Chapter 6. Education, Training, and The Low Skill Trap

I. Introduction[1]

The previous chapter analyzed some of the complementarities -- such as those with the large informal sectors and short tenure -- that discouraged investment in skills. This chapter elaborates on these complementarities and adds in some others to analyze the dynamics of a low skill equilibrium. A sustained examination of skills is crucial theoretically to establish the links and complementarities between the firm strategies analyzed in chapters 3 and 4 and labor market dynamics. Close analysis of skills is also indispensable in practical and policy terms as skills and human capital set the parameters for possible development strategies as well as the longer term potential for more equitable development.

For some years it has been a matter of settled consensus that investment in education and human capital is essential for economic development.[2] However, on the issue of how to increase human capital, research and policy recommendations focus almost exclusively on the supply side. It is of course important to increase funding, improve instruction, modernize curricula, and revitalize schools and educational administration, but these efforts are not likely to meet with high student demand for education if good jobs that require their skills are not waiting at the other end. As a report from the Interamerican Development Bank put it, "policies aimed only at improving the supply of educational services will likely fail to improve young individuals' school attainment" (Duryea, Edwards, and Ureta 2003, 18). Alice Amsden (2010) goes further and deems the overemphasis on investing in human capital a mistaken application of Say's Law

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[1] This chapter draws heavily on joint work with David Soskice (Schneider and Soskice 2011).

[2] For recent views and reviews, see Hanushek and Kimko 2000; Perry, López, et al. 2005; de Ferranti, Perry, et al. 2003. For a dissenting view, see Easterly (2001a).

(that supply creates its own demand) and a sort of "job dementia" in its neglect of complementary policies to create jobs for newly educated entrants into the labor market.

The focus on the demand side helps illuminate a number of puzzles in Latin America. Why, for example, if business in Latin America is now exposed to international competition from firms with more educated work forces, are business people not clamoring for better education and training? Why do researchers find that in Latin America "large increases in expenditure in public education in the last decades were not matched by a corresponding increase in coverage or quality" (de Ferranti, Perry, et al. 2003, 9) or, put differently, "severe inefficiencies in the process of investment in human capital" (Rodríguez 2006, 106)? Why, if returns to education are high, are individuals and families not investing more in education? And, why, if education is a perennial priority in political debate, have reform efforts not been more effective? In Brazil, for example, "there is an interesting paradox. Politicians, intellectuals, and journalists with different ideological views never tire of saying that educational policy is a maximum priority. However, the area does not advance with the required speed. Furthermore, the coalitions linked to the educational issue are politically weaker than those in other areas..." (Abrucio 2007, 52 my translation).

As examined in Chapter 5, education levels are comparatively low and, save some few sectors and brief periods, Latin America has historically suffered from a common low skill equilibrium.[3] The core theoretical idea is that labor markets have two equilibria, one at low skill levels and one at high skill levels. At the low equilibrium, individuals do not invest in skills because firms offer few skilled jobs. Firms in turn do not invest in production requiring skilled workers because they do not think they can find them in the labor market. Moreover, information and search costs are high in labor markets and further impede spontaneous, gradual movement to a higher skill equilibrium. To get out of a low skill equilibrium either lots of

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[3] For earlier work on low skill equilibria, see Booth and Snower 1996; Acemoglu 1996; Acemoglu 1997. Snower (1994) provides a more elaborated model. See also Schneider and Soskice 2011; Rodrik 2007, 101.

vacancies for high skilled jobs have to open up to convince workers to invest in skills, or lots of skilled workers have to be available in order to attract high skill businesses. In the absence of such big shifts, skill levels tend to the lower equilibrium.

Skills and skilled labor are often broad and ill defined concepts. Among skilled workers it is important to distinguish between *technicians* (workers with secondary education and substantial subsequent specialized training) and *university trained* workers (those with at least some years of university study) and between specific skills which are hard to transfer out of particular firms or sectors and general skills that are portable from firm to firm. Bringing technicians in gets beyond limitations of most recent studies that define high skill exclusively in terms of university training (see IDB 2003). This is too narrow a definition of skilled labor since it will apply to less than a fifth of the workforce in Latin America for the foreseeable future. Skilled technicians are likely to be a larger segment of the labor force and an important target of policies designed to promote equality and social mobility.[4] For training technicians with specific skills, the demand and coordination problems of a low skill trap are critical.

A lot of the recent headline news on education has been good: returns to education are high, more students are in school and university than ever before, and increasing education is helping to raise incomes and reduce inequality (López-Calva and Lustig 2010). Yet, it would be precipitous to declare the skill challenge on its way to resolution. Other indicators show chronic problems persist, especially in the quality of education (see Table 5.1 on Pisa scores) and overall economic productivity. Moreover, returns to education are falling (World Bank 2011). A number of possibles factors may be behind this trend, but at a minimum it recommends a closer examination of demand for skills and labor market dynamics overall.

Comparisons with countries that have reached higher skill equilibria may help illustrate the breadth of the gap and the grounds for skepticism that market incentives alone will be able to bridge it in the not too distant future. Table 6.1 offers some contrasts between Latin America

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[4] In Germany, for example, technicians accounted for around two thirds of the workforce in manufacturing in 1987 (Oulton 1996, 204, 208).

and some reference countries that have been held up as potential models of successful development in the late 20th century (Gereffi and Wyman 1990; de Ferranti, Perry, et al. 2002; Foxley 2009). The table reveals the large gap between Latin America and these reference countries but also provides some indicators showing that these reference countries achieved a much higher skill equilibrium with high supply and demand for skilled workers. These reference countries are rarely portrayed as simple market successes, especially in education and technology where the state and public policy were crucial protagonists.

Table 6.1. Education, R&D, and Scientists in Latin America and Selected Reference Countries

Section II examines the comparatively weak business demand, especially by leading business groups and MNCs, for higher skilled workers, both technicians and university graduates. Section III looks at the other side of the labor market at factors that reduced incentives for individuals to invest more in education. Section IV turns to politics and the obstacles to building coalitions to promote better public investment in education. The analysis is intended to be generally applicable to most of Latin America. The empirical examples though draw heavily on Brazil and Chile in part because of their recent growth and success and in part because skill scarcity has become a more serious constraint on growth in these countries than in the rest of the region (Agosin, Fernández-Arias, and Jaramillo 2009). Section V concludes and considers several possible escape routes from the low skill trap.

