

Rethinking Informality
(Preliminary Draft)

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1. The informality puzzle

Structural change—the shift out of subsistence agriculture into manufacturing—was supposed to result in high-quality, high-productivity jobs and trigger a self-reinforcing process of capability building, ultimately reflected in economy-wide productivity gains. Instead there has been an involution, particularly in Africa and Latin America. Along with a modern sector competitive in world markets, development has produced large, low-productivity, low-quality and low-wage manufacturing, agriculture and service sectors operating beyond the regulatory and tax authority of the state, and often without the obligations and protections of private law. The traditional hope that the growth of an industrial modern sector would absorb this informal sector together with the traditional, subsistence economy has proved mis-placed. Industry is no longer the high road to development. In the absence of alternatives in many parts of the world dualism has been recreated, not overcome.

In countries like Peru, 75 percent of the work force is employed in the informal sector. The share of informal labor has remained stubbornly high despite more than a quarter century of growth averaging 5 percent per year.¹

In Mexico, according to a study by the McKinsey Global Institute covering the period from 1999 to 2009, the modern sector of large firms (employing 500 or more workers) increases productivity by 5.8 percent annually. It coexists with a large, mostly informal sector of small and micro-enterprises (employing 10 workers or less) in which productivity *decreases* by 6.5 percent annually. The productivity gap is getting bigger. In the decade covered by the study the ratio of labor productivity between the large and small firm sectors more than tripled, from 3.5 to 11. The share of workers employed in the informal sector in this period increased from 39 percent to 42 percent and the labor share in the modern sector, having earlier grown earlier, stagnated.² Development has, if anything, here gone into reverse, leaving theories of structural change at a loss.

In this paper we argue that while the focus on dualism highlights the failures of the industrial model of growth, it obscures a crucial potential of development: the firms in manufacturing, agricultural and services in the informal sector which have many, but not all, of the capacities needed to join domestic and international supply chains that could in turn connect them to new markets and afford opportunities for further development. Firms in this intermediate position are neither fully traditional nor modern under any of the current understandings of those terms, yet they are within striking distance of the modern economy. They operate (well) beyond the level of subsistence, using materials and methods more likely to trickle down, or be cast off from more advanced enterprises than inherited from tradition. But the capacities they have accumulated do not equip them to compete with dynamic firms in the vanguard of the

¹ Peru is an outlier in the sense that its informality level is easily 20 percentage points above others at a comparable level of per capita income and development; but there is nothing unique about its circumstances.

² These results are consistent with Levy's results (2018, p. 130) from Mexico: between 1998 and 2003 there was employment growth of 115 percent in the informal sector and 6 percent in the formal economy. And between 1998 and 2013, while formal employment grew around 50 percent, informal employment doubled.

economy. Even if they have met all formal regulatory and tax obligations (and most have not), these firms must still meet the requirements for reliability and quality set by potential, dynamic-sector customers; and since the requirements for entry gradually but inexorably increase, new entrants must in addition demonstrate the capacity for continuous improvement just to maintain a place on the bottom rung of a modern supply chain, to say nothing of the further accomplishments expected of firms that aim to climb higher.³ We will say that high-potential firms or farms deciding whether to trade the freedom of maneuver characteristic of the informal sector for the combination of disciplines and opportunities associated with participation in the modern sector via supply chains face a quality hurdle. We will see that especially in agriculture—a crucial sector for “modernization” given the blockage of industrialization strategies—firms can clear the quality hurdle, but seldom as the isolated, individual actors they are taken to be in neo-dualist accounts and development economics generally. Success typically depends on cooperation among farmers in associations or cooperatives and between these groupings and buyers.

We do not attempt to estimate the weight of such high potential, informal sector firms in any economy; nor do we offer any rigorous assessment of the costs and benefits of cooperative mastery of the quality hurdle. Rather, we read the recent literature on dualism and structural change against the grain, supplement it with our field work in Peruvian agriculture and connect it to current work in agricultural economics, to show that high-potential, informal-sector firms are much more prevalent than current theories of development lead us to expect, and face problems—and could benefit from corresponding policies—which these theories do not contemplate at all. Such policies are not a panacea for the problems of development. But they are, we argue, more promising than the policies derived from the familiar, and now exhausted, structural view of economic modernization and the strategies for accumulation for individuals or small groups that follow from many neo-dualist discussions of obstacles to development.

In the next part we review explanations for the persistence and expansion of informality that focus on perverse regulation and show why these have been for the most part rejected in favor of neo-dualist accounts emphasizing perversities in the nature of markets or technology or deficiencies in the endowments of firms. In Part 3 we show that neo-dualism, for its part, exaggerates the duality of developing economies, overlooking important evidence of the “lumpiness” of the capacity distribution of firms above the subsistence level but still within the informal economy as generally defined. Relatedly, we show that in attending often to the situation of firms and individuals just above the level of subsistence these theories have ignored the distinctive problems and opportunities of firms that are more capable yet still not qualified for participation in dynamic supply chains: firms facing the quality hurdle. In Part 4 we provide a case study of Peruvian smallholders growing fresh produce for sale to domestic supermarket chains and exporters to illustrate both that small

³ It would be more accurate to speak of a quality ladder than a quality hurdle since firms seeking to move up in the hierarchy of the supply chain by taking on more and more demanding tasks must master a sequence of skills—the steps in the ladder—knowing that success in earlier stages does not assure success in later ones. But the initial decision to trade the autonomy of operation in the informal sector for the lucrative constraints of the modern supply chain seems more constraining—more nearly irreversible—than later decisions to climb the next rung, and we will say that firms presented with the first, fateful choice face a quality hurdle.

producers can clear this hurdle but also how—in the near absence of public support in Peru—they must rely on assistance from their customers and the socialization of costs of learning through association to do so. The current literature in agricultural economics, well aware of the distinctive problems of developing economies but inattentive or simply indifferent to the categories and models of “high” development theory, finds strikingly similar outcomes in supply chains in Asia, elsewhere in Latin America and Africa. Analytically this literature links the spread of quality-differentiated markets to forms of vertical coordination in which concentrated or oligopsonist buyers (if they cannot vertically integrate into farming) have incentives to train suppliers to meet standards and pay an above-market “efficiency premium” when they do.

In Part 5 we begin—but only begin—to extend the argument to policy. We characterize the public policies for place-based capacity building called for when the private incentives for smallholder development fall short. Returning to Hirschman’s well-known discussion of project management under uncertainty and the debate it touched off we suggest that development practitioners have convinced themselves that just such place-based policies are unworkable, or at least unworkable in major, multilateral development institutions—even as outside those institutions many other actors, public and private, are making close analogues of those policies work. Just as development theory in its continuing bafflement at the failure of the traditional, structural model is overlooking an important opportunity for growth in the informal sector, development practice scants new approaches to management that could put this opportunity to good use. Now of all times we don’t have opportunities to waste.

2. The competing explanations of the dualism

Much current discussion of dualism start with this question: Why don’t the big, efficient modern firms expand into the markets of the traditional or informal sector? Alternatively, why don’t the informal firms use their cost advantages to increase efficiency and cannibalize the big ones? There are two competing explanations of this puzzle, the first type emphasizing incentives created by legal provisions, the second the nature of markets and firms. Each of these broad positions has been developed in two variants.

The first variant of the legal incentives view, associated with de Soto, is that informal firms are held back by burdensome government regulations and the weak enforcement of the property rights of small owners. Discriminatory regulation and weak property rights result from some combination of public sector incompetence and self-interest lobbying by rich incumbents (Soto 1989).⁴

The second variant of the legal incentives view, advanced by Levy (2018), argues to the contrary that politicians side with the *informal* sector. They impose taxes that penalize growth and subsidize inefficient, small-scale production. Informality expands because the state makes it costly for firms to grow. It makes sense to stay small.

The alternative view, neo-dualism, revives Arthur Lewis’ theory that informal and formal firms operate in different markets, separated by structural barriers: informal-

⁴ Closely related mechanisms are based on the idea that small firms are credit constrained.

sector firms produce low quality goods for poor customers and lack the capacities to improve. This structural separation explains why informal sector firms cannot enter the formal sector, but also why it is not worth the while of formal firms to enter their inferior markets (La Porta and Shleifer 2014). Informality is the new subsistence—a source of labor and nothing more. One variant of this dualist view focuses on the near impossibility for firms and individuals near the subsistence boundary to accumulate the capital needed to enter the modern sector (Banerjee and Duflo 2011). From this perspective firms can progress only by the superhuman efforts of exceptional entrepreneurs, and the only practical way to eliminate the informal sector then is to grow the modern one.

