Where Do Jobs Come From?

Lara Goldmark and Tommy Galloway
June 2015

Working Paper Series
DRAFT FOR COMMENT

USAID FROM THE AMERICAN PEOPLE
WORKFORCE CONNECTIONS
fhi360 THE SCIENCE OF IMPROVING LIVES

Table of Contents

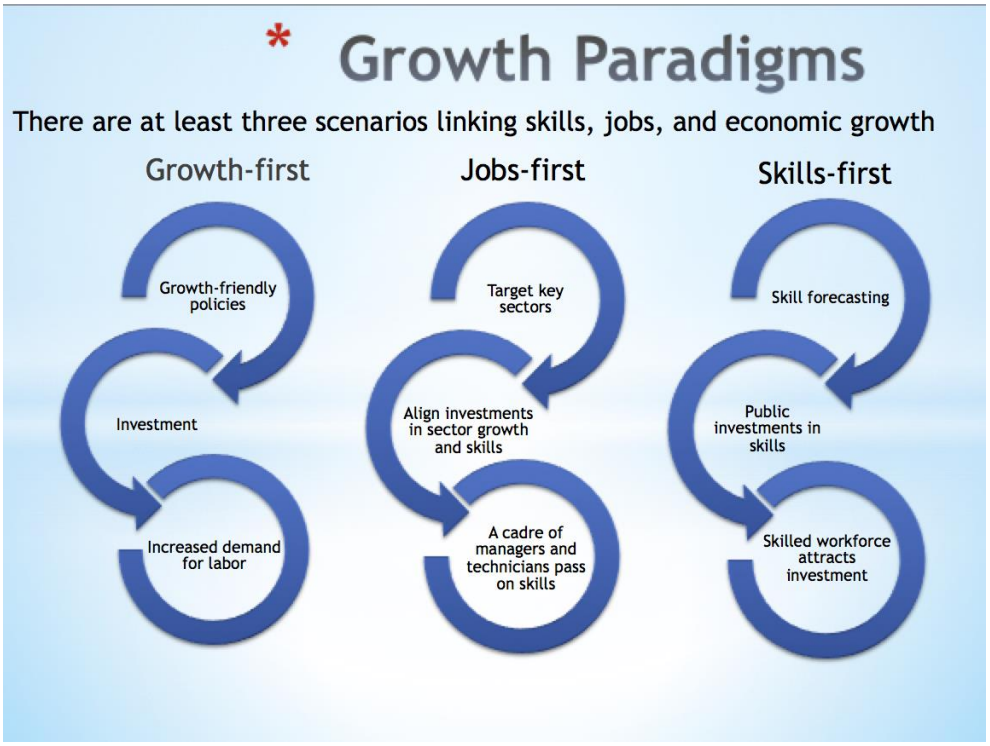
Figures

Introduction

Political leaders are always talking about creating jobs. By what chain of events, though, do these people really think they can produce jobs? We know that in most economies, the highest share of employment is found in private enterprise, not government. And, in the developing countries where we work, a significant portion of employment is found in the informal sector, or "off the books." So who really creates jobs, and how?

This paper reviews three paradigms, linked to real world "storylines," that shed light on where jobs come from (see Figure 1 below).

Figure 1. Growth Paradigms



In the first, national policymakers put a set of policies in place that lead to economic growth. This growth is associated with investment, which brings increased demand for labor. Below we review the evidence for this scenario and find that getting from the first to the second step – policies to growth – is the hardest.

In the second, national policymakers develop an economic strategy that targets key sectors. Investments in industry upgrading are aligned with investments in skills, and new jobs result. There is evidence to support this scenario, but a number of serious critiques are associated with it as well.

In the third, national policymakers predict skills needs, allocate resources to education and training, and the resulting skilled workforce attracts investment. This scenario possesses the least evidence, yet is highly compelling to policymakers.

In truth, each of the models above is a caricature. All three approaches contain elements in common, and in real life, governments may choose to implement a mix of the three. There are also other paradigms worth exploring – "innovation-first", for example, or "workers-first". The key takeaway? No matter what the approach, or who the original catalyst may be – government, donors, industry leaders, etc. – a central link in the causal chain is investment. By investment we refer to all types of non-educational investment: public-private spending on infrastructure and industry upgrading, foreign direct investment, and local business expansion. Without these types of investment, new jobs do not appear. Design of programs to promote employment should focus on the links between policy measures and investment, and between investment and jobs.

Section I. "All boats float with a rising tide"

The basic idea of the growth-first paradigm is that the "right" policies lead to growth, and growth leads to jobs. To evaluate this statement, it is useful to consider how growth occurs, and its relationship to individual incomes and employment. At the aggregate level, growth can be associated with increased average income – this is an accounting fact since output divided by population equals average income. However, the question of whether growth brings increased incomes to the majority of a country's population is less clear, even in developed countries. Conventional wisdom has long associated growth, or a "rising tide" with increased incomes and employment for all, however experience has shown that growth can lead to unequal gains.

Over time, economists have developed increasingly sophisticated models to account for the components of growth[1]. The classical school, established by Adam Smith and David Ricardo, considered growth to be a straight-line relationship between inputs (land, labor and capital) and outputs. Smith and Ricardo laid the foundations for the neoclassical school which later developed more nuanced growth models, but remained faithful to the following core assumptions: markets allocate resources efficiently, firms and individuals maximize profits and utility, and agents act based on freely available information.

In the early 1900s, John Maynard Keynes developed ideas that significantly affected the theory and practice of modern macroeconomics, advocating that governments should use fiscal and monetary interventions to smooth out the adverse effects of economic recessions and depressions. He based this on the argument that aggregate demand determined the overall level of economic activity and that inadequate aggregate demand could lead to prolonged periods of high unemployment. Keynesian economics was applied successfully during the reconstruction of Europe in post-World War II, through government-funded public works; he is aptly named the "father of fiscal stimulus."

In the 1950s, Robert Solow elaborated on classical economic growth theory by including the role of productivity (greater output per unit of input). Solow hypothesized that when the increase in output was greater than the increase in corresponding inputs this must be due to technology or innovation. He introduced a new component to the production function called total factor

productivity (TFP). From this point on, TFP would be treated as a proxy for non-measurable factors such as "innovation" or "technology". However since TFP is a residual (or leftover) variable, it is actually just an abstract characterization of how much we do *not* know about growth.