II. Constraints on Business Demand for Skills

This section examines business demand for skills from four main vantage points: 1) overall shifts in employment in the wake of market reforms, especially from manufacturing to services and commodity production; 2) weak demand for skilled labor by MNCs; 3) peculiarities of labor regulation and training programs sponsored by governments that favor in-house training;

and 4) trends in returns to education. Each perspective highlights limits on business demand for skills, especially compared to other countries and to past trends.[5]

Since the 1980s, the major shifts in employment in Latin America were from manufacturing to services, from the public to the private sector, from rural to urban areas, and from formal to informal employment (Stallings and Peres 2000; Palma 2005; IDB 2003; Lora 2008). Some of these were longer term secular trends, others responses to policy shifts. Trade openings forced uncompetitive manufacturers to close and many competitive ones to down size to improve productivity. Employment fell in manufacturing, and many technicians and engineers lost their jobs. Industrial employment held steady in Mexico, while it dropped throughout most of the rest of the region (Berg, Ernst, and Auer 2006, 19). In the 1990s, the greatest employment growth came in the service sector which accounted for "more than 95 percent of new net job creation" in most of the large countries (Stallings and Peres 2000, 198). Privatization, FDI, deregulation, and suppressed demand fueled booms in telecommunications, finance, insurance, and public utilities like electricity, but these sectors accounted for only about a quarter of new jobs. Other lower technology, low wage sectors like "commerce, restaurants and hotels, together with social, communal, and personal services, accounted for 74 percent of all jobs created in the region" (Stallings and Peres 2000, 198). The last major, overlapping area of growth was the informal sector which accounted for nearly 60 percent of new jobs, predominantly unskilled, in the 1990s (in one study of seven countries (Stallings and Peres 2000, 119)).

The commodity boom of the 2000s buoyed growth rates but did not boost overall demand for skilled labor (exceptional demand in Brazil is considered later). After 2000, international demand boomed for raw materials and semi-processed commodities like pulp and paper, minerals, metals (steel and aluminum), oil and gas, basic agricultural goods, and agro-industrial

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[5] The general comparative benchmark would be higher technology manufacturing in Asia, especially Taiwan and Korea. See Kosack (Kosack 2009; Kosack 2008) for an extended comparison of business demands for skills in Brazil, Taiwan, and Ghana.

products like fish, meat, ethanol, wine, and vegetable oil, sectors which generally had low demand for skilled workers (Kaufman and Nelson 2004, 251). Capital intensive sectors like mining and metals employ skilled workers but not many.[6] In Chile, for example, the copper sector accounted for some 15 percent of GDP but employed less than two percent of the labor force (Sehnbruch 2006, 92). Moreover, commodity production rarely entails an expansion of collateral high skilled areas like sales, marketing, research and development, or technical support.

Even before the commodity boom, Brazil's export sector was a drag on demand for skills. By the late 1990s, over seven million workers (12 percent of all workers) were employed in producing exports. Of these workers, 69 percent had only some primary education (0-7 years of schooling), 25 percent had some secondary (8-11 years), and only 5 percent had 12 or more years of education (Castilho 2005, 158–9). The growth of exports was thus reducing the demand for skills in the labor force where by 2002, across all workers, 56 percent had some or complete primary education, 31 percent had some or complete secondary education, and 13 percent had some post secondary schooling (IDB database, http://www.iadb.organization/sociometro/index.html).[7] Similarly, in Chile, the rapid expansion in employment (by over a third from 1988 to 1995) in four sectors that were leading growth in higher technology processing of natural resources (fruit and vegetable processing, seafood processing, industrial wood products, and pulp and paper) resulted not in an increase in the relative demand for skilled workers but rather a slight de-skilling of the workforce: skilled workers fell from 17 to 16 percent of workers in these sectors (Schurman 2001, 19)(see also Berg 2006).

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[6] McMillan and Rodrik argue (2011, 3) that, "the larger the share of natural resources in exports, the smaller the scope of productivity-enhancing structural change. The key here is that minerals and natural resources do not generate much employment, unlike manufacturing industries and related services. Even though these "enclave" sectors typically operate at very high productivity, they cannot absorb the surplus labor from agriculture."

[7] In broader macro terms, higher dependence on commodity exports is associated with smaller middle classes (Easterly 2001b).

Table 6.2 provides another more micro perspective on demand from big business for skills. The firms listed are the 10 firms (out of the largest 20 private domestic firms) that provided information on the skill profile of their employees (Schneider 2009). As noted above, large service firms expanded employment for university educated workers, but the larger commodity producers had much lower demand, especially in booming sectors like meat. This difference is illustrative of a broader division in employment among capital intensive commodity producers (steel, mining, and some mechanized agriculture, for example) that employ small numbers of skilled workers, and labor intensive producers, mostly in agriculture, that employ larger numbers of unskilled workers. This distinction is in flux, as some agricultural sectors have mechanized rapidly, shifting quickly from labor to capital intensive sectors. Soy production in Brazil went through an incredible transformation. From 1985 to 2004 production nearly tripled, but over the same two decades employment plummeted by 80 percent (Pérez, Schlesinger, and Wise 2008, 12). Labor productivity rose nearly fifteen fold from 11 to 149 tons per worker of annual output. Sugar cane production in Brazil has also mechanized rapidly with similar consequences for diminished employment. Mechanized agriculture requires more educated and skilled workers but not many of them.

Table 6.2. Education Levels of Workers in Large Private Brazilian Firms

As analyzed in chapter 3, the private sector historically invested very little in R&D, and the expansion of the largest business groups into commodity production is unlikely to promote much more investment. Total R&D in Latin America averaged less than half a percent of GDP (mostly public) compared to more than two percent for developed countries and much of developing Asia. Table 6.1 shows the association of higher R&D expenditure with higher levels of employment for researchers. Even at two percent of GDP, R&D does not generate much direct demand in the overall labor market. However, it can have a larger multiplier effect in increasing demand for skilled workers among suppliers, contractors, and workers in other parts

of the firm. In any event, the low levels of R&D in Latin America, especially in business, reduces demand for this very high skill employment.