In a second variant of the neo-dualist view formal and informal sector firms share many characteristics, but the growth of informal sector firms is likely to be stunted by the lack of managerial resources, in short supply in developing economies. An extension of this view is that inescapable poverty traps—a canonical form of dualism in which it is irrational for poor actors to try to escape their poverty—are relatively rare, resulting from particularly unfavorable combinations of firm or individual endowments and market context. Practically speaking, however, the policy prescription of this second variant of the neo-dualist view converge with that of the first: the informal sector is, at best, a store of resources that can be put to productive use only when incorporated in the modern sector.

We consider the two broad views of dualism and their variants briefly in turn.

The legal incentives view

The legal incentives view holds that legal distortions introduced by the state result in persistent informality. The first variant emphasizes those distortions that restrain the entrepreneurial vitality of the informal sector and preclude it from growing, to the benefit of the large firms against which they would otherwise compete (de Soto 1989). The second emphasizes regulations that favor small firms at the expense of the large, but only on condition that the small stay small (Levy 2018).

De Soto and the other path

The Peruvian economy is marked by extremely high levels of informality. It is thus not surprising that one of the most interesting works on the subject in recent decades focused on Peru. Hernando de Soto's "The Other Path," which originally appeared in 1986, combined field study of the Peruvian informal sector and novel explanations revaluing its potential. Instead of seeing the informal sector as basically inert, little more than a pool of low-skilled labor, de Soto considered it full of entrepreneurial energy and native capacity. But the potential was unrealized because the state, at the behest of incumbent, mercantilist forces, imposed laws, regulations and administrative procedures that willfully ignored the distinctive reality of informality. Instead of recognizing and thus legitimizing the practices of the informal actors, the state decreed alien, "official" rules, whose inapplicability to the circumstances of informal actors put their sector outside the circle of legality and condemned it to low productivity (de Soto 1989).

De Soto's remedy is a system for the generation of norms and procedures that decentralizes and democratizes decision-making, making it responsive to informal-sector practices and ending the divorce between law and reality. By freeing the informal sector of the yoke of the state, the tremendous productive potential of the informal sector would be unleashed.

De Soto's view has the merit of underscoring the promise of the informal sector. But it is not clear that the informal sector is in fact limited by oppressive rules and laws, at least in Peru. Many of the inadequate (formal) norms and bureaucratic procedures to which it is subject are not in practice binding. Property is bought and sold problem-free without formal property titles, for which there are de facto substitutes. In addition, actors in the informal sector do not pay mortgages or most taxes, increasing their ability to accumulate family wealth. Together the limited reach of state law and the availability of workable, popular alternatives allow for the substantial accumulation of assets within informality.

Nor is the development of the informal sector limited only, or even most, by such burdensome regulation and red tape as may actually be applied. Many firms cannot comply with even reasonable standards and regulations. Field studies and trial policies inspired by some of de Soto's ideas have shown that even after substantial reductions in license costs or massive administrative simplification, informality has not been substantially reduced (de Andrade et al. 2013; de Mel et al. 2013; Jaramillo 2013).⁵ De Soto's postulates are now widely perceived as one-sided, at best.

Levy's under-rewarded efforts

Santiago Levy (2018) also invokes regulations, and distortionary legal obligations generally, as the most important explanation of the expansion of informality in Mexico. But he reverses the valence of the claim: small firms, not large ones are the beneficiaries of state intervention in his view.

According to Levy, the puzzle of relative employment growth in the low-productivity, informal sector is explained to a good extent by policy distortions (summarized in Table 7.9 in Levy 2018). Formal firms must pay for pension and health benefits, some of which (under universal insurance schemes) are provided to untaxed informal workers for free. In combination this implicit tax on formal employment and the corresponding implicit subsidy for informal employment bias the allocation of resources against the formal sector.⁶ His solution is straightforward: Eliminating all artificial obstacles, ranging from Social Security taxes to employment guarantees, and employment will allow high-productivity large firms to outcompete less efficient, smaller rivals, and assure the expansion of the formal sector at the expense of unsubsidized informality.

But Hsieh and Olken (2014), in a study of India, Indonesia and Mexico that reviews Levy's earlier work, find no meaningful discontinuities in firm size distribution in these

⁵ In Peru, for example, a hyper-simplified system, the RUS was introduced in 2004 and then changed to NRUS (Nuevo RUS) in 2017. It implied that micro and small enterprises paid a very small fee in lieu of all taxes. This made them formal, but only on paper. There is no evidence that being registered in RUS/NRUS changed their behavior in any meaningful way. It just resulted in agglomeration of income (due to under-reporting) around the thresholds. See Sunat 2018, p. 11-12.

⁶ Levy (2018) recognizes that the relative importance of each policy can't in effect be quantified.

countries. Most importantly firms do not bunch around the size thresholds where one would expect to find them in Mexico, following Levy, if owners were strategically limiting growth to avoid regulatory and tax burdens.

Furthermore, while Hsieh and Olken find some evidence consistent with the claim that large modern firms are constrained by taxes and regulations, they also observe that enforcement of the legal obligations is lax. Indeed, they cite Levy's (2008) finding that the vast majority of small and midsize firms in Mexico evade the 35 percent payroll tax. This is consistent, in their view "with the evidence that there is little meaningful discontinuity in the size distribution even at thresholds at which one would expect a discontinuity if taxes or regulations were perfectly enforced" (Hsieh and Olken 2014, p. 107).

In short, the tax and regulatory burden on large firms is unlikely to be the main explanation for the expansion of the informal sector even in Mexico, where that burden does exist in principle (though much less so in practice). The explanation is even less plausible as a general account of the phenomenon given that the Mexican legal regime is atypical, or at least distinctive, while the spread of the informal sector is widely observed.

The neo-dualist view

The conceptual alternative to de Soto and Levy is the neo-dualist view. It comes in two variants. In the structural variant, the informal economy, understood broadly as including stunted firms with low productivity and extremely limited possibilities for improvement, results from fixed features of technology or markets that keep micro or small firms from expanding. In the endowments variant, it is specific deficiencies in the makeup of informal-sector firms—a lack of managerial capacity or capital—that prevent them from taking advantage of existing opportunities.⁷ The two variants arrive at similar policy conclusions by different routes.

The structuralist (or poverty trap) variant

In the structural variant, set out in *Poor Economics* (Banerjee and Duflo 2011), near-subsistence firms and competitive or entrepreneurial firms with unlimited growth potential face different production functions.

For subsistence firms with a bare minimum of seed capital—enough to start a store at home by purchasing some shelves and stocking them with snacks—the returns on a small, marginal investment (for example, in a distinctive snack that draws a few new customers) are initially high. That explains why the store owner is able to pay high interest rates for credit. But returns quickly decline as the local market is saturated. A large investment—in expanded facilities, much more stock and so on—could succeed by attracting new customers and effectively expanding the market; but it requires capital that simply can't be accumulated by incremental steps from the starting point,

⁷ It is possible to translate from one dualist perspective to the other. Where firms have profound and pervasive deficiencies, we can say they face structural barriers for growth, and where their endowments are rich relative to needs, we can say they do not. But as the two vantage points direct attention to different research programs, it is useful to distinguish them for purposes of the later discussion.

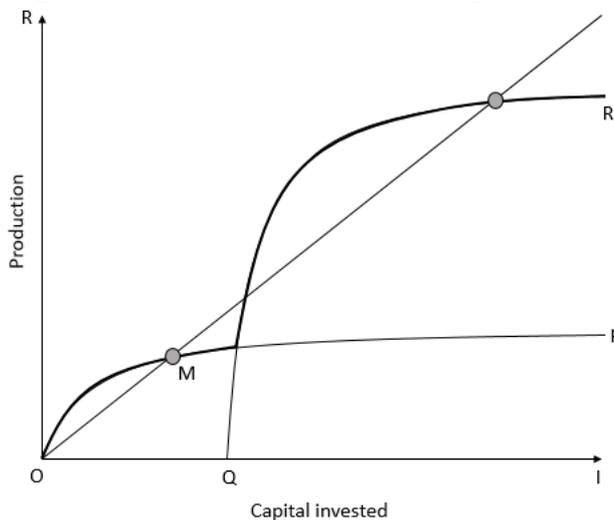
given the sharp drop in marginal returns as the business begins to expand after opening.

Competitive or entrepreneurial firms start with ample capital and face high, and perhaps even increasing returns to marginal investment. Their growth is limited, if at all, by the extent of the international markets in which they come to compete.