Solow's growth model was called "exogenous" as the productivity variable was outside, or not explained by, the model. Beginning in the 1980s economists from the emerging "endogenous" growth school attempted to include the missing subtleties in the production function by analyzing factors associated with labor productivity, such as education, innovation, and government funding for research and development. This work drew on the theory that skills, knowledge, abilities, experience, aptitude, and training are "human capital" that, like physical capital, accrues a stream of future benefits when developed.[2] In 1992 a paper by Gregory Mankiw and colleagues[3] affirmed that differences in countries' growth rates could be attributed to the effect that human capital has on the other factors of production. In other words, human capital accounted for a portion of the "mystery growth" identified by Solow. Many interpreted this and subsequent related work as an explanation for why poor countries remained poor – their lack of human capital meant physical capital was less productive in developing countries.

Human capital theories became extremely popular and offered something for everyone – the promise of poverty reduction through economic growth; justifications for public spending to expand access to education, and support for the creation of technical vocational education and training (TVET) systems. However, developmental success was elusive. Further analysis failed to link spending on education in developing countries with growth or employment, and over time the theory lost momentum.

All in all, it seems economists' attempts to explain growth have been rather unsatisfactory. Therefore, one might expect that their recommendations for how to achieve it would also be flawed. As seen below, that does seem to be one of the lessons that history has to teach us.

Failures of the 'Washington Consensus'

Neoclassical prescriptions gone awry

During the 1980s and 1990s, there was a movement to apply economic policies originating from the neoclassical school to developing countries. The basic principle was that the measures would help markets work more efficiently, leading to growth, which in turn would lead to employment and poverty reduction. Although it was argued that the policies would lead to employment, full employment was not viewed as the primary objective. In practice, the Consensus policies often failed to achieve the larger goal of generating growth, and in numerous cases their application harmed the economic stability and prospects of nations.[4]

Assembled by John Williamson in 1989, the raft of 10 policy tools that targeted fiscal responsibility, trade liberalization, and structural adjustment, was seen as a genuine consensus that, "…almost everyone in Washington thought were needed in Latin America as of that date."[5] The free market policies became a standard prescription for reforming economic policy around the world and were promoted through a variety of channels, most notably the Washington-based multilateral institutions or international financial institutions (IFIs). Of those cited by critics, three categories of failures stand out:

Failure #1

Removing financial and capital controls led to crisis and job losses

When the Thai government liberalized capital controls, but left the currency pegged to the US dollar, a difference in interest rates attracted speculators and caused a bubble.
When the bubble burst, investors pulled their money out and Thailand became the first domino to fall in the Asian financial crisis. The crisis in Thailand led to an IMF bail out which came with mandatory austerity policies, which in turn exacerbated job losses. Economic impacts of the crisis in Thailand included major job losses in the finance and real estate sectors, the construction sector, and manufacturing sectors with high import content affected by the currency depreciation (computer, electronics, and automotive)[6].

Failure #2

Where there was growth, it was unequal and 'jobless'

The institutions that promoted the Consensus often point to Ghana as an example of success[7]. However, economic growth was not accompanied by job creation. When the policies were first put in place, macroeconomic improvements were recorded (GDP growth as high as 6%, reduced inflation, budget surplus, and increased export earnings.) However, these effects were accompanied by uneven development: reductions in the standard of living, increase in poverty, and reduced access to basic services[8]. The World Bank had predicted that by making local industries more competitive, the policies would lead to employment.[9] Instead, import competition destroyed entire manufacturing subsectors.[10]

Failure #3

Policies tried to liberalize markets that weren't ready

For several countries in Africa, price liberalization policies were applied without considering the country context. Critical prerequisites to price liberalization in the agricultural sector were missing, i.e. a strong market for farmers' inputs and outputs, provision of credit, and infrastructure that would help facilitate the market for agricultural goods. Allowing interest rates to be set by the market led to prolonged periods of high interest rates and did not improve access to credit. In addition, the 'static' focus on a country's comparative advantage undermined its ability to evolve from that particular advantage. Worst of all, pushing countries in Africa to maintain the same comparative advantage led to increased export volumes of particular goods and a subsequent collapse in the prices of those goods.[11]

To boot, several countries that *didn't* follow the policies saw rapid growth in employment:

Counter example

China did not follow Washington Consensus policies, and gained jobs

Nations that most aggressively resisted the Washington Consensus policies fared better during the Asian financial crisis of 1997 and saw more rapid recoveries. Countries like China, Malaysia, and South Korea, in addition to turning down IMF money, enacted a series of stabilizing policies directly based on their own needs and contexts. China for example maintained capital controls, and grew at a rate of 8 percent during the time of the Asian financial crisis. The government undertook an expansionary spending approach in the form of significant infrastructure and state building projects, which injected money into the economy for the short run, while also addressing long run growth needs.[12] China also resisted the rapid restructuring of state enterprises, in large part because they employed large numbers of people. What China was able

to implement, and in a sense the largest failing of the Washington Consensus "one size fits all package" was a set of measures that carefully combined growth with microeconomic reforms - balancing the two so that they combined into a virtuous circle.[13]

What's in the government toolbox?

Employment-centered policy levers[14]

The Arab Spring that began in 2010 may have done the global economy a great service by bringing the issue of employment to the forefront of the policymaking agenda. Throughout history, as seen above, economists have tended to pursue growth first and assume that employment would come as a result. In cases where employment has been acknowledged to be the primary concern, the debate has centered around whether and to what extent the government should try to counteract the effect of business cycles by ramping up spending during recessions. Evidence does show that fiscal stimulus can help increase the level of activity in the economy, mitigating the loss of jobs, and in some cases creating employment options. In terms of how to do this, investment programs have generally been shown to be more effective than tax breaks. That said, and given the fiscal constraints many developing countries face, what else can be done?

- Governments can use direct hiring to increase employment. This has typically yielded problematic results, including overstaffing, inadequate performance incentives, and low pay. Where unnecessary jobs have been phased out, this has contributed to an emerging group of dissatisfied people.

- Governments can subsidize hiring, via tax incentives or employment subsidies. If designed to bridge temporary gaps in demand, or mitigate shocks, these policies can be effective. As a long-term solution, though, they can negatively affect competitiveness.