FDI boomed after 1990, especially in the larger countries of Latin America, but it had a relatively muted impact on the overall labor market and did less than expected, given the magnitude of incoming investment, to boost demand for skilled labor (see Chapter 4).[8] First, much of the incoming investment was in acquisitions and therefore did not create many new jobs (Berg, Ernst, et al. 2006). Compared with the rest of the world, Latin America attracted only about five percent of new investment projects by MNCs (ECLAC 2005, 16).

Second, the expansion of outsourcing and global commodity chains along the US periphery (Mexico, Central America, and the Caribbean) created mostly low skill jobs, though this growth plateaued after the 2001 recession and the shift in low-wage assembly to China. Export manufacturing in Mexico employed workers -- even in higher technology sectors like electronics -- with lower education levels than workers in non-export manufacturing. Perversely, the arrival of new job opportunities in export firms caused students to leave school earlier than students in areas or periods without new export jobs (Atkin 2009). A study of 36 new or expanding maquila firms in the mid 2000s found they were hiring workers with nine or fewer years of education (Sargent and Matthews 2008).

Third, outside Brazil, MNCs did not bring R&D operations to Latin America, and even reduced some previous operations (in the auto sector in Argentina, for example), so their demand for engineers and scientists was low, and lower than for their investment projects elsewhere (ECLAC 2005, 17). MNCs tended to keep most R&D at home, and when they did offshore some operations they tended to opt for Asia or East Europe. Fourth, much FDI in Latin America continues to be resource seeking (as in mining) or market seeking (especially in larger countries) (Gallagher and Zarsky 2007, 17–8; Berg, Ernst, et al. 2006, 112). For resource- and market-seeking MNCs, labor market conditions are secondary concerns (as opposed to

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[8] Hanson (2008) provides an extended analysis of the absence in Mexico of a positive MNC effect on R&D, training, and education.

efficiency-seeking MNCs where the cost, quality, and availability of labor are primary criteria for investing in a country). These MNCs do employ technicians and university trained workers, but they rely heavily on in house training, especially for technicians rather than trying to hire skilled workers on the open market (with therefore a dampening effect on demand in labor markets, as discussed later).[9]

Fifth, skilled workers were often a small part of MNC work forces, and among unskilled workers MNCs (and large domestic firms) greatly increased the number of outsourced employees (*tercerizados*) who work in their plants and offices. In one extreme case, in the high tech IT sector in Guadalajara that relied primarily on unskilled workers, "the majority of workers (72 percent) are hired and paid by the more than 25 employment firms in the region. Sixty-eight percent of the subcontracted workers receive all their training at the employment firm, not from the high tech firm itself" (Gallagher and Zarsky 2007, 147). And about two thirds of these subcontracted workers had employment contracts of 3 months or less.[10]

Another clear empirical indicator of weak business demand for skills comes from training programs in Chile. Chile is a crucial case in labor market trends because Chile has been at the forefront of market reform and integration into the global economy, and is viewed by many as a harbinger of changes to come in other countries. Chile is also a revealing case because it has a voluntary training program which makes it possible to gauge employer interest (most other countries have compulsory programs). Firms that choose to train can deduct the cost from their income taxes (up to an amount equal to 1 percent of payroll). However, by the mid 1990s, "only a quarter of the available tax credit was being used" (Sehnbruch 2006, 180). Among the firms

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[9] A number of interviews with personnel managers in Argentina, Chile, and Brazil confirmed that MNCs have low expectations of workers coming out of the educational system and expect to spend a lot on training workers once hired (and pay them higher salaries to keep them from leaving once trained). See Vargas and Bassi 2010. Turnover in resource and market seeking MNCs is quite low (on Brazil, see *Folha de São Paulo*, 8 May 2011, Radiobrás email summary; on Mexican auto MNCs, see Carrillo and Montiel 1998).

[10] Sectors that are considered high tech in terms of products such as IT and electronics can be very low tech (and rely on unskilled workers) in much of the manufacturing process, especially simple assembly of components.

that did pay for training, most of the training went to already better paid and educated workers. Moreover, the training was concentrated in areas of general skills like administration, language instruction (mostly English), and computing. By 2010, the total cost of this program was only $226 million (or less than .09 percent of GDP) and 70 percent of the training courses funded by this program last less than 17 hours (Pumarino 2011).

The shortcomings of Chile's apprenticeship program provide another indication of the lack of employer interest in training. Initiated in 1988, with German technical assistance, the program was expected to attract some 10,000 apprentices. The government program allowed firms to hire apprentices at below minimum wage for up to two years and deduct 60 percent of the first year's wages from their taxes. However, only 532 apprentices were initially engaged, and in one survey over 80 percent claimed to have received no training in the previous year (Sehnbruch 2006, 194, 200), which would seem to confirm union fears that firms would use the program just to hire temporary workers at lower wages (interview with José Luis Sepúlveda, Corporación Sofofa, 16 March 2007).

Although overall and on average firms invest little in in-house training, some of the largest, more capital intensive, and foreign owned companies invest a great deal in some workers. Among MNCs, as noted above, market and resource seeking investors are less concerned about existing skills in labor markets and willing to invest in training workers and pay more to keep them (Atkin 2009). Turnover in large firms tends to be lower, so workers and employers have expectations of longer term relations (Menezes-Filho and Muendler 2007, 21). As an individual solution to the lack of a pool of skilled workers, firm investment in in-house training makes sense, but in aggregate it reduces the 'apparent' demand for skills in the labor market by shifting the demand curve left. That is, if firms expect to build skills rather than buy them, then they will not go into the labor market looking for technicians.[11] This is borne out in

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[11] A study of workers in manufacturing in Brazil in the 1990s found that "workers in occupations of intermediate skill intensity experience significantly fewer separations, and workers are significantly less likely to be hired into high-skill intensive manufacturing occupations (with a monotonic drop in accession odds as an occupation's skill intensity increases)" (Menezes-Filho and Muendler 2007, 23).

surveys where large firms in Brazil were less likely than small firms to view scarcity of skilled workers as an obstacle to growth, presumably because large firms are better able to train workers in-house (Blyde, Castelar, et al. 2009, 127). Overall, in São Paulo, returns to experience are much higher (though only for men, not for women) than in France and the United States which conforms to a build-rather-than-buy approach to skills (Menezes-Filho, Muendler, and Ramey 2008, 328). Among laid-off workers, those with longer tenure and higher skills suffered the most income loss which suggests both that these workers had more firm specific skills provided through in-house training and that other firms do not hire skilled workers but prefer to train their own (Pagés, Pierre, and Scarpetta 2009, 337).

