other firms in the industry.

We combine these two strands of ideas expressed on the relationship between FDI and technological innovation, and, employment and technological innovation by first, investigating whether foreign owned firms are more likely than domestic firms to introduce new products and processes and, second, whether technological innovation has a positive or negative effect on the quality and quantity of employment at the firm level.

Data

We use data collected from a survey of 428 firms in six administrative regions in Ghana by a team of researchers from the Department of Economics, University of Ghana between July and September 2015.

Figure: Size Distribution of Firms



Information from the survey reveals that the innovation rate among manufacturing firms is about 49 percent. This is quite high. The difference between the share of firms that introduced new products and new processes was marginal. Whilst 41 percent of firms introduced new products, 38 percent of them introduced new processes. About 31 percent of firms introduced both new products and processes, whilst 10 percent and 7 percent of firms respectively introduced either new products or new processes. The high frequency of firms involved simultaneously in product and process innovation suggests that the two innovation types are related and should not be considered in isolation. Our sample is mainly made up of small firms (50 percent as shown in figure 1 below) with about one third being medium and large firms. About 13% of the sampled firms are foreign owned. Out of these, 8 percent of them are wholly foreign and the remaining 5% are joint ventures.



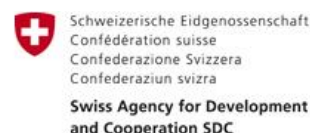


Nearly one-third of the firms sampled provide either on the job training or allow their workers to participate in training programmes organized by other organizations. As expected, we also find that more foreign firms embark on research and development compared to domestic firms.

Findings and Action Steps

In investigating the relationship between FDI and technological innovation, we find very interesting results that can aid in policy formulation. We find a positive relationship between FDI and technological innovation among manufacturing firms in Ghana. This suggests that FDI is very important in driving manufacturing firms on the path of technology. Thus, an enabling environment in the form of tax incentives and good infrastructure that allows FDI to operate smoothly will prove useful for Ghanaian manufacturing firms if indeed there are spillover effects. Although we do not find a relationship between firm size and innovation, we find that both product and process innovation correlate with research and development which is positively correlated with size. This suggests a somewhat indirect relationship between firm size and innovation. We recommend policies that will encourage the establishment of large firms and help smaller firms to grow. These policies should include more subsidies for smaller firms, training that will build the capacity of small firms and the raising of the minimum capital requirement for immigration quotas as provided by the Ghana Investment Act of 2013 to make the smaller firms which dominate our industries competitive. We also find that having an active website is important for product innovation. This suggests that policies that are geared towards promoting internet coverage and access will be important measures to facilitate knowledge sharing and consequently innovation, mainly product innovation among firms.

In examining the relationship between technological innovation and employment, whilst we find the effects of product innovation on the quantity of employment is positive and significant, we find no significant relationship between process innovation and the quantity of employment. The effects of product and process innovations on the quality of employment are insightful. Whilst we find that, product innovation increases the probability of employing highly skilled workers, we find that process innovation on the other hand increases the employment probability of low skilled workers. This suggests that firms in undertaking process innovation are not making any giant leaps. Policies that will promote product innovation should be supported by the government. Indeed the government can build the capacity of firms which will create conditions for the firms to be willing to embrace the change that might come with innovation. For instance, government can provide direct support in terms of research and development for firms that want to innovate. In addition, the government can provide tax incentives for firms that engage in innovation to encourage them to innovate. Further, with regards to policies that





will influence the effects of innovation on employment quality, some sort of technical assistance should be offered to firms to enable them make giant leaps.

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