The two production functions can be combined into a single composite that shows the relationship between investment and output as capital outlays increase. This can be seen in Figure 1. OP represents the decreasing returns technology. QR represents the high-returns one. OR (bolded) is the composite of the two.

In this composite curve, the structural barrier to growth appears as a non-convexity: there is a range (at low levels of capital investment) where marginal returns are very low, and a range (at high capital investment levels) where returns are very high.

Figure 1: Composite Technologies



Source: Banerjee and Duflo 2011

The composite curve translates the structural barrier to growth—the gap between the subsistence and entrepreneurial firms—into a systematic disincentive for growth past a low limit for the small producer: the returns to the subsistence firm decrease just when they would have to sharply increase to permit accumulation of the capital needed to move to the high-return, entrepreneurial range.

The key point is that a rational actor, whose understanding of possibilities is fully reflected in the composite production function (with its non-convexities) will reasonably conclude that growth beyond a low limit (M) is impossible, and will put additional family savings, should there be any, to work outside the firm. Only very few people (and normally under very special conditions) are able to keep growing and accumulating.

To underscore the near impossibility of stepwise growth from the subsistence to the dynamic sector Banerjee and Duflo recount the nearly superhuman success of a Chinese entrepreneur. Recognized by her village for her intelligence, she was sent at an early age to a local school for fashion design, but then denied a promised job upon her return. Undaunted, she raised the capital to start a small garment factory by selling

sewing lessons to the women in the village and hiring the best students as her first employees. After a decade of continuing growth and re-investment the factory was big enough to compete successfully for contract work from international brands outsourcing to China. In a second, similar story an Indian entrepreneur realizes that she can increase her earnings by separating the bits of tungsten and other metals from the trash she and her husband collect and selling it pre-sorted to wholesalers; soon she and her husband have moved from trash collecting themselves to organizing the trash collection of others.

The point of these stories is that they are necessarily exceptional. The successful women are forces of nature, while most of us are not. The constraints they escape will bind almost all others. More fundamentally, these exceptional cases are self-limiting in another way: the increased earnings, which allow the subsistence firm to escape the low-yield trap in the production function arise from organizing other subsistence workers—in one case incorporating them as workers into a competitive-sector factory, in the other capturing part of the returns from marginal organizational improvement in subsistence work. Not everyone can organize others, so such strategies are inherently exceptional.

The endowments variant

The endowments view sees constraints on growth rooted in the resources available to the firm, not in the nature of markets and technologies per se.

For La Porta and Shleifer (2014), who explicitly reject explanations rooted in legal distortions, informal firms resemble formal firms in many ways. The skill levels of the workers in both are about the same, from which we can infer that the organizational and technological capacities are also similar, or at least could become so. The crucial difference as they see it is in managerial resources. The vast majority of informal entrepreneurs simply lack the skills to be successful in the formal modern sector. In support of this claim they point to two studies which find that the managers of informal firms are considerably less educated than those of formal firms (see La Porta and Shleifer 2008; Gennaioli et al. 2013). Since the highly educated are almost by definition scarce in developing countries, and will naturally be drawn to formal sector firms, where their abilities can be rewarded from the first, the informal sector is doomed to stagnation for want of managerial talent. And as in the Lewis model, it will disappear only when countries develop, and the modern sector grows and absorbs those workers previously employed in informal firms.

But notice that where the structural view sees fundamentally different types of firms (and technologies) in the informal and competitive or dynamic sector, the endowments view sees marginal differences: If the subsistence firm had somewhat better or more energetic management, or employees a greater range of occupational choices it would reach the high-returns range of the production function and growth would be self-sustaining or the workers could escape subsistence informality. If enough firms have such endowments, the structural barrier to growth vanishes.

Conversely, when the endowments are utterly inadequate the demands of the context—but only then—structural barriers become unreachable and the actors' rational response is to resign themselves to their fate. Kraay and McKenzie (2014)

refer to studies of unfortunate rural pastoralists in Kenya and Ethiopia to illustrate this limit case. Cattle raising is the only available economic activity, so the pastoralists have no choice but to tend their herds. Land near base camps is degraded, and will only support small herds. The water and forage needed to support larger herds can only be reached by risky migration. Only herds can bear the risk. The result is that small herds stay small—we are in the non-convex range of the production function again—while larger herds grow by investing. Note that this story of the trapped pastoralists is the mirror image of the accounts of superhuman entrepreneurs, and is supposed to be just as exceptional. Kraay and McKenzie assert that unlike the situation in rural Kenya and Ethiopia, in most of the world business owners can find alternatives if one line of business is blocked, and that “in practice, it seems individuals don’t need a lot of capital to start a business” (Kraay and McKenzie 2014, p. 139-40), suggesting that non-convexities are not typically a barrier to growth.

Given the distribution of endowments assumed in studies of the informal sector, however, the structuralist and the endowment views come implicitly to similar policy conclusions. The solution to informality for both is to create (well paying) formal jobs in the modern sector. As the formal sector grows, it sucks the employment out of the informal firms.

3. Some counter facts and an alternative hypothesis

In this part we look at the limits of the neo-dualist conclusions about the inert character of the informal sector. First, we canvas evidence that the capacity distribution of developing economy firms is at odds with neo-dualist claims; then we develop the concept of the quality hurdle to characterize the challenges faced by capable, small and mostly informal firms at the threshold of the dynamic economy.

The inconspicuous capabilities of the informal sector

Recent studies of structural change in Tanzania, microfinance in India and the persistence of the informal sector in Mexico find more continuity in the distribution of capacities than the theories just canvassed predict. *Nolens volens* these findings underscore an unsuspected potential for growth in the intermediate category of firms between the informal and formal sectors.

In a recent study of structural change in Tanzania, Ellis, McMillan and Silver (2018) emphasize that claims that the micro-, small-, and medium-enterprise (MSME) sector is unproductive miss the enormous heterogeneity among MSMEs. They recall that Lewis identified an “in-between sector” of firms neither completely formal and modern, nor informal and traditional, some with the potential to expand and modernize with economic development.⁸ They find “a surprisingly large number of firms” in what they call, accordingly, the in-between sector in Tanzania. Specifically, they write:

“There is a significant right-hand tail of firms in the MSME manufacturing sector whose productivity levels equal or exceed those in the formal manufacturing

⁸ The reference is to Lewis (1979).

sector. The total number of employees operating in the in-between sector in all activities falls slightly short of 1 million [out of 5.2 million (FSDT 2012, p. 82)]. These are the firms that are most likely to have the capability to grow into medium-scale manufacturing enterprises.” (p. 306)

Banerjee et. al (2017) also find that there is important and persistent heterogeneity in entrepreneurial ability. In a field study in Hyderabad, India, they distinguish “Gung-ho entrepreneurs” (GEs), who started a business before receiving microfinance credit, and “Reluctant Entrepreneurs” (REs), without such experience. They find that GEs benefit greatly from microfinance, increasing the scale and performance of their businesses: “self-employment hours increase almost 20 percent, the stock and flow of business assets increase by 35-40 percent, business expenses increase by 80 percent and revenues more than double, relative to REs in control.” The effect of microfinance on REs is insignificant.

How generally is this result to be interpreted? In the terms of Banerjee and Duflo’s earlier work, is it both that can-do entrepreneurs, because of their energy can overcome a non-convexity in the production function at the boundary between the formal and informal sectors, and that can-do entrepreneurs are relatively numerous? Or is it only that in Hyderabad (or in large Indian cities, or in developing country cities generally) there are more extraordinary or gung-ho entrepreneurs—closer in spirit to the Chinese superhero of the earlier story than the women she trained to sews—than we have been led to think? The more we know about the characteristics of gung-ho entrepreneurs the more we can generalize, or not, from their experience, But all we know from the study about the successful borrowers is that they had prior success in business. The instrument—having done well before or not—*is* the explanation. Banerjee and Duflo remark that “it does appear that there are indeed sizable benefits from microfinance, but it takes time for these benefits to accumulate. And it is important to look for the impacts in the right place”. We will take this as an acknowledgment that there are at least some broader possibilities for capability accumulation than their earlier study warranted.