Several other peculiarities of labor market regulation in Latin America increase incentives for large firms to invest in in-house training. Labor legislation in most countries of the region (Chile excepted) require firms to pay an annual tax, often 1-2 percent of their payroll, to the government for training. However, firms can request to keep the funds for in-house training at a cost at least equal to what they would have paid to the government fund. These requests are subject to government approval (rarely denied), and most large firms would prefer to train their own employees rather than contribute to a general fund. In the state of São Paulo, for example, around 20 percent of the compulsory tax was spent in house (interview with an advisor to Senai, 17 June 2009).

Severance costs in Latin America are among the highest in the world (chapter 5). Although not intended as a means to promote in house training, severance costs shift incentives in this direction. In a broader quantitative study, stricter labor codes (including high dismissal costs) were loosely correlated with more training (Almeida and Aterido 2008). The high cost of firing employees has a silver lining for companies that invest in the skills of their longer term workers, because -- if they move -- these workers lose their rights to seniority-based severance pay.[12] For example, workers in say their sixth year at a firm would usually receive six or more

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[12] Acemoglu and Pischke (1998; 1999) analyze various ways that labor market imperfections, information asymmetries, and wage compression give firms greater monopsony power and hence less concern about poaching and greater incentives to invest in training. Severance pay in Latin

months of salary if fired. These workers, usually part of a small core workforce, can thus feel more secure knowing that employers are less likely to fire them and have fewer incentives to accept other job offers, even at higher wages, because their seniority clocks would reset to zero, making them vulnerable to lay offs and without the insurance of a large severance payment (interviews with Jaime Campos, AEA and human resource directors at Hewlett Packard Brazil, 3M Chile, Cargill Argentina, and other firms, see Appendix A).

Some trends in returns to education and increasing university enrollments are positive. From one vantage a virtuous market dynamic seems to be at work: high returns to education (on average 6 percent for every additional year of school (Barro and Lee 2010, 43)) are encouraging ever more students to stay in school and go on to university. In manufacturing in the state of São Paulo, for example, employees with college degrees receive wages 150 percent higher than workers with some high school education. The comparable skill premium is 70 percent in the United States and 40 percent in France (Menezes-Filho, Muendler, et al. 2008, 325).[13] In services, especially high end services like finance, real estate, and communications demand for college educated workers expanded rapidly (Berg, Ernst, et al. 2006, 20). In the service sector in the state of São Paulo, workers with some college education grew from 9.4 percent of workers in 1990 to 11.3 percent in 1997 (calculated from Menezes-Filho, Muendler, et al. 2008, 327).[14]

By the end of the 2000s, an IDB report identified skills as a main, binding constraint on growth in three countries of Latin America, Brazil, Chile, and Guatemala (Agosin, Fernández-Arias, et al. 2009, 36).[15] Brazil and Guatemala ranked first and second in a sample of 12

America operates in similar fashion.

[13] Median hourly wages (the real and dollar were close to parity) in 1996 were 9.2 for workers with some college, 3.6 for workers with 9-11 years of school, 2.3 for workers with 6-8 years, and 1.8 for workers with 4-5 years (Menezes-Filho, Fernandes, and Picchetti 2006, 409).

[14] The salary premium among university graduates in services may contain a large class component, as much as 25-35 percent according to one study in Chile (Núñez and Gutiérrez 2004). In manufacturing, in contrast, in the state of São Paulo, workers with some college education fell from 3.7 percent of all workers in 1990 to 3 percent in 1997 (calculated from Menezes-Filho, Muendler, et al. 2008, 327).

[15] In Mexico, in contrast, many college graduates were un- or under-employed (as discussed in the next section), and eight percent of Mexican professionals were working in the United States (Elizondo 2011, 199).

developing and transition economies in terms of the percentage of business respondents that viewed skills as a major constraint (Artana, Auguste, and Cuevas 2009, 259). Returns to education were also quite high in these countries. However, current scarcity in the context of resumed growth in the 2000s is a reflection of low previous investment in skills. Moreover, even though countries like Brazil rank high in international comparisons of how many firms see skills as a constraint, firms did not rank skills highly compared to other constraints: skills ranked only 13th of 21 different obstacles (Blyde, Castelar, et al. 2009, 127).

Although good returns to education signal business demand for skills and willingness to pay for them, several other trends belie an overly optimistic hope for a spontaneous, market solution to the low skill trap. The first is comparative. Returns to education in Latin America, though positive and significant, remain the lowest of all world regions and just over half of the world average (Figure 6.1). If returns to education depend in large part on business demand, then business in Latin America has comparatively little demand. And, the lower returns in Latin America are not due to higher supply than in other regions; average years of education and proportion with college education in the adult population are at or below what would be expected from average income levels (Chapter 5).

Figure 6.1 Rates of return to an additional year of schooling, by region (Barro and Lee 2010, 43).

The second troublesome trend is that rates of return to education started to fall in the late 2000s even as growth in GDP ticked up (World Bank 2011). Several factors may contribute to this decline. The rapid expansion of tertiary education, for example, some of it of low quality may mean that students are getting low quality training or that their skills do not match market demand. In addition, lower income students who started staying in school and going on to university may be running into class barriers to high income jobs. Although a number of factors may be pushing returns down, a key component is presumably business demand for skills, which

on average then, is not keeping up with supply. Since the decline in returns to education is happening at a time of high economic growth and low levels of overall education, it provides a good indirect indicator of a low skill equilibrium.

