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Poinsettia Assembly and Selling Emotion: High Value Agricultural Exports in Ethiopia

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Poinsettia Assembly and Selling Emotion: High Value Agricultural Exports in Ethiopia

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Abstract

We examine how investment in high-value agriculture can help to address the balance of payments constraint on growth and the wage employment challenge in Ethiopia while accelerating structural change. The industrialization of freshness has significant implications for policy priorities.

Development cannot be sustainable without structural change, in Arthur Lewis's sense of a shift of people out of low and into progressively higher productivity economic activities. This process has often been (mis)understood as a rural to urban shift, or as only a departure from agriculture and into those sectors classified as manufacturing or industrial. However, our research, which draws on fieldwork in Ethiopia, shows that simple sectoral classifications have become increasingly unfit for purpose. Besides the process of 'servicification', i.e. the greater share of final value of manufactured goods derived from service activities like logistics, marketing and branding, we argue that there is a parallel process of the 'industrialization of freshness'. Structural change is taking place within agriculture and rural areas rather than away from them, but the implications for 'industrial' strategies are rarely discussed. Among the influences accelerating an industrialization of freshness are a globalized unbundling of production, technical change, and the increasing significance of phyto-sanitary, quality, and 'ethical' standards.

Our interviews with farm managers and owners, as well as airline managers and government officials, show that several agricultural enterprises are increasingly knowledge-intense, organizationally and technically sophisticated and by a reasonable definition 'industrial'. Moreover, we find that horticulture exports embody another dimension of complex, cross-sectoral economic activity through their reliance on extremely sophisticated logistics and transport. The horticulture export sector has created far greater demands and pressures for the development of up-to-date transport and logistics in Ethiopia than, for example, the textile and leather sectors.

We then identify, within the context of the Upper Awash Valley in Ethiopia, some of the apparently technical but, above all, socio- political constraints limiting the potential for high value agriculture to contribute to growth and structural change.

Our method and findings are very different from the literature on 'complexity' and 'product space' and they query pessimistic conclusions about 'premature deindustrialization'. And our findings suggest the need to rethink how industrial strategies can promote structural change: much more support should be directed to high value agricultural production and less focus on assembling garments or trainers in subsidized industrial parks.

Keywords: Ethiopia, exports, agriculture, industrial policy, classification, balance of payments constraint, employment.

JEL Codes: L52, L66, O13, O14, O25, Q12, Q17.

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Introduction : agricultural export growth is central to employment and avoiding growth collapse

A key concern for policymakers in Ethiopia is not only to achieve or sustain high growth rates but also to avoid growth reversals. This is because long-run growth performance depends most on avoiding steep growth collapses (Pritchett, 2016). Avoiding growth collapses over a number of years may be much more difficult than achieving episodic growth spurts. Protecting against growth collapses requires policies that address stifling foreign exchange shortages and that tackle the need for a rising demand for wage labour. Further, it requires that policymakers not only have to do the relatively 'easy' work of subsidising start ups and nurturing new sets of economic activities but also, and more importantly, that they design interventions to sustain the dynamic growth of export activities beyond the early 'easy' phase.[1] Our research suggests that in Ethiopia more resources should be channelled towards overcoming constraints on the expansion of quite well established high value agricultural exports than funnelled into new industrial plants.[2]

We argue that assembling poinsettia cuttings, for instance, is no less technologically complex than piecing together T-shirts, jeans and sports shoes. High value horticultural assembly plants using imported cutting edge technology and R&D from Holland are just as 'industrial' as iPhone assembly or stitching gloves. The policy implications, for a government seeking ways to avoid growth collapses by overcoming the balance of payments constraint on sustained growth and, at the same time, aiming to meet the aspirations of a rapidly growing labour force, are likely to involve a shift in political focus and economic support from textiles and trainers to high value agriculture. In addition, a set of new policy initiatives will probably be required for particular sectors.

In Ethiopia there has been a strong push to build new industrial parks and to attract foreign investors to set up, especially, textile and garment assembly plants in them. The employment and net foreign exchange contribution of these new Ethiopian state and private foreign investments, together with their effects in stimulating domestic linkages, remain to be seen, and they have substantial domestic resource costs (Gebreyesus and Demile 2017). The evidence in our study suggests that policy makers, in pursuing an industrial strategy, should not neglect gains from investing in agribusiness activities with already proven capacity to generate significant foreign exchange earnings and wage employment opportunities at relatively low additional cost to the public purse.