- Governments can print money and/or lower interest rates. In developing countries, monetary policy should be approached with care – expanding the monetary base will only lead to more investment if there is sufficient demand. Since developing countries' financial systems are often highly liquid, lowering interest rates may not produce the desired effect of increased consumption, and local firms may not have the capacity to respond to increased demand.

- Governments can use policy options related to trade and foreign direct investment (FDI) to boost employment. Long-term protectionist policies, in addition to conflicting with regional and global trade agreements, have not been shown to deliver advantages. The key is to identify temporary measures that can be used to protect domestic industries, and use them in tandem with investments and incentives to raise productivity.

- Structural policies are probably the most promising category of government options to promote employment. These types of policies range from health programs to business incubation efforts. Ernst highlights three areas worthy of particular attention:

    - Restructuring education and training to ensure the employability of workers;
    - Improving the business environment to promote flexibility for workers and employers; and

- Offering incentives for competitive technology choices by investors and firms with greater impact on employment.

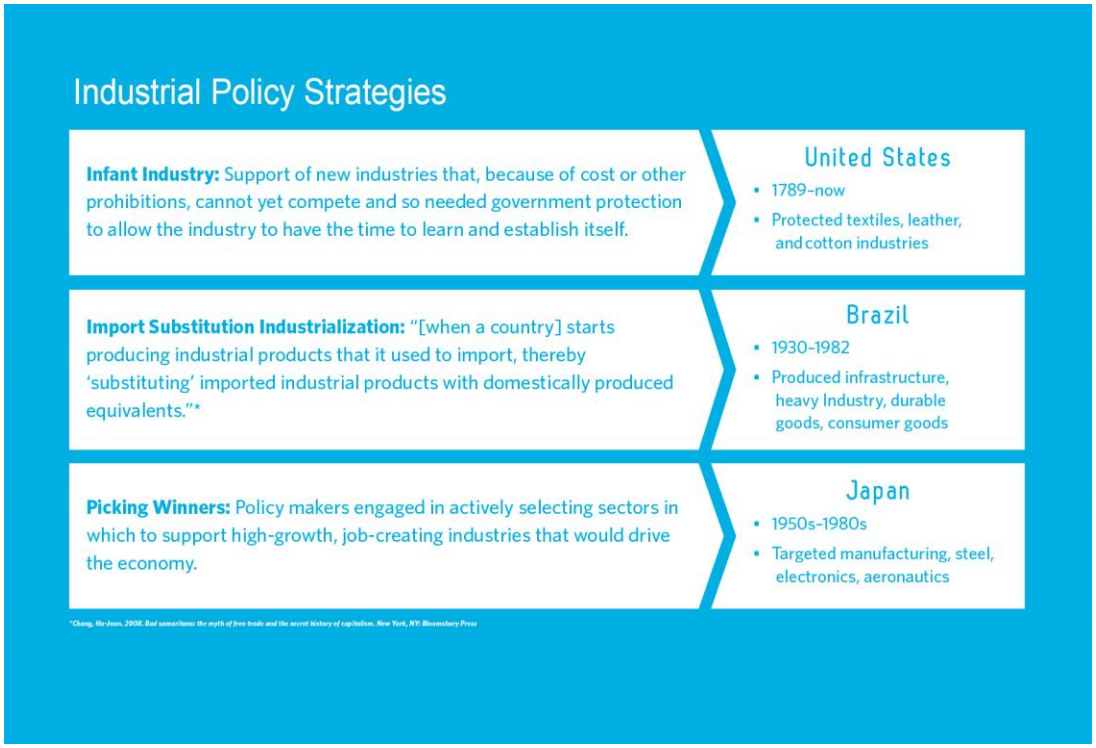
Key examples of structural policies discussed in sections 2 and 3 of this paper include industrial policies implemented in Japan and Korea, and the investment promotion strategies employed by Singapore and Ireland.

Section II. "Picking Winners"

The jobs-first storyline refers to a set of policies implemented by national governments, often with the goal of modernizing their economies. As countries develop, they tend to follow a well-known trajectory, as the base of their economy shifts from agriculture to manufacturing, and later to services (such as finance and information technology). As early as the 1700s, countries such as Britain and the United States used protective trade policies to support new industries such as textiles. Developing countries, especially in Latin America and Asia, adopted variants of this approach in order to build up their manufacturing sectors.

Many countries used industrial policy as a tool to generate political stability and social benefits. The high labor intensity of the manufacturing sector created employment for large numbers of people and the income they earned fueled the rise of consumer goods. Thus, although employment was not declared as the primary goal, it was at the center of these policies and served as a key indicator of their success. We classify this experience under the "jobs-first" paradigm because, among the approaches discussed in this paper, these policies resulted in the largest sheer number of jobs being created. Probably for that reason, these policies have persisted over time despite the critiques discussed below. Today, when policymakers design job-creation programs, they employ strategies that have their origins in the lessons learned from industrial policy. Figure 2 below defines several well-known strategies and gives examples.

Figure 2. Industrial Policy Strategies



Japan and Korea

Japan is widely considered to have successfully used industrial policies to achieve economic growth and diversification; employment, and social stability, serving as a model that other countries attempted to emulate. Having come out of World War II severely damaged, and less developed than other Western nations, Japan immediately instituted a set of protective trade measures.[15] Policymakers chose the United States as an ideal example of success, and began to pick industries the United States had succeeded in as worthy of development.