In sum, a number of factors limited business demand for skills, both historically and in recent decades. Since the 1990s, employment dropped in manufacturing and expanded in services, but in barbell fashion with high demand at the low and high ends. The following surge in commodity exports increased demand for unskilled workers relative to technicians and university trained workers. Moreover, the institutional incentives of labor market regulations on training and severance pay encouraged firms to train in house, raising returns to strategies to build rather than buy skills, and thereby reducing market demand for skills.

III. Limits on Individual Demand for Education

Good returns to education would seem to augur well for a market solution to enhancing human capital. Given positive returns, rational families and individuals should strive to invest more in education, and recent increases in secondary and tertiary enrollments suggest this may be happening. However, it is important to put these returns in comparative and historical perspective. As noted in the previous section, returns to education are lower in Latin America than other regions and returns have been falling in recent years after what may have been a transitory spike in skill-biased technological change in the wake of market reforms of the 1990s (López-Calva and Lustig 2010). Both these factors mean economic incentives for students are comparatively and historically low. Moreover, a disaggregated examination shows a more complex picture, especially considering the quality of education provided and the uneven distribution of returns across social classes.

The main questions are when and why do students decide to end their formal education. The economic hypothesis is that students drop out when the opportunity costs (including broader calculations of family welfare) exceed the perceived gains from marginal investment in education. For any individual, a myriad of factors -- their own talents and aptitudes, family

resources and structure, macro and local economic conditions, migration opportunities, etc. -- go into the decision process. For Latin America, it is important to add that many, in some instances most, students are not faced with an either/or decision, as large numbers of students in secondary and tertiary education combine work and school. Public secondary schools typically run two 4-5 hour shifts, so students can go to school and work nearly full time jobs. Among 16 to 18 year olds attending school, about a third of poor students in Brazil (and nearly a quarter of wealthy students) and about one half of poor students in Bolivia were working at the same time (World Bank 2006b, 86). In tertiary education, most of the recent expansion in enrollments has come in night and weekend courses. Unlike more structured career systems, as in Germany, where students have essentially one chance to get on the technician or university track, students in Latin America are usually making ongoing decisions on investment in education and simultaneous decisions about not only the kinds of education that will get them to the ultimate jobs they want but also the kinds of jobs that will allow them to get the education they want.

One of the most thorough studies of adolescent behavior throughout the region noted that students were more likely to work full or part time if their parents had little education, if they had many younger brothers and sisters at home, if the family income was low, and if youth unemployment was high (Menezes-Filho 2003).[16] This study though focused almost exclusively on the constraints that kept students from investing in education and concluded, "Thus, in order to increase schooling levels in Latin America, it will be necessary to disseminate information on the economic returns to education, as well as find alternative forms of care for young children so that older siblings do not have to drop out of school" (Menezes-Filho 2003, 143).

Presumably most teenagers form initial expectations about career options from watching and listening to family and friends already in the labor market (and most people in Latin America rely on family networks to find jobs (Pagés, Pierre, et al. 2009, 379)). The majority of teenagers in Latin America would thus be hearing stories about short job tenure, frequent job

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[16] Additionally, students are more likely to leave school to work if one of their parents loses a job (Duryea, Lam, and Levison 2007).

changes, and wide movement across sectors, and back and forth between formal and informal employment (see Chapter 5). For some economists, the high movement of workers among jobs is often taken as a positive indicator, especially in the wake of market reforms of the 1990s, of flexibility and rapid adjustment to new opportunities. This may well be part of the story, but the effect on new entrants into the labor market is to make their futures look more uncertain and therefore likely to discourage investment in skills. In these fluid circumstances, job opportunities may drive education decisions more than vice versa -- students may move among temporary jobs, making marginal investment in education along the way, until they land one of the few lasting positions in the third segment of the labor elite, usually in the public sector, MNCs, or large domestic firms. Turnover in these firms is often much lower than the mean, and, where internal career ladders exist, incentives for stable employees to invest in education and training are high.

Younger students are probably also watching how those immediately ahead of them are faring. Although returns to education are high on average, investment in human capital carries significant risks. In Mexico in 2002, 22 percent of 15-29 year olds with 10-12 years of school and 9 percent of students with some college were in low productivity jobs in the informal sector. Unemployment rates for these two groups in 2002 were 6 and 10 percent respectively (Heredia 2010, 14). In other words, 19 percent of workers with some college were out of work or getting by in the informal sector (up from 11 percent in 1989).[17] Given these risks in investing in education, it is not surprising that 70 percent of the 20-24 year old cohort left school without completing secondary education (Heredia 2010, 15).

Many students do drop out of secondary school, which makes sense given the opportunity costs of staying in school, and the lower rates of return to secondary schooling.[18]

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[17] In addition, there is evidence that higher skilled workers are working in jobs below their skill levels, as in engineers filling jobs previously done by technicians (Gerardo de la Peña Hernández, Director General de Capacitación e Innovación Tecnológica de la Secretaría de Economía, Mexico, 17 February 2011).

[18] Kaufman and Nelson conclude that, among the poor, “the expectation of limited return to skills did much to account for high dropout rates at the primary school level” (2004, 251).

However, many students also stay on to complete traditional secondary school. Given that the quality of secondary education is generally low and does not provide most students with skills directly relevant to the labor market, why do students stay on? Presumably many students complete secondary school not for any intrinsic value it may impart but because it is required to start in tertiary education (IDB 2001, 125). Although the monetary returns to secondary education are low, a secondary degree may be important for employment in the formal sector which carries other important non-salary benefits such as inclusion in the pension and health care systems and legal protections.

Moreover, many firms establish high minimum credentials for jobs (whether or not the jobs require any school skills). Interviews with several employers confirmed the expansion of 'credentialing' (where firms require diplomas even when the job does not require that particular level of education). Employers with good jobs to offer get so many applicants that they can afford to set education requirements higher than necessary, and may do so in part to screen for middle class background and social skills. So, for example, a small metal working shop in Argentina requires entry level employees to have a high school degree and a US MNC in São Paulo requires receptionists to have college degrees (interviews with managers, 5 September 2007 and 14 September 2007). In both cases, the employers had little or no expectation of the skills acquired in school and planned long term investments in on-the-job training of new employees.[19] A broader survey of employers found a similarly dim view of the value of what students actually learn in school and concluded that firms 'hire for attitude, train for skills' (Vargas and Bassi 2010)

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[19] The expansion of credentialing offers hypotheses for explaining two puzzles in Latin America. The first is the high rates of grade repetition by secondary students. Why, if there is an opportunity cost to staying in school, do students repeat grades, even when schools are not providing adequate support to pass to the next grade? Presumably the calculus is that a low intensity investment in secondary education may ultimately yield a useful credential. A second puzzle is that despite large, sustained increases in public investment in secondary education, test scores remain low. Again, the credentialing hypothesis is that students are not motivated to work in school and to study to acquire skills but rather go through the motions to get the credential.