Levy’s results for Mexico are also consistent with the existence of a very sizable share of in-between firms that, under the right conditions, can clear the quality hurdle and enter formal value chains. Levy studies those firms that survive between 2008 and 2013. He finds that surviving firms become more capital intensive: their stock of capital increases 16.4 percent while employment actually fell by 5.6. percent, and average size, measured by workers employed, fell from 4.5 to 4.3. He also finds that approximately one fifth of the low productivity firms registered in 2008 that survive for five years become high productivity in 2013; fully half of the survivors become medium productivity. In addition, approximately one quarter of the medium productivity firms of 2008 that survive for five years become high productivity in 2013 (Table 5.8 in Levy 2018). This result is also generally consistent with the Hsieh and Olken (2014) study, mentioned earlier, which likewise found continuity in firm size distribution in Mexico.

The discussion so far yields three stylized facts. First, there is a greater developmental potential, or more continuous distribution of capabilities in the informal sector, than current discussion allows. Second, there is little evidence that firms in the informal sector, despite capabilities in excess of the demands of subsistence, regularly enter

the dynamic sector, suggesting that their potential for development is still limited in some important way. Third, there is no reason to think the limits to development are fundamentally the result of legal obligations: informality in the sense of failure to comply with official requirements does not seem to penalize or privilege informal-sector firms in any determinative way.

In the next section we show that the existence of a quality hurdle—a bundle of technical and organizational capabilities that are the precondition to participation in the dynamic sector—reconciles these three stylized facts and suggests a re-interpretation of dualism that continues to see the dynamic, modern sector as distinct from the rest of the economy, yet under favorable conditions accessible to it.

The quality hurdle

Accounts of modern international supply chains emphasize their rigor. Buyers expect suppliers to produce goods that meet exacting specifications, free of defects, on precise schedules (just in time), while complying with (the more demanding of) national or international standards regarding the environment, labor conditions, and the rights of first peoples. Suppliers must meet all these requirements reliably, since delays or defects in production are enormously costly in supply chains that maintain minimal buffer inventories. Since standards continually ratchet upwards, suppliers must also be able to continuously improve their performance on all these dimensions. To qualify to compete for a place in an advanced supply chain, suppliers must meet all or most of these requirements—or demonstrate the capacity to meet them soon, for example by quickly identifying and correcting shortfalls. Once in a supply chain the supplier's performance is regularly rated. Persistent failure to keep pace results in exclusion. Domestic supply chains are less demanding, emphasizing reliability of supply over the constancy of quality and relaxing or eliminating requirements for continuous improvement, especially for new entrants. But these differences notwithstanding, participation in domestic supply chains, like participation in their international counterparts, demands a thoroughgoing and often wrenching break from habitual practices, including, especially, willingness and capacity to respond quickly and effectively to customers' complaints.

Participation in dynamic supply chains is also unquestionably rewarding: admission is a kind of certification of high-level capacity generally recognized in one's industry, and the continual review of performance under increasingly demanding conditions is an invaluable source of information about organizational and technical know-how. The very most successful suppliers can pass from continuously improving the production of, say, a complex component to co-designing the successor generation, or redeploying managerial and logistic expertise acquired in one line of activity to a related one, in a different market.

This combination of risks and rewards mean that the prospect of entering into a dynamic supply chain confronts the owner of a firm with an investment decision similar to, but even more daunting, than the decision faced by the owner of a small, informal-sector firm considering whether to marshal resources for a dash to the high-returns range of the production function. For the near subsistence owner, as Banerjee and Duflo make clear in their early work, the main, and indeed virtually the only, problem is financial: returns on the low-yield range of the curve simply don't accrue fast enough

to make a lumpy, high-return investment feasible, barring super-human or, as they later suggest, gung-ho efforts.⁹ The key point is that the small investor can, in some sense, buy the “expertise” for the high-returns endeavor—in the simplest case the additional shop inventory—more or less literally off-the-shelf.

At the entrance to dynamic supply chains financial resources are a necessary, but far from sufficient, condition for participation. The whole point of the elaborate qualification process, centered on review of the candidate’s product and process standards, and procedures for attaining them, as well as ongoing monitoring of suppliers’ performance, is to ensure not that an investment has been made but rather that it reliably yields the intended result. It is the firm’s capabilities, and above all its ability to develop and extend its capabilities that is, and continues to be, in question.

The potential investor understands all this and faces a choice, which, again, differs from that of the very small firm owner just above the subsistence line. In the near subsistence case, the choice is between (saving for) investment and consumption—living a little. At the boundary to the dynamic sector, the choice is likely to be among different alternative investments. Earnings from one firm could go to start another, in a wholly different domain—diversification. Or they might go into starting a new firm in the same line of business in a different location, perhaps with (another) family member or associate—horizontal expansion. Or they might go into upgrading the various capabilities of the existing firm in the ways needed to meet and keep step with the requirements of the dynamic sector.

In the near-subsistence case, where the financial constraint is dominant and all the information needed to calculate rates of return are captured in the non-convex production function, there is a single, rational answer to the question whether to invest or not. At the border between the static and the dynamic sector, there is not. The calculus of benefits depends on the particulars—often nearly imponderable—of the situation: Is now an opportune moment to diversify into real estate in this city? Is demand for my decent-quality replacement parts growing fast enough to support an expansion, or second location, of my machine shop? Will the domestic supermarket chain that wants me to become a regular and certified supplier help me solve technical difficulties if they arise? Do I need to free up money now for my children’s education? The rationally self-interested investment decision depends on the answers to these, and countless other, contextual questions.

But precisely because the decision to invest in upgrading to join a supply chain is only one choice among many, and often the most demanding and riskiest of all the competing possibilities, it is just at the point of that decision that we locate the boundary between the dynamic and the static sectors. Seen this way, the frontier is not between legal formality and informality: between firms that comply with all or most legal requirements and those that are not in compliance or don’t even bother trying to comply. Rather it is between firms mastering (and demonstrating continuing mastery) of the product and process standards required in the dynamic sector and firms that decide not attempt such mastery. Or made the attempt but failed.

⁹ Gung-ho entrepreneurs might succeed because of some combination of perseverance and unusual managerial or technical expertise, which would slightly complicate this picture; but Banerjee and Duflo ignore this possibility and here we do the same.

The existence of a quality hurdle would not only help explain why so few informal sector firms, despite possibilities for capacity building, enter the dynamic sector, but also why informal sector firms retain cost advantages in production that make it difficult for dynamic sector firms to outcompete them in low-quality, low-price goods. First, meeting the requirements of the quality hurdle is costly, at a guesstimate much more costly—and certainly more unforeseeably costly—than meeting the requirements of legal compliance. The necessary investments put a relatively high floor under the prices dynamic sector firms can charge, even with all their productivity advantages. Second and more subtly, some, perhaps many, of the informal-sector that end their upward capability trajectory just below the quality hurdle may thrive and perhaps expand as suppliers of good-enough (replacement) capital goods or support services to other informal sector firms. The productivity gains these firms do achieve would thus accrue to the benefit of the informal sector, making it more competitive with and resistant to invasion by the formal sector. The more pronounced the quality hurdle, the more stable, in the absence of policy interventions, the division between dynamic and static sectors. And the more persistently dualist an economy will appear.

To test these claims we would ideally examine the distribution of firms on both sides of the supposed capacity divide in various industries in countries such as Mexico and Peru, looking carefully at the reasons firms did and did not choose to clear the quality hurdle (and why they failed if they tried but did not succeed), and the role that reluctant firms, stopping short of the hurdle, play in sustaining the informal sector. That investigation would be complemented by enquiry into the kinds of support service that could make it more appealing for reluctant firms to take the risks of qualifying for participation in advanced production systems.

In this exploratory study we limit ourselves to presenting, next, a sketch of quality hurdles facing small producers of fresh produce in Peru. We focus on small farmers because they are numerous and at risk: Their possibilities for finding productive, alternative employment in manufacturing (or elsewhere) are extremely limited. Understanding whether and, if so, how they can augment their capacities and connect to the dynamic sector is therefore of central importance to articulating new models of development.

We focus on Peru because it could be an important test bed for such a model. An export boom in fresh fruits and vegetables is already underway. So far it has been centered on large, vertically-integrated producers, which grow and process their own crops. But further expansion of the export sector will depend on incorporating the country's smallholders, many of whose families acquired titles to small parcels of land (5 hectares or less) after the dissolution of cooperatives formed as part of General Velasco's agrarian reform 50 years ago. Since then these small producers have been abandoned by the state.

Understanding how small producers, typically in association with each other and with the support of their (relatively small) customers, have been able to clear the quality hurdle in the absence of public support will help orient discussion of public policies that broadly encourage this kind of capacity building in the many cases where private interests do not happen to align to favor it.