Led by the Ministry of International Trade and Industry (MITI), the selection process was rigorous, based on technical information rather than political factors, and specifically targeted manufacturing as the key to growth.[16] Targeted sectors provided significant spillovers in growth and learning to other areas of the economy. One of the clearest examples of this dynamic was that of the automobile sector, selected because of the potential for linkages with other sectors in the economy, such as steel, chemicals, tires, and machinery. These linkages served to as a pathway for the transmission and expansion of knowledge, technology, and ultimately, jobs, throughout a series of related sectors.[17]

Korea built on Japan's experience, starting with ISI in the 1960's and by the 1970's, focused on supporting targeted industries. Like Japan, Korea chose sectors based on national security as well as their potential for industrial upgrading and linkages to other sectors (iron and steel, nonferrous metals, shipbuilding, machinery, electronics, and chemicals).[18] Later, Korea also promoted information technology industries and small and medium enterprises (SMEs).[19]

While the Korean government, like Japan, did work through state-owned enterprises, it also worked closely with favored "chaebol", or large private sector family owned companies, such as Hyundai. Unlike other countries that faced challenges in weaning their industries from state support, Korea's less state-centric approach, involving more direct engagement with private sector actors, allowed the government to scale back its direct sector targeting and control.[20] Korea took a highly technical approach not only to sector selection, but to the design of support mechanisms. "Instead of handouts, subsidies became incentives for greater productiveness."[21] The government worked with the private sector to study what had to be done to move up the value chain in industries that were currently importing intermediate inputs. Korea worked to build the capacity to replace these inputs with domestically manufactured items through technology acquisition, human resource development, and construction of optimal-scale plants aimed for the global market.[22]

Critiques

Arguments against industrial policy are numerous and varied, but generally tend to zero in on the 'picking winners' aspect:

- Critics argue that the process of selecting some firms is simply unfair – industrial policy support to build up a particular industry means that resources are being taken from somewhere else. The risk being that in choosing the wrong industry to support, the state has actually undercut what could have alternatively been a competitive industry.

- A second argument critics level against industrial policy is that it can create state sponsored 'sleeping giants,' deadweight uncompetitive companies that become essentially too big to let fail, given the numbers they employ, and continue to consume state resources. This situation has been linked to industry selection based on political, rather than economic, criteria. In such a case the prospects for competitive advantage rapidly slip away as resources are sunk into an industry without increases in productivity; in many cases even leading to *decreases* in productivity.

- A third critique of industrial policy points to instances where nations choose targets for growth far beyond their capacity. Nations low in capital endowments and productive capacity run into problems when attempting to develop industries based on examples from advanced nations.[23] The result: capital-intensive industries that are unable to compete and survive in global markets without continued resource injections.

- The fourth can be best summarized in stating that selected 'winners' would have won with or without support. In Japan, for example, "transistors, television sets, motorcycles and videotape recorders, [are] all sectors in which Japan has been, or is, a world leader, yet…not singled out by MITI for priority treatment. If these were the outcomes of a virtually spontaneous growth process, could it not be argued that steel, cars or integrated circuits succeeded for similar spontaneous reasons?"[24] This particular argument has a rather credible response; there are several aspects of Japan's efforts that can explain broad-based growth. First, despite MITI offering specific support to some sectors, other industries were not necessarily neglected, and Japan's protectionist policies supported all industries in the country. Second, there were resource and knowledge spillovers to non-priority sectors. Studies have shown sectors that grew unexpectedly to be linked to basic industries that were targeted[25].

It seems that most of the arguments are about whether or not industrial policy is implemented correctly – highlighting the unfortunate effects when it is not. Certainly, in many countries failed attempts to implement industrial policy resulted in unhealthy dependence on subsidies. The approach went out of fashion for a few decades but in recent years has made a comeback. Dani Rodrik in *Industrial Policy for the Twenty-First Century* (2004) provides a manifesto for industrial policy "done right" – providing a framework aimed to maximize its potential to contribute to economic growth while minimizing the risks that it will generate waste and rent-seeking.

Government intervention today tends to be less-hands on than the early policies practiced by Japan, and rather a means to take on risk that the market normally would avoid. Instead of picking winning sectors, governments work across sectors and attempt to identify 'winning research projects' that will lead to business innovation.[26] There is however, an explicit recognition that some technologies and industries are more important than others in driving economic growth. [27]

Even in the United States where the public discourse would lead one to believe that economic policy is designed to establish a "level playing field", government support of companies and industries have generated spectacular successes. Innovations that benefitted from government-funded research in the United States include "the cotton gin, the manufacturing assembly line, the microwave, the calculator, the transistor and semiconductor, the relational database, the laser beam, the graphical user interface, and the global positioning system (GPS), and the search algorithm used by Google.[28]

Development tools based on the "jobs –first" approach

A number of development tools and approaches build on lessons learned from industrial policy. In the 1990's Harvard business professor Michael Porter introduced the concept of "competitiveness", based on his research identifying success factors for leading industries of developed countries. He looked at sophisticated industries involving complex technology and highly skilled human resources, such as chemicals in Germany, specialty steel in Sweden, pharmaceuticals and chocolate in Switzerland[29], etc. He defined "competitiveness" as "sustained increases in productivity" and his case studies were industries that had dominated the world market for long periods, up to a century in some cases. Porter noted that leading national competitors could often be found in the same city or region. Intentionally or not, he argued, these "clusters" generated knowledge spillovers and accelerated industry upgrading. Porter's research, similar in its findings to a series of studies on the fashion industry in Northern Italy, inspired a series of "cluster-based" growth promotion efforts financed by governments and donors. These initiatives invariably contained a significant dialogue component, aimed at maximizing public-private collaboration to drive investments that would lead to continued productivity enhancements or "competitiveness." Porter maintained that this process was not inconsistent with maintaining full employment.

Another framework that has inspired decades of development programming is the value chain. Originally documented in the marketing literature of the agricultural economics profession, this analytical technique was introduced to development in the late 1980s by a group of Michigan State University researchers[30]. A value chain map traces the flow of a product from its inception

(i.e., planting) through each stage of transformation (i.e., processing, packaging, storage, transportation) through its sale to the final customer, and has become a standard tool for assessment and project design. Practitioners analyze the relationship between firms in the value chain, looking for "leverage points" where interventions can yield benefits to large numbers of small firm owners or low-income workers. For example, policy constraints that, if changed, would provide benefits to small enterprises, or targeted support to help small suppliers "upgrade" from a low-value channel to one that offers higher prices.

Based on these frameworks, today governments and donors offer support to projects that aim to achieve competitiveness by:

- Selecting growth sectors or clusters that hold the potential to generate jobs
- Facilitating dialogue among public and private actors with the goal of generating collaborative action and investment
- Developing a policy reform agenda
- Providing access to finance and markets
- Investing in training

Perhaps the most strongly endorsed lesson, and one that has been disseminated widely among practitioners when intervening in private sector systems like clusters or value chains, is the need for a "light touch." Lessons from the past show that subsidies or incentives work best when they are designed to encourage productivity improvements and catalyze an industry learning process. Sometimes projects under pressure to deliver quick results ignore these lessons, and in these cases upgrading efforts become dependent on subsidies and cease once support is withdrawn. Sound familiar?