The quality of tertiary education is also very heterogeneous. A minority of top students go to a handful of the most selective universities (often public and free) and get the best jobs when they graduate. The majority of students though go on to low quality universities and often study at night after working during the day (Nunes, Martignoni, and Carvalho 2003). The quality of many of these programs is so low that they may do little more than fill in holes in what students missed in secondary school and signal to prospective employers that the candidates are willing to work extra to invest in skills.[20] And, low quality education does not require much exertion on the part of students, which suggests a note of caution when interpreting data on the increase in post-secondary enrollments. If enrollment figures could be adjusted for the actual time and efforts put into their studies, the increases in tertiary education might be less striking.

Many initial hiring decisions screen on other non-skill criteria like appearance, social skills, cultural capital, and networks, all of which favor students from middle class backgrounds and help explain the sometimes large differences for returns to education for rich and poor students (Perry, López, et al. 2005). The contrast with Asia on this dimension are stark; in seven of eight Asian countries returns to education were higher in lower income quintiles whereas in seven of eight countries of Latin America, returns to education were higher for higher income quintiles, almost double in Bolivia, Brazil, and Chile (Di Gropello 2006, 76–7). Differential returns according to background also increase risks: "poor people may face more labor market risk, or may be less able to hedge against it, and thus find returns to investing in human capital adjusted for risk to be less attractive" (Perry, López, et al. 2005, 6). Thus, perversely, incentives for investing in education among the poor and disadvantaged ethnic groups are likely to be especially low.

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[20] Mexico and Korea offer stark contrasts in demand for post secondary technical education. Both countries have two year technical colleges: enrollment in Mexico is 60,000 compared with 900,000 in Korea (a country with less the half of Mexico's population). And, while most of Mexico's technological colleges are public 96 percent of Korea's college are private, demonstrating very high demand by families willing to pay tuition (Hanson 2008, 96).

Many of the skills valued in the service sector such as communication and social skills depend on prior socialization and cultural capital not imparted in school or training courses. Ethnic and class screening is even more likely for high end service jobs -- the most rapidly expanding high skill sectors -- where employers are looking for additional social, communication, and team skills. Having the right manners, accent, appearance, and name can be indispensable to advancement in high end service jobs and therefore necessary to realize the full return on investment in training. According to a recent IDB study, employers look first to hire people with non-technical skills such as strong motivation, good attitude towards work, problem solving ability, and teamwork and communication skills (Vargas and Bassi 2010). Job ads often list "good appearance" among the main qualities sought in applicants, and it is generally perceived as a means for screening applicants for appropriate class, ethnicity, and race.

Low cultural capital starts with parents without much education and working in low wage jobs. Cultural capital is used as a generic term that could also include various linguistic, racial, and cultural barriers, especially in countries with large indigenous or black populations. Extensive household surveys find that parental education has the greatest impact on decisions to stay in school (Menezes-Filho 2003, 112, 141). One interpretation is that parents without much education value it less and therefore push their children less to continue in school (and provide them less help in studying). Another complementary interpretation is that parents with low education cannot impart sufficient cultural capital for their children to be able to realize the returns to higher education in high wage jobs that require extensive social and cultural skills. The importance noted above of family networks in securing employment further limits the ability of poor families to help their children get into high end service jobs. Evidence that returns to education in Latin America are generally lower for lower income families fits with this argument. And, of course, casual observation in Latin America reveals very few people from ethnic minorities in high end service jobs. It may in fact be the case that social mobility through

education was easier in manufacturing that did not require many social and communication skills or contact with middle class customers.[21]

In sum, given declining returns that were already low by international standards, individuals have weaker incentives to invest in education. And, given comparative low returns, low exertion in low quality programs make sense. Lastly, the barriers to social mobility and lower returns to education for poorer students further reduces individual incentives and demands.

IV. Weak Political Demands for Education

A supply-side exit route from the low skill equilibrium might come from governments promoting 'over' investment in education to the point where firms recognize that they are headed toward a high skill equilibrium and shift investments to take advantage of the large pool of skilled workers (see chapter 7 on Chile). To understand the absence in Latin America of such a 'big push' from politics, requires an examination of the various groups that might join an education coalition.

The middle class is pivotal in structuring both the market for education and political demands for public provision. In the social pyramid in Latin America the "middle" class was historically small in terms of income and occupation and actually closer to the top than the middle of the distribution. Over the course of the 20th century much of this middle class exited public education, especially at the secondary level. By the 2000s, private schools in Latin America accounted for 10-25 percent of enrollments of 17 year olds, and more in poorer countries of Central America. In the wealthiest quintile, around half of students went to private schools (IDB Sociometro). As the middle class moved into the private sector, its political self interest adjusted to favor subsidies for private schools over more government spending on public schools, and more generally, "highly skewed distributions of income increased the inclination of

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[21] Educational mobility has fallen in Mexico. The odds of getting a tertiary education, for children whose parents did not, fell from .62 for children born in the 1940s to .23 for children born in the 1970s (Heredia 2010, 18).

upper-income families to resist taxes for public education..." (Kaufman and Nelson 2004, 250–1). These preferences made the middle class less available as a potential partner for a coalition with poorer groups, a coalition that could in principle be sufficient to alter government policies on education.[22] In terms of existing spending, middle class families favored more subsidies to higher rather than basic education, because after completing secondary education in private schools, many of the best students went on to study in public universities. And, public spending on education in Latin America is highly skewed to tertiary education (Rodríguez 2006, 109).[23]

Even if the middle class lacks interest in pushing for more public investment in basic education, the poor should. However, the poor were politically excluded for much of 20th century through authoritarian rule or through cooptation and clientelism in more democratic interludes (see Kurtz 2004). Democratization in late 20th century did increase political pressure, and governments devoted more resources to education (Brown and Hunter 2004), but the shifts were not dramatic, and education levels remained on average below what would be expected at their income levels (Wolff and Castro 2003; Kosack 2009). Overall, governments in Latin America redistribute very little (Goñi, López, and Servén 2008; Schneider and Soskice 2009), and under investment in education for the poor conforms to this pattern.