Our method of studying small Peruvian produce farmers is now called economics by walking around: talking to the key actors, in this case the small farmers and exporters and supermarkets that buy their produce. As we are interested in strategic choices shaping the market at the entries to the dynamic sector, we spoke with both the managers of supply chains, including especially those whose day-to-day responsibilities keep them in constant contact with their suppliers, and with some of those suppliers themselves. Often, we spoke with small groups of both together about their experience and plans. In addition, we spoke with managers of cooperatives producing cacao, coffee and bananas. Although their cooperatives operate in distinct market segments and export directly, the problems these managers face in helping their small members meet and maintain high quality standards are strikingly similar to those encountered by managers in midsize exporters' supply chains. We report only findings that were fully consensual—shared by both buyers and sellers in each conversation and across all conversations with actors in similar relations—and with the cooperative managers where relevant. In a loose sense then we are presenting the heuristics or rules of decision-making and organizational design applied by each side of the market and agreeable to the other.

Our findings agree with those of the literature on the participation of small producers in developing countries in global and domestic supply chains; we find some comfort in this agreement for the generalizability of the results.

4. Quality hurdles in the Peruvian agricultural sector

Perishables—fresh produce generally—are gaining weight in consumption baskets worldwide, in middle-income developing countries and advanced economies alike. Consumer tastes are changing, turning against processed foods produced by “industrial” methods and in favor of more “natural” products such as fresh fruits and vegetables, ideally sourced locally (or from a known producer) and free of dangerous chemical residues, if not “organic” by one of the many competing definitions.¹⁰

The appeal of fresh, natural products is further evident in efforts to make frozen fruits and vegetables fresher and more natural, with corresponding pressure on the standards applied to farmers and the rest of the supply chain. Exports of fresh, frozen and conserved products originate in the same fields; but the produce that does not meet the consumers' size or cosmetic requirements is processed.

The spread of e-commerce, furthermore, means that many shoppers buy staples online. Supermarkets in middle-income and advanced economies are increasingly forced to rely on attractive offerings of fresh produce and other short-lived and wholesome products to draw consumers into their stores. Recognizing the need for a reliable supply of high-quality fresh produce the most forward-looking supermarket chains are establishing dedicated teams to help wholesalers close to farming communities build the capacity of their local supply networks among small producers.

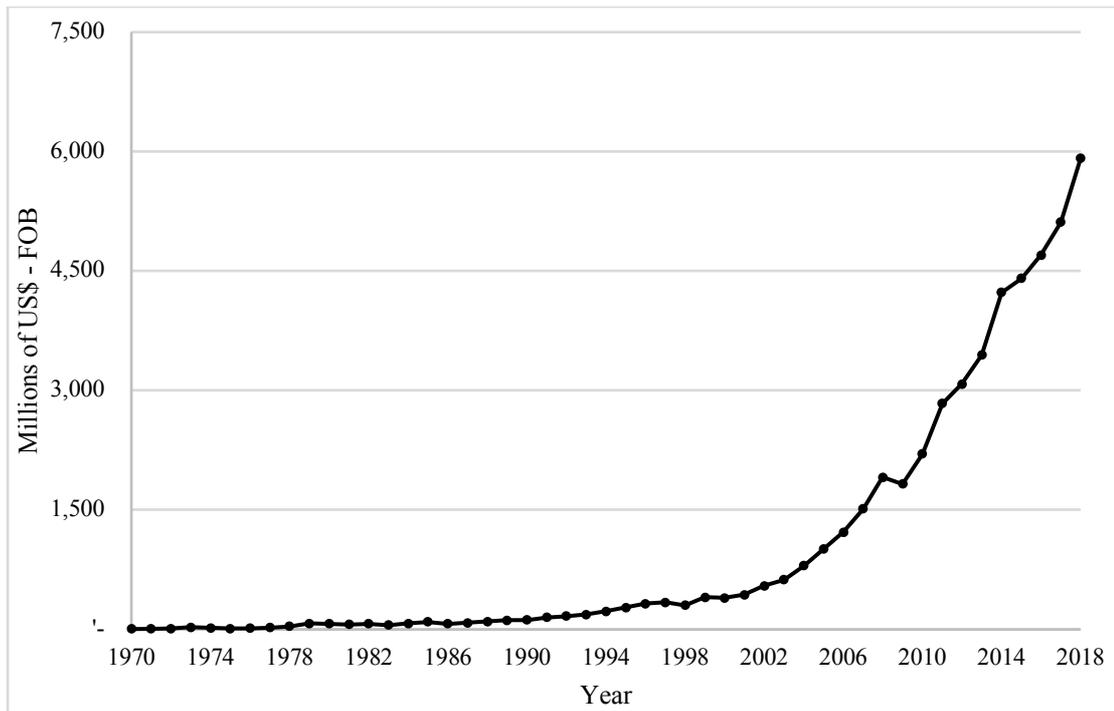
¹⁰ For further discussion on the development of quality standards in the dairy industry, see Sabel et al. 2015.

All these changes have both spurred and been encouraged by the spread of public and private quality standards in food. The rapid increase in public food standards can be gauged by the exponential multiplication of notifications of new sanitary and phytosanitary regulatory measures to the WTO, from a few hundred in the mid-1990s to more than 15,000 to above 20,000 in 2017 (Swinnen 2018, p. 170).; the growing importance of (more demanding) private standards is reflected in the increase in GlobalG.A.P.-certified producers from around 20,000 in the mid-1990s (Maertens and Swinnen 2015, cited in Swinnen 2014) to around 200,000 in 2018 (GlobalG.A.P. 2018, p. 32). Growth in agricultural exports in these years has, moreover, been greatest in the higher value products—fruits, vegetables, seafood, fish, meat and dairy products—where standards are most important; the shift to such exports has been most marked in developing economies in Asia and Latin America (where the share of high-value added products in agricultural exports doubled from around 20 percent in 1980 to 40 percent in 2010), with similar, but slower changes in African economies (Maertens and Swinnen 2015, cited in Swinnen 2014). With these economies a “supermarket revolution,” led by international and foreign investors, has led to concentration in the food retail sector and application of standards to a growing share of products intended solely for the domestic market (Dries et al., 2004; Reardon et al., 2003; cited in Swinnen 2014).

Against this backdrop, Peru has in recent decades become a leading exporter of fresh fruits and vegetables. In products like avocados, artichokes, asparagus, blueberries, grapes, or mangos ranks among the 5 biggest exporters in the world; in many of these categories among the top 3. Exports of these agricultural products have increased since the beginning of the century, from USD400 million to 6 billion last year, with expectations of continued growth.¹¹ (See Figure 2)

Figure 2: Peruvian Agricultural exports

¹¹ Strictly speaking, we are showing what in Peru are called “non-traditional” agricultural exports. They refer to new agricultural exports (like fresh produce) and are defined in opposition to traditional agricultural exports (like cotton, sugar and coffee) that Perú was already exporting in the 1970s (or earlier). From those traditional export products, only coffee is still exported.



Source: Central Reserve Bank of Peru 2019. Authors' own elaboration.

This expansion drew on Peru's locational advantages, such as a stable climate with ample sunshine, the cooling effect of the Humboldt Current, and counter-seasonal growing patterns opportune for supplying Northern Hemisphere markets, along with its large endowment of relatively inexpensive labor and energy.¹² But the boom would not have been possible without important policy interventions: Several large irrigation projects (particularly Chavimochic I and II) increased the supply of arable land. Peru entered 15 free trade agreements (or similar) since 2006, with countries like the US, China and the EU, removing tariff barriers to exports. It also augmented the capacities of its phytosanitary authority, SENASA, so that its agricultural products meet the demanding regulatory requirements of its trade partners. A Law on Agrarian Promotion (Number 27630), approved in 2000, allows short-term labor contracts in agriculture. Labor market flexibility is especially important for Peruvian exports of fruits and vegetables because, unlike the highly mechanized production of cereals in Brazil, Argentina and the US, the sector is very labor intensive, and employment is highly seasonal, increasing severalfold at harvest times.¹³

The largest exporters of fruits and vegetables, which together supply about 70 percent of the exports market, are highly sophisticated, and mostly vertically integrated firms.

¹² Ardilla et. al. (forthcoming) emphasize the role of trade liberalization, the rise of supermarkets, and breakthroughs in cold transport technology in increasing the share of imports in fresh fruits sold retail in the US from 23 percent in 1975 to 53 percent by 2016, with 90 percent of the imports sourced from Latin America.