Section III. "Build it and they will come"

The skills-first storyline focuses on the role that education and training can play in creating jobs. The most credible interpretation of this storyline asserts that skills needs can be predicted, that skills play a significant role in attracting investment, and that this investment creates jobs. Of the three storylines, this is the one with the least empirical evidence. Yet in practice, it holds great appeal for policymakers.

From classical to industrial education

The classical tradition of education goes back to the Greek philosophers, focusing on literature, language proficiency, and other 'arts.' However, as societies began to change in the face of industrial labor and increased urbanization, two things happened. First, countries like Britain organized massive enrollment in basic education. Families changed their childbearing patterns from the agricultural norm of having as many offspring as possible to one where parents had fewer children and invested more in each child's education.[31] Second, national governments became aware of the importance of "industrial education" and the effect this could have on their economies[32].

During the 1900s, United States educator John Dewey led a movement to remake education in a democratic society: learning should be tailored to individual needs as opposed to characterized by rote memorization.[33] Schools aspired to empower students to understand their career in the

context of a larger social system, and households to engage in society. While Dewey influenced methods and principles, historical events influenced content. By the 1950's as industries evolved in complexity, the manufacturing sector's demand for productive and skilled workers became apparent. During the Cold War, the Soviet Union's unexpected launch of its Sputnik satellite was a dramatic catalyst that spurred United States policymakers to place emphasis on technical skill building in mathematics, science and technology.

It was around this time that the human capital approach ushered in the "golden age" of education funding. As mentioned in Section I, human capital theory appealed to a range of stakeholders, who each saw a potential positive effect. Educational theorists for example believed investments in human capital (aka, education) could lead to empowerment and equalization of opportunities, and rise in incomes. Meanwhile, economists saw human capital as a means to drive economic growth. In the 1960s and 70s, organizations including the Organization for Economic Cooperation and Development (OECD), United Nations Educational Scientific and Cultural Organization (UNESCO), United States Agency for International Development (USAID), the Ford and Rockefeller foundations, and the World Bank made investment in human capital their rallying cry.[34]

However, support began to wane as evidence that evaluated the impact of public education programs came back showing small or even negative returns to the explosion in school resources in developing countries.[35] At the same time, international donors promoted technical vocational, education, and training (TVET) as an alternative to school-based education, one that would lead to employment and jobs. Under institutions like the World Bank, from 1963 on to the late 70's, projects intentionally focused on TVET with the belief that they could better develop skills needed for job acquisition.[36]

In 1990 and 1991 the debate between education and TVET was altered by a series of papers written by the World Bank that took a direct stand in support of primary education as the key to developing a flexible workforce. These papers argued for the importance of education as a means to achieving sweeping development in poorer nations: "Primary education has direct and positive effects on earnings, farm productivity, and human fertility, as well as intergenerational effects on child, health, nutrition, and education."[37] Crucially too education would provide, "the ability to learn new skills throughout a career." [38]

Yet critics began to push back, citing the growing evidence that such programs were not demonstrating impacts related to income, employment, or poverty reduction. The reason given was that despite increases in enrollment, the quality of education in developing countries was still poor.[39] Subsequent research and debate focused on how to achieve quality, which type or level of education was more worthy of investment, as well as questions related to access and inclusion. It seems the claims that education was the magic bullet had been discredited. Further studies continued to link education and training broadly to economic growth, but without rigorous causality and without a link to investment or jobs.

The link between skills and investment

Perhaps the biggest omission in the human capital discussion was an exploration of the role of education and skills in catalyzing investment, a major conduit by which jobs are created. In the case of foreign direct investment, depending on the sector, local skills profiles and workforce

flexibility weighs heavily in decision making about where to locate. Skills are never the only factor and rarely the first criterion; real-life experiences show that market considerations and financial incentives come first[40]. However, investors agree that existing skill levels and the ability of the workforce to adapt and learn provide a sort of "insurance" effect – that is, once the investment is made the skills and learning factor is a highly important success factor in project implementation. A few countries have been successful in integrating their efforts to attract foreign direct investment (FDI) with targeted improvements to their education system. Below are two examples, Singapore and Ireland.

Singapore

Singapore's skills-first strategy was developed beginning in the 1960s soon after it became independent from British rule. The strategy was a reaction to social and labor unrest and high unemployment at the time. "Singapore's leadership noted that they had nothing but people on a small island with few other natural resources…[they] decided to develop a vision [using Switzerland as a benchmark].[41]"

Singapore undertook a massive campaign to increase its education and skills levels, investing in new facilities and placing emphasis on math, science, technical education, and the introduction of English.[42] The country used skill building and education, in combination with private sector partners' tailoring of trainings, to generate investment and export-oriented growth. Over the next two decades, Singapore's economy underwent a dramatic economic transformation to a higher value economy.

With government support through the Economic Development Board (EDB), companies like Tata, Rollie and Philips created training centers in Singapore. EDB organized campaigns to directly appeal to companies to invest in Singapore, creating training centers that would allow the targeted companies to hire specialized staff. If investments did not come through, the institutes produced workers who had benefited from training and skill building in a more general way that appealed to other companies. By shifting more of the training and skill building to the private sector, Singapore was able to enter a virtuous cycle where foreign investment would become even more technologically intensive, and thus able to absorb the higher cost Singapore labor.[43]

Over time, the single partner public-private skills initiatives evolved into broader industry training centers, as the emerging needs of knowledge- and technology-intensive industries would require resources in excess of what a single partner could provide.[44] Singapore's continued success has been linked not just to placing skilled workers in the workforce, but in keeping them there despite economic shifts, through retraining and other measures (such as flexible arrangements for elderly workers and "lifelong learning" programs for low wage workers) to ensure a flexible and adaptable workforce.