In principle, business everywhere should have a preference for a large pool of well-educated job applicants and especially where skills have emerged as binding constraints on growth, as in Brazil and Chile. There are some indications of a growing concern among business in Latin America with education, and in some countries "associations of industrialists are now

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[22] As two education experts at the IDB put it, "for the most part, the children of the politically influential people attend private primary and secondary schools. Thus they do not directly feel the deficiencies of the public school system... This reduces the sense of urgency that might otherwise lead influential parents to press decision makers to make tough policy choices, and makes it harder to put together a political coalition willing to pay the high political costs that come with making basic changes in public schools" (Wolff and Castro 2003, 205).

[23] See Fernandez and Rogerson (1995) for a general model that predicts education spending to be skewed to higher education and wealthy families, especially in more unequal societies. Private tertiary education has ballooned in recent years, so the dependence of the middle class on public universities is fading. In Brazil, by the 2000s private universities enrolled over two thirds of students. However, many private universities depend on public subsidies, so middle class families may still favor shifting more public resources from basic to tertiary education.

taking a stand on education and training issues" (Wolff and Castro 2005, 22).[24] However, effective, sustained political action has been rare. A comparative study of educational reform in Latin America found that, despite the pressures of international competition, there was "little evidence that business groups actually lobbied for" upgrading skills (Kaufman and Nelson 2004, 267) (see also Grindle (2004, 198)). Among developing countries, Brazil ranked quite high in terms of the percentage of firms that reported that the skills and education of available workers were serious constraints on growth (World Bank 2004, 136). Yet, despite these concerns, business in Brazil was not a major supporter of educational reforms in the early 2000s (interview with Maria Helena Castro, 8 December 2005).[25] In his comparative study, Kosack (2009) finds that business in Ghana and Brazil was never politically mobilized to demand education the way it was in Taiwan from the 1960s to the 1980s.

Several factors weaken the impulse by business to push for education. First, education policy is not an area conducive to political engagement by business. It is a policy that bears fruit only over the long term, and requires sustained monitoring and pressing for effective implementation. Such engagement in turns depends on strong, well institutionalized organizations of business, which are rare in Latin America. Education is also an area where business preferences are usually heterogeneous which impedes consensus building on policy priorities. Lastly, education is a broad encompassing policy area where temptations to free ride in political activity are stronger (Schneider 2010).

Second, for many firms, low levels of skills and education may not be a problem, especially compared to other areas of government policy such as taxes, infrastructure, and macro economic policies that may have a more immediate impact on profits. As noted in the previous section, many of the commodity and service sectors that expanded after 1990 created jobs that

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[24] In the 2000s, business backed the creation of several visible associations pushing for education, especially Mexicanos Primero (interview with David Calderón, director of Mexicanos Primero, 16 February 2011) and Todos pela Educação (Brazil) (Simielli 2008).

[25] Other top officials in education confirm the lack of interest or pressure by business in education policy (interview with José Pablo Arellano, 9 January 2012.

did not require much education. In some cases, employers went so far as to oppose investment in education. Textile manufacturers in northeastern Brazil hired mostly workers with low educational levels at low wages. These manufacturers feared that more educated workers would either demand higher wages (which would undermine their competitiveness in global production networks) or move south in search of better jobs (Tendler 2002).

Third, many of the largest, most sophisticated firms, whose participation is essential to any broad business push for education, often find workable private, firm-level solutions to their skill needs. One option is poaching; MNCs and larger domestic firms can afford to pay higher wages to hire workers away from smaller domestic firms. Such wage differentials may be 'justified' in part by higher productivity, but they also allow MNCs to recruit away the skills they need. As noted earlier, large firms also invest a lot in in-house training. Some large firms even have well established internal educational divisions or subsidiaries.

Fourth, among big businesses, MNCs are especially hard to mobilize into coalitions for education. MNCs generally shy away from visible engagement in broad, and potentially contentious, policies like education reform (see Chapter 4). Moreover, most MNC strategies do not depend on large pools of skilled workers. Market and resource seeking MNCs are often capital intensive, employ relatively few workers, and devise private, in-house solutions for their skill needs. Location decisions are based primarily on product market or natural resource calculations, and costs of training workers can be factored into location decisions. The situation is very different for efficiency seeking MNCs for whom the cost and availability of labor determines profits in highly competitive international markets such as textiles. In these competitive, low margin sectors, in house training would add too much to costs, so these firms might have an interest in joining coalitions for education reform. However, changes in many of these markets occur so quickly that firms are more likely to use exit rather than voice, as the many labor intensive maquiladoras did when in the 2000s they moved from Mexico to China.

Another example from the state of São Paulo illustrates the weakness of both market and political demand for skills. The state-level training body Senai is funded by a one percent tax on

payrolls. A body dominated by business then decides how this fund should be used to provide training. Until recently, the goal was to train workers in skills for which short term demand was easy to verify (as one Senai official put it, 'we do not train people for unemployment,' interview 17 June 2009), even if this meant turning away potential students. In essence, Senai was explicitly targeting a low skill equilibrium. In the 2000s the minister of Education intervened to require Senai to open its doors and provide training to more applicants, and such training beyond existing demand in the labor market grew to account for about a third of total Senai training (interview with Senai advisor, 17 June 2009).

Beyond particular groups, overall opinion surveys show little preoccupation with improving education. Respondents in Latin America are more satisfied with the quality of education than counterparts in other regions, and especially with respect to actual performance on tests (Lora 2008, Chapter 6). And, respondents with low education were more satisfied than those with higher education. In another survey in Brazil in 2006 on crucial problems facing the country, education came in seventh place (Abrucio 2007, 52).