¹³ There are no exact calculations. As a rule of thumb there is, during high season, at least one worker per hectare. This is sixty times more labor intensive than Brazil's soy production, which requires 0.017 workers per hectare (see Bustos et.al. 2016). In some provinces of the Ica and La Libertad regions, the two main centers of Peruvian modern agriculture, unemployment is virtually zero. They employ migrant workers from the Andean provinces migrate during harvesting season.

They sell directly to global brands; some are recognized as exemplary producers in extremely demanding supply chains, such as Walmart's. They produce most, and in many cases all, of what they export on their own land.¹⁴ The largest of them have estates of several thousand hectares in the coast. They focus on capital-intensive crops like blueberries, where the cost of soil preparations is the greatest. In response to market opportunities they may buy produce from smaller farmers. But with few exceptions they do not systematically build their own supply chains with small producers; and their substantial R&D capacities are directed towards improving cultivation and processing of the crops on their own land, or entering new markets, not supporting suppliers.

With much less capital at their disposal than the largest exporters, the midsize producers and packing operators are highly reliant on outside suppliers. These firms normally grow some of their inputs themselves; but well over half their needs, and usually more, are met by purchases from small farmers. Given the rising costs of land and the difficulties of acquiring easily managed, contiguous plots, growth in this segment of the market will depend almost entirely on increasing outside supply.

Though the midsize producers do not sell directly to global brands, their products must meet essentially similar standards regarding regularity of size, shape and color, exposure to pesticides (and, of course, presence of pesticide residues), control of prohibited agrochemicals, maintenance of buffer zones at the margins of fields, respect for authorized crop rotations for particular cultivars, and so on.

Small producers outside the dynamic sector cannot begin to satisfy these requirements on their own. Helping them do so, and carefully monitoring that they in fact do—helping them, in other words, clear the quality hurdle—increasingly makes close and continuing collaboration between the buyer-processor and the small farmer supplier indispensable to growth for all but the very largest exporters.

These pressures for collaboration are inducing ambitious midsize producers such as Cuyuma and Asociacion de Productores de Espárragos Compositan to both increase technical support for and monitoring of their small suppliers. At the heart of the emerging relation is an exchange: Buyers provide the supplier with funding, seeds, and continuous technical assistance. In many cases such supervision and support are nearly continuous, entailing daily visits, if only to permit immediate detection of the use of impermissible chemicals to protect crops or accelerate their growth. In return for providing these inputs and services at below market cost the supplier gives the buyer the right of first refusal when the crop is sold. This affords the buyer with a reliable source of supply at the requisite quality level, without tying either party into a long-term commitment to a fixed price.

Where possible, the midsize producers prefer to buy from smallholders who are members of an association or cooperative. As association ties the good of each to the

¹⁴ Among 5 of the top largest exporters (Camposol, Beta, Talsa, Danper and SAVSA), the percentage of raw materials sourced from own funds for fresh produce is close to 100%, with the exception of DanPer. The percentage falls significantly for frozen and conserved fruit for the cases of DanPer and Savsa as the raw material utilized for those is normally produce that fails to meet size or cosmetic requirements to be sold fresh. In those cases a large percentage can be supplied by other producers (including smaller ones).

good of all in the same group it naturally encourages the small farmers to teach and learn from each other, cutting the total cost of continuously educating the individual members of the association in good practices, and reducing in equal measure the costs of support born by the buyer. Collaboration among the farmers lowers the costs of learning good practices, monitoring their application, and introducing new varieties. Cuyuma, for example, tries to establish relations with associations and cooperatives as they form, to benefit from these cost reductions as quickly as possible and to shape the group's practices to its needs. Looking ahead, it contemplates establishing experimental plots to test new field treatments and new cultivars jointly with these partners.

Besides the midsize exporters, the other growing and quality-conscious purchaser of fresh produce in the Peruvian market are the domestic supermarket chains. The three large chains together account for about 20 percent of Peruvian consumption of perishables. They impose on domestic perishable suppliers' requirements that are normally higher than those of traditional *mercados*—which compete on price and seldom make representations concerning provenance or quality—but appreciably lower than those of the exporters. The supermarkets insist, for example, that producers build staging areas close to the fields, with paved floors, roofs, changing areas and bathrooms so that crops can be protected against contamination from the field that farm hands can maintain sanitary conditions. Likewise, there is attention to pest control and basic record keeping, for instance in annual review of a simplified version of the field register used by the exporters in conformity with international standards. Thus, small producers supplying this segment might be said to be clearing the quality hurdle, with one foot still in the traditional sector and the other in the air, pointed towards, but not yet planted in the dynamic one.

But even this halfway result requires substantial exertion. To sell to supermarkets, small producers must assure the reliability of supply. It is easier to do this if they pool the risks of shortfalls by forming associations (in some cases *de facto*), which have the additional advantages of reducing learning and monitoring costs for members and customers. Despite the lesser requirements, therefore, here as well efficiency considerations encourage cooperation, though its scope and ambitions are more limited in this setting. But the smaller investment notwithstanding, in this case also customers preferred to free ride on promising efforts at self-organization, and to work with nascent but already functioning associations rather than running the economic and, above all, reputational risks of being involved with, and perhaps accused of responsibility for failure of an initiative likely to enjoy popular sympathy.

These findings were corroborated and extended in discussion with the managers of cooperatives. Helping members and potential members to meet standards—again, to clear the quality hurdle—proves paramount to their responsibilities. Yet asked directly what makes a cooperative succeed the managers say, unanimously, trust, meaning roughly that each member shares a commitment to the common purpose and will subordinate self-interest to it. Only when asked to explain the process by which new members are admitted, and existing ones evaluated and, if need be, sanctioned or assisted, do the managers focus on meeting standards and developing the capacity for continuous improvement.

An initial discriminator in the assessment of applicants for membership is a producer's response to criticisms of product quality. Some react angrily or dismissively, saying that the fault lies with the standard or the evaluator, and they or following methods proven through generations. Those more apt to become capable members want to understand what went wrong and how they can improve. But even in the case of those determined to improve, it can take two or so years to establish their capacity to actually do so, with the support of the association or cooperative; and once established capacities must be renewed and extended to keep pace with increasing quality requirements. This experience is reflected in the cooperatives' careful qualifications for membership, and preference for long trial periods for candidate members, as well as continuing evaluation and support for those that do qualify. One well-run cooperative, for example, imposes minimum quality and productivity requirements for candidate members; observes the candidates' performance, and especially their ability to improve with support, for two years before deciding on membership; and ranks all members into three categories by their performance, with those in the middle group receiving support targeted to their specific problems, and those in the low-performing group eventually excluded from the coop if they persistently fail to improve.

Contracting in differentiated agricultural markets

Our observations are supported by the findings of a substantial body of literature on deep changes in agriculture and the development of supply chains in advanced and developing economies. In economics textbooks agriculture is still presented as a classic example of spot markets, in which numerous buyers and seller, all price takers, transact for standard products, or commodities, with all information relevant to exchange fully shared. Today in fact spot markets in agriculture are the exception, not the rule. Concentration among wholesalers and retailers means that in many geographically bounded markets many farmer producers sell to a few, oligopsonist buyers. Products, even once archetypical commodities such as wheat, are differentiated by quality (including aspects of quality, such as environmental sustainability or the labor conditions of production, which are not apparent to inspection) and by the timeliness and reliability of delivery. Because products are differentiated pertinent information will be costly to acquire and more accessible to some traders than others, not generally available in the market.

When many sellers face few buyers a normal result is oligopsony: price fixing to the advantage of buyers over sellers and consumers. But in modern, differentiated agricultural markets the supply of inputs to intermediaries and the demand for the resulting products are insensitive to price changes or inelastic; matching supply to demand when price changes do not requires deliberate coordination, constraining the oligopsonists' behavior and favoring the development of the kinds of supply chains we have been discussing.¹⁵

On the supply side, farmers in differentiated markets can't be expected to come equipped to meet the requirements of particular customers. Learning to do so requires an investment; since the supplier's investment is, by definition, specific to a particular customer, for whom alone it has value, it is the customer—the intermediary—who has to bear the cost. The customer likewise bears the cost of monitoring the execution of

¹⁵ This discussion follows the analysis in Sexton 2012 and Swinnen et al. 2015.

contracts linking adherence to the new, specialized methods and the acceptability of the final product. Together these expenses mean that the costs of switching suppliers—qualifying a new farmer-supplier to replace a current one—are high relative to the costs of managing and extending relations with demonstrably capable and dependable providers. The costs of disruption are increased by constraints imposed, on the demand side, by the intermediaries' customers, such as supermarkets. For these buyers, as we saw, reliability of supply is paramount. A missed delivery causes immediate damages in foregone sales and may raise longer-term questions about reputation; so great is the potential harm that the penalty for unreliability is typically exclusion from the supply chain. (Note that delivery failures in one period can't be compensated by price reductions and the prospect of increased sales in the next because processing and logistics concerns—starting with shelf space—limit the buyer's ability to to expand sales of a particular produce at a discount in the short run.) Together the supply- and demand-side constraints induce a shift from spot markets to vertical coordination of supply chains for differentiated goods through contracts linking production methods to product definition. In the US such "interlinked" contracts covered 11 percent of the total value of domestic agricultural production in 1969, increased to 28 percent in 1991 and then 39 percent in 2008 (MacDonald and Korb 2011, cited in Sexton 2012).