Ireland

Considered one of the poorest European nations at the time, Ireland began to reform its economic and educational systems in the 1950s. The government launched a series of efforts to bring together educational and training systems, and began to recognize the value of FDI in creating new job opportunities. In 1965 government reforms to the national education system

included the introduction of a transition year to promote work-based skill development and an awareness of career choices.[45] Via the Industrial Training Act of 1967, the government compelled employers to clarify their workforce demands, through a systematic analysis of training needs and management support for the training process. Then, under the Irish Development Act in 1969, the government granted independence to the Industrial Development Agency (IDA), which was tasked with attracting FDI. In addition, IDA was provided a mandate to focus its activities on "the development of higher-skilled and higher-quality workplaces."[46]

In the 1980's the country faced a recession, with a large number of Ireland's youth moving abroad to find work, and unemployment at home reaching 20%.[47] The IDA worked to align various stakeholders in the economy, such as government agencies, industry, academia and regulatory authorities, resulting in collaboration to set a vision for and drive economic growth for the country. This practical government approach allowed, "Stakeholders [to] work together as a national team to win investment in Ireland."[48] Policy measures, in addition to the skill-based ones described above, included progressive tax breaks and grants to provide incentives for investment, and a well-known strategy termed "after-care" to follow up with investors once they had located their plants or offices in the country, to see whether they were satisfied or if not, what could be done to improve their experience.

The result has been a dramatic improvement in the educational capacity, and its ability to fill the needs of jobs created by new companies created through coordinated FDI. From the late 1990s until the global financial crisis in 2008, Ireland was able to attract return migration, in the form of skilled IT and other professionals. Some claim that Ireland's comparative quick recovery, and its avoidance of a deeper recession is due in part to the flexibility of its workforce[49]. This can be seen in the success with which the country has increased labor productivity following the crisis, and shifted its focus towards exports.

Skill needs are changing

Just as classical education evolved towards an industrial model in the 18th and 19th centuries, it may again be time to adapt our education and training systems to modern trends. In the globalized economy, skills needs are evolving so fast that a stand-alone education system may be incapable of addressing them.

The manpower planning techniques of the 1960s and 70s assumed workers were cogs in a machine and work was repetitive. With the quality movement in the 1980s, workers became more autonomous and participated in factory-wide processes. Today, we see robots replacing workers for repetitive functions, and an increasing demand for individuals with the technical and soft skills to perform "interactive work," the fastest growing category of employment in developed countries.[50]

Studies have shown that for most professions, the majority of learning occurs on the job, rather than in the classroom. Highly technical fields like medicine have adapted their educational systems to include extensive practical training periods before an individual can be licensed. Along the same lines, recent research has shown that 70 percent of what non-management employees learn at work they learn informally, by participating in ordinary workplace activities which allow them to acquire competencies critical to effective performance. [51]

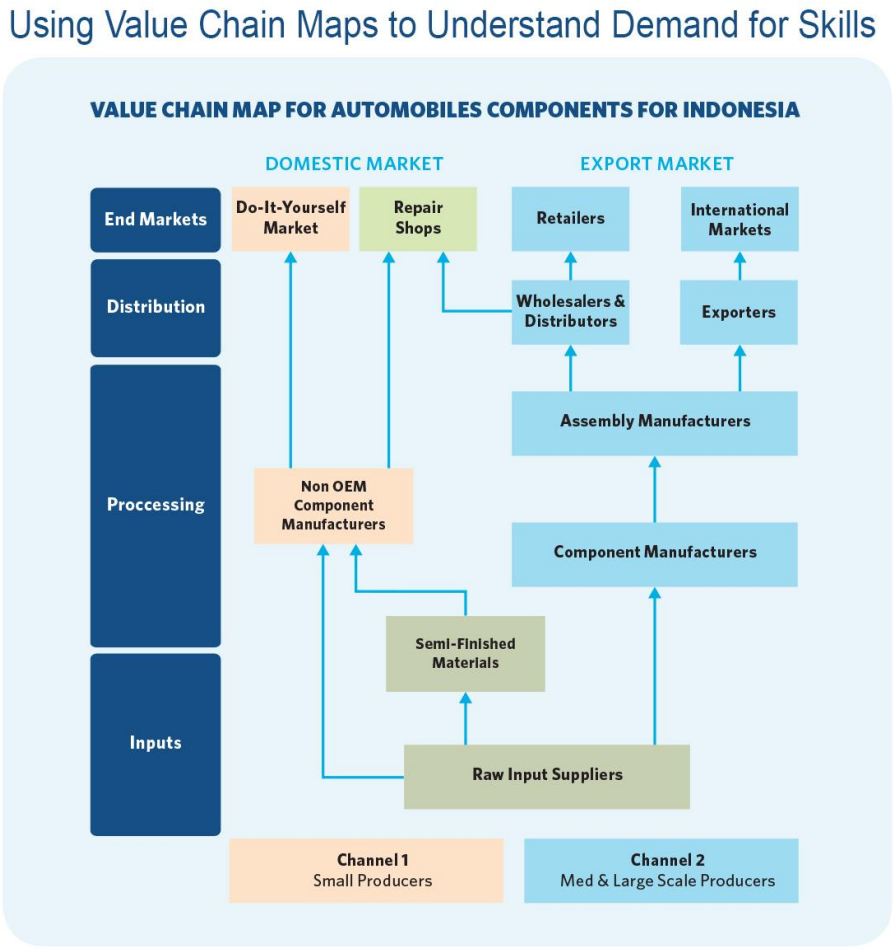
Looking forward, it is likely that the concept of what a "job" is will continue to evolve towards flexible, project-based work, with jobs for life being the exception rather than the norm. Likewise, it may make sense to intentionally blur the boundaries between education and work, creating opportunities for youth to gain on-the-job experience early and often. Looking back, we see the trajectory of classical education, to industrial education focused on repetition, to an emphasis on critical thinking. Looking forward as technologies continue to transform the possibilities in business, skills for the future are likely to include ideation, large frame pattern recognition, and complex communication. [52]

Development tools for a "skills-first" approach

Educators have developed and refined a deep and broad range of tools for skills development and processes for the strengthening of educational institutions, and continued advances in this area are needed. However, based on the lessons learned from history about the link between investment in business and job creation, we argue that there is an urgent need today for tools that help *align investments in business with investments in skills*. For example, the following two types of tools that can contribute directly to alignment: (1) those that help actors in a labor market work together more effectively, so that they can implement plans that coordinate investments in business with investments in skills, and (2) those that help educational institutions understand the demand for skills. There are a number of existing tools that fall into the first category; for example some of the cluster facilitation techniques that came out of the competitiveness movement are relevant. There are also systems approaches to stakeholder management that can be adapted to help labor market actors communicate and collaborate better with each other (employers, educational institutions, public sector representatives, and members of the workforce). A review of these tools will be covered in a forthcoming Workforce Connections working paper. Below is a brief description of an example of the second type of tool; a simple process that can be used by national or local institutions to better understand, and even predict, demand for skills in their economy. A more detailed explanation of this tool is available through the Workforce Connections website (http://www.wfconnections.org).