It also bears noting the historical absence of sundry political movements and ideologies that spurred mass education elsewhere, most of which sought to prevent or correct undesirable behaviors and upbringing rather than impart skills that businesses needed. For example, religious and civic reformers in early 19th century United States pushed universal education to stem moral decay. For nationalists in 19th century Europe and later elsewhere, universal education was a crucial strategic instrument for spreading dominant languages and new national identities (Anderson 2006). While similar movements emerged in some periods or areas of Latin America, they lacked sustained force and scope to push governments to full universal education (Sokoloff and Engerman 2000). This sort of movement was the hope expressed in a World Bank report: "an important element of a deeper education strategy could be the introduction of a civic drive, involving both the public and the business sector, to achieve a significant jump in both coverage and quality across the public school system..." (de Ferranti, Perry, et al. 2004, 7).

VI. Conclusions and Possible Escape Strategies

Multiple complementarities reinforced the low skill equilibrium in hierarchical capitalism, as summarized in Figure 6.2. The demand for skills was comparatively weak on all sides but especially on the part of firms, both domestic and foreign, and individuals (or adolescents and their families) as they decided their investment strategies. Elements of atomized labor markets, especially high turnover and informality, discourage investment in skills. In a vicious cycle, low skill levels in labor markets also encouraged, or increased returns to, less skill intensive investment by business. Weak labor market demands for skills were also reflected in the absence of a forceful political coalition to expand education historically and improve quality in the 21st century.

Figure 6.2. Complementarities between Firm Strategies and Skills

Although difficult to assess directly, low business and individual demand for education likely affects overall education spending and its efficiency (educational achievement levels for amounts spent). Much of the discussion of efficiency of education spending focuses on sources of waste such as bureaucracy or incompetent or absent teachers. However, lack of student and family effort and energy may also be a source of low achievement, independent of supply side problems. This is not to blame the victim but rather to highlight that a low skill equilibrium raises the opportunity costs of studying. Where credentialing is widespread, students know the content of instruction is not important beyond the minimum they need to know to get to the next grade level. In Mexico, controlling for socio-economic background, students in private schools scored only marginally higher on the PISA test (17 points on average) than students in public schools (Elizondo 2011, 190). Given the relative lack of resource constraints in private schools, the test results would seem to reflect more about family and student choices (and suggest that families are willing to pay high tuition fees more for network benefits than education). If getting into university is relatively easy and not based heavily on performance in secondary school, and

if performance in university is less important than networks in getting jobs, then investing in more effective secondary schools and more studying is unnecessary. Overall, in broader comparative perspective countries in Asia like Japan and Korea, where entrance into university is extremely competitive, and choice jobs go to top ranked students at top ranked universities, private investment, much of it in extra tutoring, signals higher private and family investment in achievement.

Short of an economy-wide push to a high skill equilibrium, several countries in Latin America have had partial success in particular industries or with policies on either the demand side or the supply side. In Brazil, historically, two sectoral examples stand out of cutting edge technological development and high level skills, education, and training. In an unlikely story, the world's third largest manufacturer of aircraft is the Brazilian firm Embraer (Goldstein 2002). After thriving in the 1990s in the small regional jet market, Embraer expanded successfully into a broader range of smaller and larger aircraft. Also in Brazil, the state oil firm Petrobrás has become a world leader in deep water exploration. In both cases, the state, and within it the military, pushed long term investment in engineering and training programs, beginning in the 1950s and 1960s and promised jobs to those who invested in skills. In the early years, the military even assigned active officers to undertake university training in engineering, though even civilians had few doubts on the likely career payoff of investing in education in petroleum or aeronautical engineering. However, these are exceptions that prove the general rule in Brazil -- in the absence of exceptional state investment in skills and employment, the low skill equilibrium was the common outcome.

Countries like Korea and Taiwan that escaped the low skill equilibrium in the span of only a few decades in the late 20th century did so with massive shocks on both the demand and supply sides. Cases of positive shocks in Latin America in recent decades have been more one sided: strong on the demand side in Brazil and on the supply side in Chile. Brazil in the 2000s rapidly increased demand for skills to the point in the post 2009 recovery that skill shortages were widespread. This demand side shock was partly the result of commodity-led growth

(especially in more capital and skill intensive commodities), but also the result of renewed industrial policy and a sustained increase in investment in science, technology, and research and development (see Chapter 8). But, while some high tech segments of the economy are booming, demand for skills may have difficulty filtering through the rest of the economy (and hence shifting the education decisions of masses of young people) where low skill jobs still predominate.

In another case of demand side shock, Costa Rica used the winning of an Intel chip factory in the late 1990s as a cornerstone of a high-tech export strategy. While still playing to mixed reviews, Costa Rica transformed its export mix and drew many more students into informatics (World Bank 2006a; Paus 2005). Although the Intel plant has not generated a lot of spin-off firms or local suppliers, Costa Rica has become a preferred location for IT related investments by MNCs (Hewlett Packard, for example, set up a 4,000 employee technical assistance operation in the 2000s). In essence, small countries can agree on something like a multi-agent contract where governments and large firms make long term commitments to increase and coordinate the medium term supply of, and demand for, higher skills.

Chile, in contrast, has pushed harder on the supply side with massive and sustained investments in education. By 2005, 64 percent of 25-34 year olds had at least a secondary degree, more than the 38 percent in Brazil, 24 percent in Mexico, 36 percent in Turkey, 43 percent in Portugal, and equal to the 64 percent in Spain (but less than the 97 percent in Korea) (Heredia 2010, 5). College age enrollment in tertiary in Chile boomed in the 2000s to around half. Where the Chilean strategy was lacking was in promoting the expansion of technical education and policies to expand higher technology growth and hence the demand side for skills. The commodity boom did fuel high growth, but did not, as in Brazil, have a strong multiplier effect in other higher technology sectors. Although partial and late, the CNIC strongly promoted this multiplier effect through financing for R&D. The Chilean strategy was premised more on the theory that if they build skills, the jobs would come.

Brazil and Chile are promising exceptions, but they also are rare and show how large an exogenous shock is needed to shift, even partially, the low skill equilibrium. Chapter 8 returns to the demand shock in Brazil and the supply shock in Chile.

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