These constraints are even more binding in developing economies with weak institutional environments, subject to an important proviso. In developing economies potential, small farmer-suppliers, facing as we saw the quality hurdle, are likely to lack experience with quality control and other basics of participation in the dynamic economy in addition to capacities specific to a particular customer. This increases the costs, but also the risks of investment to the buyer: since the basic capacities, once acquired, can be redeployed in relations with other customers, the buyer must be on guard against the supplier's possible opportunism. The same goes for monitoring. In a weak institutional environment, where contract enforcement is unlikely, monitoring will have to be intensified as a partial substitute for missing legal incentives to respect contract terms. But it will be difficult to separate monitoring for compliance from monitoring as part and parcel of teaching basic skills; so more monitoring may also increase the chances that the supplier breaches the contract for another, more favorable one, or threatens to do so unless the current customer offers better terms. Together these considerations move the buyer to offer the supplier an "efficiency bonus" or premium to the market price as an incentive to overcome the temptations of opportunism. Thus, despite the power imbalance between buyer and supplier, the constraints of differentiated markets, especially in developing economies, lead the buyer to support leaning by the supplier with the aim of establishing long-term relations (Swinnen 2014).

But precisely because these constraints are so binding buyers will seek to avoid these governance arrangements when then can. This is the proviso. In differentiated markets, where quality and thus the quality hurdle matter, buyers will support training and long-term relations with small producers only if the limited supply of affordable land makes vertical integration impossible and even then only if large suppliers cannot meet demand, in that order of preference. We saw one indication of this in the preference of large, Peruvian exporters—early entrants in the boom—for vertical integration. The rank order of preferences is clearly documented in a careful study of the effects of certification—especially product certification, covering growing

conditions of the product on the farm—on the sourcing strategies of Peruvian asparagus exporters. At the start of the study period in 1993 purchased just over half of their inputs from outside farms of all sizes and 15 percent of their total demand from smallholders with 10 or less hectares of land. By the end of the study period in 2011, after the spread of the demanding GlobalG.A.P. standard, all lurches from outside farms had decreased by 37 percent, and purchases from smallholders by just under three quarters. Underscoring the importance of quality, non-certified companies continue to source from smallholders (Schuster and Maertens 2013).

But where some combination of circumstances limits exporters' ownership of plantations or access to large suppliers small producers are successfully included in supply chains for high-value-added products. A recent survey of the literature (Swinnen 2014, p. 3) includes dairy production in Bulgaria and other examples from Eastern Europe (Dries and Swinnen, 2004; Noev et al., 2009; Van Herck and Swinnen 2014); the vegetable export sector in Madagascar (which consists only of smallholders, some 10,000 of them) and the fruit and vegetable sectors in Zimbabwe (Henson et al. 2005), Chile (Handschuch et al. 2013) and Thailand (Kersting and Wollni, 2012). In China the horticulture export sector is based almost completely on smallholders producing under contract (Wang et al. 2009); smallholders also predominate in similar supply chains in many other Asian countries (Gulati et al. 2007). *Ceteris paribus* the results we found in Peru are typical, not exceptional.

To look beyond the question of whether smallholders can participate in advanced supply chains to the question of factors that encourage participation when it is possible we turn finally to a study of small suppliers to Nairobi supermarkets (Andersson 2015). Unlike the supermarket chains in Peru these buyers provide no assistance to potential suppliers; indeed, they require—again unlike their Peruvian counterparts—that the growers clean produce themselves and deliver it to the customer's stores in Nairobi. The result is to make mutual support among the producers and above all outside training in quality standards and other assistance if anything more important than in Peru.

The study focused on farmers with one or two acres of land selling produce under verbal, and sometimes written agreements to supermarkets or, alternatively, to traditional markets, with significant switching between these retail channels over the course of the investigation from 2008 to 2012. Farmers supplying supermarkets were (in common with studies of this kind) better educated and had slightly better endowment of capital, including vehicles, and greater possibilities of off-farm employment. Their earnings per capita were on average twice those of farmers supplying traditional markets. The first, statistically robust finding is that association—a capacity for mutual support termed “social capital”—is that social capital matters participation in demanding value chains (though the study does not discuss the actual forms of cooperation). A farmer's social capital is measured by the number of her five geographically nearest neighbors who also supply high-value added customers.¹⁶ At the start of the study farmers supplying supermarkets had just under three nearest neighbors also supplying channel, while suppliers to traditional markets had about

¹⁶ Since supermarkets demand that farmers deliver produce to their stores they are indifferent to suppliers' location and clustering does not reflect their preferences. To control for the possibility that clustering and the decision to supply supermarkets reflect the influence of a common, unobserved variable the study instrumented neighbor characteristics.

one. The second finding is that, in the absence of support from the supermarkets or the state, support by an NGO was critical. An international NGO was active in the area before the start of the study; it trained farmers in the production techniques needed to meet the supermarkets' requirements for quality, consistency and post-harvest treatment of vegetables; coached them in collective approaches to marketing and negotiated with buyers on their behalf.¹⁷ Equally important the NGO operated a factoring or invoice discounting service, anticipating payment to farmers upon presentation of delivery receipt and then collecting the debt from the supermarket. This allowed relatively poor farmers to sell to supermarkets despite lagged payments. The influence of the NGO was most clearly revealed by its absence. During the study period the NGO wound down local operations; its withdrawal was an important factor in the decision of half the farmers selling to supermarkets to switch back to traditional markets, despite the considerable loss of income (Rao and Qaim 2010).

Even our preliminary investigation, together with this study of the Nairobi supermarket supply chain, make clear that capacities have been built whenever there are fortunate accidents: when groups of cultivators bound by ties of proximity, kinship or politics encountered exporters or supermarkets in search of reliable supply and willing to invest in collaboration to a degree determined by their quality demands. Conversely there is no reason to think private investment in capability building was optimal (so that all who can acquire capacities at roughly the current price already have done it), or that the existing supply of capacities happened to support the production of just the amount of higher quality produce that can be marketed domestically or exported, the story would have no implication for policy. But neither condition is true. It would be a fortunate accident indeed if all the accidental encounters together touched the farmers, and only the farmers, who could benefit from them. It seems more plausible to assume that the outcome of the accidental encounters reveals a broad diffusion of capacity and will. Nor is there reason to think Peruvian agricultural exports, or the share of quality products in domestic consumption of foodstuffs, have reached efficient, natural limits. The growth rates in exports of perishables suggest that an increase in capacities is likely to lead to increasing sales abroad, not a glut on the domestic market. Hence if there was public support for extension services, in combination with complementary support for association to help socialize the costs of learning, we should expect a substantial increase in the numbers of small producers clearing the quality hurdle to enter the dynamic sector. This is clearly an attractive prospect given the exhaustion of the industrial model of structural change, and all the more so to the extent the policy lessons learned in agriculture eventually prove applicable to capacity building in services or small-scale manufacturing such as shoes or garments.

In the world at large the institutional means and governance principles for providing extension services and support for association to small producers are common, if not commonplace. But in the discussion and practice of development it seems that these tasks assume capacities for constant adjustment to new and varied circumstances that states in developing countries—perhaps states generally—don't have. We can't fully reconcile these divergent perspectives here; but calling attention to them may help reduce the chances that development economics, by its intellectual legacy and institutional reflexes, overlooks or despairs of realizing solutions to the new demands

¹⁷ See Rao and Qaim 2010 for further discussion.

of policy that are hidden in plain sight. In the concluding part, therefore, we characterize those demands and state briefly why under current conditions they can be met. Then we prophylactically recall a classic discussion in development economics that begins—50 years ago—with Albert Hirschman’s provocative reaction to the confounding effects of uncertainty on project management only to conclude recently that development institutions’ ability to manage uncertainty is in fact restricted by the cultures they themselves have created, not by any inherent limit in what institutions can do. We understand that this discussion cannot be a substitute for a more thoroughgoing elaboration of the kinds of institutions and incentives that are actually needed to serve small producers. Doing so for a country like Peru is a task in itself, to which we aim to turn in our next round of work.