Workforce development and employment policies in developing countries must grapple with the fact that the majority of these countries' enterprises operate informally. This means labor is not regulated; reliable data is unavailable; and most importantly no one is sure whether these jobs are worth investing in. For this reason the value chain framework, originally developed based on agricultural economies, is a useful complement to more data-driven types of analysis.

Figure 3. Understanding Demand for Skills



It is relatively easy to identify growth sectors in the formal economy, by analyzing quantitative data available through proprietary databases such as the Global Trade Atlas, and open source platforms like the Product Space, hosted by Harvard and the Massachusetts Institute of Technology. For example in this case, above, data analysis for Indonesia showed the manufacture of automobile components to be a high-potential growth sector. By complementing these resources with a value chain map that shows formal and informal channels for goods, development practitioners can identify whether the informal sector is likely to grow cyclically (along with the formal channels) or counter-cyclically (serving as a safety net for workers who have lost their jobs). By identifying business constraints and opportunities in the chain, it becomes possible to use the value chain as a proxy for skills demand. Through qualitative interviews, it is possible to list current jobs, their functions, and the associated skill needs. By identifying upcoming investments in the value chain, one can map the *future* demand for skills as well.

ENDNOTES

[1] The description of the evolution in economists' thinking that follows draws heavily from an unpublished paper prepared for DAI by Andre Averbug in 2011. Andrew Averbug, "Development Economics in Theory and Practice: A Literature Review," (unpublished paper, Development Alternatives, Inc., 2011).

[2] J. Norman Baldwin, Stephen A. Borrelli, and Michael J. New, "State Educational Investments and Economic Growth in the United States: A Path Analysis," *Social Science Quarterly* 92, no. 1 (2011): 226-245.

[3] Gregory N. Mankiw, David Romer, David N. Weil, "A Contribution to the Empirics of Economic Growth," *The Quarterly Journal of Economics* 107, no. 2 (1992): 407-437.

[4] As John Williamson admitted, "the results have been disappointing, to say the least, particularly in terms of growth, employment, and poverty reduction." John Williamson,. 2002. "Did the Washington consensus fail?" (lecture in the series "Practitioners of Development" at World Bank, Washington, DC, January 13, 2004).

[5] John Williamson, "From reform agenda to damaged brand name," *Finance and Development* 40, no. 3. (2003): 10.

[6] Laurids S. Lauridsen, "The Financial Crisis in Thailand: Causes, Conducts and Consequences?" *World Development* 26, no. 8, (1998): 1575-1591.

[7] Though initiated prior to the coining of the term 'Washington Consensus' the structural re-adjustment policies that the IMF launched in Ghana in 1983 were the exact levers Williams put forward as having a global consensus amongst Washington institutions and partners.

[8] Kwadwo Konadu-Agyemang, "The Best of Times and the Worst of Times: Structural Adjustment Programs and Uneven Development in Africa: The Case of Ghana," *The Professional Geographer* 52, no. 3, (2000): 476.

[9] Kwadwo Konadu-Agyemang, "The Best of Times and the Worst of Times: Structural Adjustment Programs and Uneven Development in Africa: The Case of Ghana," *The Professional Geographer* 52, no. 3, (2000): 470.

[10] Martin Khor, "The World Trading System and Development Concerns," in *The Washington Consensus Reconsidered*, edited by Narcis Serra and Joseph E. Stiglitz, 245. Oxford: Oxford University Press, 2008.

[11] Joseph E. Stiglitz, "Is there a Post-Washington Consensus Consensus?" in *The Washington Consensus Reconsidered*, edited by Narcis Serra and Joseph E. Stiglitz, 44. Oxford: Oxford University Press, 2008.

[12] Joseph Stiglitz, *Globalization and Its Discontents* (New York: W.W. Norton & Company, 2002) 125.

[13] Joseph Stiglitz, *Globalization and Its Discontents* (New York: W.W. Norton & Company, 2002) 126.

[14] This section is based on "The Looming Jobs Challenge," an article by Ulrich Ernst in DAI's journal *The Jobs Challenge: Fresh Perspectives on the Global Employment Crisis* 15, no. 1, (2012): 11-17.

[15] Eduardo Silva, "The Import-Substitution Model: Chile in Comparative Perspective," *Latin American Perspectives* 34, no. 3, (2007): 80.

[16] Andrea Boltho, "Was Japan's industrial policy successful?" *Cambridge Journal of Economics* 9, (1985): 195.

[17] Saadia M. Pekkanen, "Picking Winners?: From Technology Catch-up to the Space Race in Japan," (Stanford: Stanford University Press, 2003), 138.

[18] Lim Wonhyuk, "Chaebol and Industrial Policy in Korea," *Asian Economic Policy Review* 7, (2012): 77.

[19] Lim Wonhyuk, "Chaebol and Industrial Policy in Korea," *Asian Economic Policy Review* 7, (2012): 74.

[20] Lim Wonhyuk, "Chaebol and Industrial Policy in Korea," *Asian Economic Policy Review* 7, (2012): 74.

[21] Alice Amsden, "The Wild Ones: Industrial Policies in the Developing World," in *The Washington Consensus Reconsidered*, edited by Narcis Serra and Joseph E. Stiglitz, 117. Oxford: Oxford University Press, 2008.

[22] Lim Wonhyuk, "Chaebol and Industrial Policy in Korea," *Asian Economic Policy Review* 7, (2012): 73-4.

[23] Justin Yifu Lin and Célestin Monga, "Growth Identification and Facilitation: The Role of the State in the Dynamics of Structural Change," *Policy Research Working Paper* 5313, (2011): 15-6.

[24] Andrea Boltho, "Was Japan's industrial policy successful?" *Cambridge Journal of Economics* 9, (1985): 195.

[25] Andrea Boltho, "Was Japan's industrial policy successful?" *Cambridge Journal of Economics* 9, (1985): 195.

[26] Joseph E. Stiglitz, "Public Policy for a Knowledge Economy," *Center for the Study of Culture and Society* (1999): 22, accessed April 22, 2015 http://www.cscs.res.in/dataarchive/textfiles/textfile.2010-09-28.3618136774

[27] Stephen Ezell, "The Economist's Strange Attack on Industrial Policy," *The Progressive Fix - Progressive Policy Institute* (blog), August 25, 2010, http://www.progressivepolicy.org/issues/economy/the-economist%E2%80%99s-strange-attack-on-industrial-policy/

[28] Stephen Ezell, "The Economist's Strange Attack on Industrial Policy," *The Progressive Fix - Progressive Policy Institute* (blog), August 25, 2010, http://www.progressivepolicy.org/issues/economy/the-economist%E2%80%99s-strange-attack-on-industrial-policy/

[29] Michael Porter, *The Competitive Advantage of Nations* (New York: The Free Press, 1998), 310-330.

[30] James J. Boomgard, Stephen P. Davies, Steve Haggblade and Donald C. Mead, "Subsector Analysis: Its Nature, Conduct and Potential Contribution to Small Enterprise Development," *MSU International Development Papers – Working* Paper, no. 26 (1986): 1-2.

[31] Gregory Clark, "The Condition of the Working Class in England, 1209–2004," *Journal of Political Economy* 113, no. 6 (2005): 1314, accessed May 8, 2015 http://www.jstor.org/stable/10.1086/498123.

[32] See John Michaels, *Science* 24, no. 601 (1906): 109. for Sir Lyon Playfair's public criticism of Britain's flagging industrial capacity, noting that ribbon production has been lost to Switzerland due to that country's investment in higher-skilled workers.

[33] Richard Plate, "The Evolution of Curriculum Development in the Context of Increasing Social and Environmental Complexity," *Creative* Education 3, no. 8 (2012): 1313.

[34] Irving Sobel, "The Human Capital Revolution in Economic Development: Its Current History and Status," *Comparative Education* Review 22, no. 2 (1978): 283, accessed March 3, 2015, http://www.jstor.org/stable/1187676.

[35] Irving Sobel, "The Human Capital Revolution in Economic Development: Its Current History and Status," *Comparative Education* Review 22, no. 2 (1978): 293, accessed March 3, 2015, http://www.jstor.org/stable/1187676.

[36] Kenneth King and Robert Palmer, "Planning for technical and vocational skills development: fundamentals of educational planning," *UNESCO: International Institute for Educational Planning* 94, (2010): 28.

[37] Marlaine E. Lockheed and others, " Primary Education: A World Bank Policy Paper." *World Bank, Washington D.C.,* (1990): 15.

[38] John Middleton and others, "Vocational and Technical Education and Training. A World Bank Policy Paper," *International Bank for Reconstruction and Development,* (1991): 30.

[39] Emiliana Vegas and Jenny Petrow, "Raising Student Learning in Latin America: The Challenge for the 21st Century," *The International Bank for Reconstruction and Development*, (2008): xxii.

[40] See, for example, the case of Intel investing in Sichuan, Mariko Eva Silver, "Transnational Corporations, Institutional Change, and Economic Development: An Institutional Learning Model for Development," (dissertation, University of California, 2012), 49.

[41] Monika Aring, and Eleanor Sohnen, "Autonomy or Collaboration? An examination of the roles of Labor Ministries in Singapore, Ireland and Malaysia with those in the Dominican Republic, Paraguay and Uruguay," (unpublished paper, Inter-American Development Bank, 2014) 8.

[42] Sarosh Kuruvilla and Rodney Chua, "How Do Nations Increase Workforce Skills? Factors Influencing the Success of the Singapore Skills Development System," *Global Business Review* 1, no. 1 (2000): 19

[43] Sarosh Kuruvilla and Rodney Chua, "How Do Nations Increase Workforce Skills? Factors Influencing the Success of the Singapore Skills Development System," *Global Business Review* 1, no. 1 (2000): 25-30.

[44] Sarosh Kuruvilla and Rodney Chua, "How Do Nations Increase Workforce Skills? Factors Influencing the Success of the Singapore Skills Development System," *Global Business Review* 1, no. 1 (2000): 24.

[45] Noreen Heraty, Michael J. Morley, and Alma McCarthy, "Vocational education and training in the republic of Ireland: institutional reform and policy developments since the 1960s," *Journal of Vocational Education and Training* 52, no. 2 (2006): 180, accessed May 11, 2015, http://www.tandfonline.com/doi/pdf/10.1080/13636820000200114.

[46] Tuomo Alasoini, Elise Ramstad, Tiina Hanhike, and Nuppu Rouhiainen, "Learning across Boundaries Workplace Development Strategies of Singapore, Flanders and Ireland in Comparison," *Work-in-Net Project*, (2008): 49.

[47] Patrick Gunnigly, Noreen Heraty, Michael Morley, "Doing business in the Republic of Ireland," *Thunderbird International Business Review* 44, no. 5 (2002): 654, accessed May 15, 2015, http://onlinelibrary.wiley.com/doi/10.1002/tie.10034/abstract.

[48] "Competitiveness: IDA Ireland," *idaireland.in*, accessed May 20, 2015, http://www.idaireland.in/invest-in-ireland/competitiveness/

[49] Karl Whelan, "Ireland's Economic Crisis The Good, the Bad and the Ugly", *University College Dublin*, (2013): 21, accessed June 1, 2015, http://www.karlwhelan.com/Papers/Whelan-IrelandPaper-June2013.pdf

[50] Monika Aring and Lara Goldmark, "FIELD Report No. 17: Skills for Jobs for Growth-Effective Human Capital Development in a Changing World of Work," *FHI 360*, no. 17 (3): 1-20.

[51] Monika Aring, "Introduction to the Teaching Firm Project," (unpublished introduction, Convergent Learning Systems, 2012), 1-3.

[52] Andrew McAfee and Erik Brynjolfsson, *The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies* (New York: W.W. Norton & Company Inc.), 1-295.