5. Managing uncertainty

Capacity-building extension services must be customized to the context of application to be effective. Even when seeds are standardized regionally or nationally, soil improvement, application of fertilizer and pest control have to be adjusted to the particularities of each locale, and ultimately to each farm, to increase productivity while minimizing the use of expensive agrochemicals that often endanger human health or the environment. Support for association likewise depends on solving highly idiosyncratic, place-specific problems: managerial breakdowns or skill gaps within a cooperative or association; coordination failures of associated producers and their customers or supplier, and so on.

Another way to put the point is to say that providers of these services face two kinds of uncertainty. The first is uncertainty about extension of the frontier of technological capabilities: mastering techniques that are wholly novel or so new to a given locale that they must almost be reinvented to be mastered. In agriculture the paradigmatic example is the introduction of a new crop variety to a region. The second is uncertainty arising from novel combinations of familiar interventions in a particular place. A paradigmatic case in agriculture is control of non-point source pollution: the contaminants that run off a field after a heavy rain. Because of variations in the pitch and absorptive capacity of the soil, as well as seasonal differences in rain fall and crop cycles, an ensemble of measures—fertilizer applications, creation of buffer zones—that work well in some places will typically be ineffective in others. A convenient name for policies that, encountering such uncertainty, have local adjustment as the precondition of success is place based (Rodrik and Sabel, forthcoming).

Uncertainty of these types is now pervasive, and broadly recognized as a condition of economic and political life in advanced and developing countries alike. The organizational or managerial response to such uncertainty, and with it the demands of place-based policy, is likewise widely acknowledged: Plans under uncertainty are necessarily preliminary. An indispensable means of correcting them in the light of experience is by continuous exchanges between those at ground level with immediate knowledge of unforeseen problems and possibilities and those with a more comprehensive view of comparable situations and problems, with each level correcting the other in a continuing cycle that modifies methods and goals. As arrangements of this kind have spread traditional, closed hierarchies are giving way a post-bureaucratic form of organization where no level is unequivocally “superior” to

the others, and where insiders can collaborate with outsiders across porous institutional boundaries. Variants of such organization are familiar in advanced manufacturing and precision agriculture as well as in public-sector programs supporting innovation at the frontier of science and technology and in the contextual control of non-point source pollution—the domains we just used to illustrate the kinds of uncertainty associated with place-based service provision. Seen this way the principles of place-based governance have already been invented and their feasibility demonstrated. The task—not trivial, but surely not insurmountable—is applying them to the new demands of developing countries such as Peru.

But from the perspective of development economics and development practitioners managing place-based uncertainty long seemed an impossible task, and as a practical matter in crucial ways continues to be. Deep and long-standing perplexity about how to respond to this challenge has slowly, and belatedly, given way to the recognition that response is theoretically possible—but also that, in the meantime, the organization structures and cultures of leading development institutions have hardened in a way that limits renovation and perpetuates the original incapacity despite awareness of better alternatives. Just as the structural model of development and the dualist theories derived from it obstruct the view of new actors approaching the quality hurdle, so this legacy of institutional self limitation and the culture of caution to which it helped give rise obstruct appreciation and adaptive emulation of the principles and practices that could guide policies supporting them.

To grasp the daunting shadow of uncertainty on institutional imagination and daring in development economics and practice we look briefly at the publication and reception of Albert O. Hirschman's *Development Projects Observed*. The book, the fruit of a year's study of World Bank development projects, is an extended reflection on the perturbing effects of uncertainty: "the element of the unknown . . . and the unexpected which deflects projects from the originally chartered course." The story of a paper mill in East Pakistan provided a striking illustration (Hirschman 2014, p. 8-9). The mill machinery, produced in Sweden, was designed to process pine; in East Pakistan it processed bamboo, whose unexpectedly high silica content crippled operations for years. After the teething problems were overcome production was interrupted for a time by the flowering and death of the surrounding bamboo forest—an occurrence wholly new to local silviculture, later calculated to repeat every 50 or 70 years. Every project was in some measure uncertain, Hirschman found, because in each the interplay of internal characteristics with the immediate environment produces "a unique constellation of experiences and consequences, of direct and indirect effects" (Hirschman 1967, p. 186, emphasis in the original).

Hirschman suggested contradictory responses to this uncertainty. The first was a typology of projects, ranked by degree of uncertainty. Those "particularly marked by technological uncertainty and ignorance" were the ones "enmeshed with the natural resources of their respective countries" (Hirschman 2014, p. 38): in the terms introduced a moment ago, place-based projects subject to the uncertainties of frontier knowledge and context. In these cases, Hirschman thought implementation was the wrong term for the execution of such projects as it suggested fidelity to a workable plan. In fact, in these cases the actors embarked on a "voyage of discovery" in which general scientific and engineering knowledge was adapted to the precise

understanding of local resources developed under the projects' auspices (Hirschman 2014, p. 38).

At the opposite, low-uncertainty position in the typology were infrastructure projects, in domains such as telecommunications or electric power generation, which “touch a country’s terrain only lightly” (Hirschman 2014, p. 38). In such cases foreign technology can reliably be applied with minor or no adjustment. Within this type Hirschman further differentiated variants according to whether residual sources of uncertainty came from surprises in supply or demand, or in the extent of the “latitude” projects and the agencies supervising them created for corruption (Hirschman 2014, p. 99-102). The implication was that these considerations should bear on project selection and management.

The second, alternative response was more speculative. Hirschman conjectured that planners and managers, because of misplaced faith in their own abilities and over confidence in the reliability of “comprehensive,” ex ante risk assessments, underestimated the difficulties that would actually face in undertaking a project; but thanks to a providential “hiding hand,” they also underestimated, and to the same degree, the ingenuity that adversity calls forth, allowing them to realize their purpose despite their miscalculations (Hirschman 2014, p. 20-26; p. 8-31). The existence of this supposed mechanism would counsel against close consideration of the uncertainties of various types of projects. An actor that correctly assessed the potential for disastrous surprise, but not the offsetting, innovative stimulus of adversity, would abandon a project that a less scrupulous colleague would successfully complete. Short of complete knowledge, ignorance was bliss.

Neither suggestion interested Hirschman’s World Bank sponsors. They had expected—and would soon get from many other quarters—help in improving cost-benefit analysis and other tools of ex ante evaluation: precisely the “comprehensive” approach to project planning that Hirschman explicitly rejected. His work was dismissed not as wrong, but as useless, in that it provided practitioners with no help in the day-to-day management of uncertainty beyond the informal accommodations they had already hit upon (Aleceovich 2014, p. 163). In the preface to a new edition of *Development Projects Observed* in 1994 Hirschman recognized that the principal of the hiding hand had been “close to a provocation,” but offered no further thought on how uncertainty was to be managed, as opposed to avoided by identification of especially hazardous project types, or imagined way by invocation of a providential mechanism (Hirschman 2014, p. xvii).

Times have changed, and yet not. In a recent book, co-sponsored by the Independent Evaluation Group of the World Bank, development practitioners reflecting on Hirschman’s work take for granted that uncertainty can be actively managed through some adaptive process in which ends and means are adjusted as new information comes to light. But discussion of alternative forms of project selection and management embodying this idea is suffocated by the simultaneous recognition of organizational obstacles to putting such methods into practice. The World Bank, for example, is said to recruit macro-economists, “whose training predisposes them towards prescriptive rather than exploratory approaches to development,” and whose “preponderance in mid-level management then creates a culture in which greater adaptiveness is seen as a threat to project quality.” (Meldolesi and Stame 2019, p.

99). In crucial ways, and at least in some key institutions, the current cohort of reformers in development policy, and the ideas they reflect seem as marginal as Hirschman himself came to be. Even if their explanation of the causes of rigidity is incomplete, their very isolation attests to the limit of the diffusion of the new governance concepts.

But put the other way around this discussion by its very assumption of organizational alternatives, reinforces the fundamental point: the general institutional designs and governance practices needed for place-based policy already exist. Even if they seem exotic or utopian inside the world of development economics they are not a rarity outside; and the rest of us don't need to invent them because they already have been. The task now is to adapt those designs and practices to the new needs of development—to support capacity building by new actors at the portals to the dynamic sector, outside of traditional industry.

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