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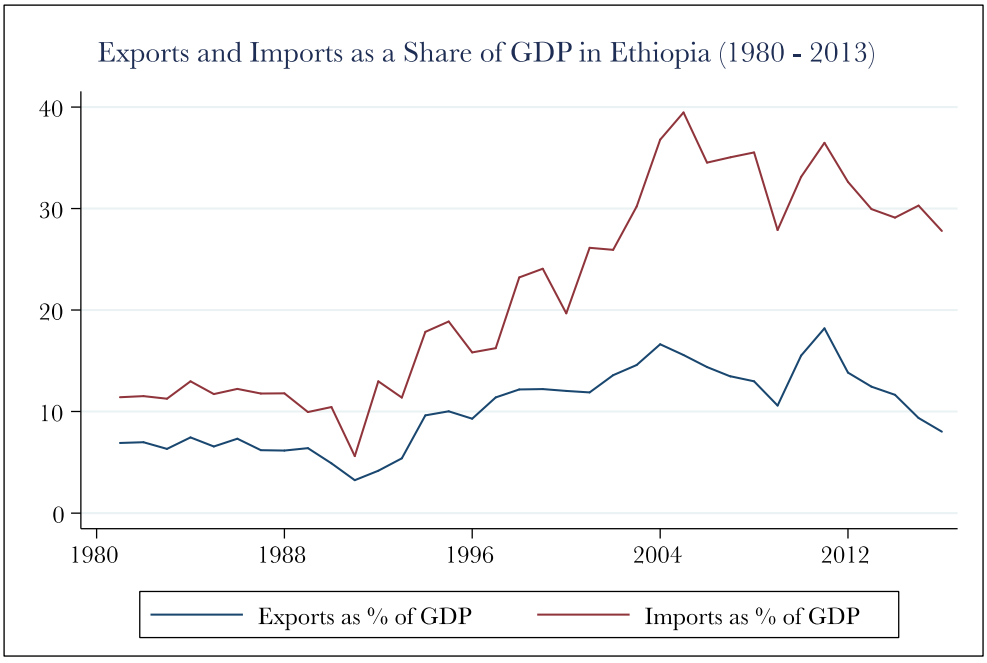
[1] Hirschman (1968) discussed the easy stages of industrialization and the political obstacles to achieving backward linkages and moving beyond the first phases of industrialization.

[2] The relationship between the volume and the value of exports provides an indication of the extent to which the product can be considered relatively high value (World Bank, 2004: 8). Cut flowers, fish, dairy, and some fresh fruit and vegetables are high value in the sense that the export value-to-volume (V-V) ratio is higher than for commodities such as tobacco, tea, and cereals. The V-V ratio for a product can change either because of price movements or because of changes to the product itself that increase its value. Such changes may include sophisticated just-in-time delivery of fresh fruit, quality improvements, or the introduction of new varietals as a result of research and development.

Economic development in Ethiopia, as elsewhere, not only requires a sustained flow of imported inputs, but for lumpy investments (for example, in power generation or air transport) also requires surges or spikes in inputs of high-cost imported technology. Growth reversals or collapses in developing economies have often been preceded by foreign exchange shortage, marked by urgent pressure to seek increased aid flows to finance immediate imported input requirements and the rising level of external debt (Arizala et al, 2017; Bagnai, et al 2017). Too often the policy conditions attached to emergency injections of concessional finance have been deflationary, while private sources of external finance also insist that governments adopt dramatic austerity measures. The result may well be a catastrophic decline in and reversal of growth. The tragic performance of the Greek economy since 2008 is an extreme illustration of the dangers of a long-term failure to expand export revenues leading to the imposition of deflationary policies resulting in a decade of growth reversal (Michalopolous, 2017: 252-3). In Ethiopia, where the gap between imports and exports growth grew dramatically during the 2000s, but where both exports and imports as a share of GDP have shrunk since 2012, (Figure 1), it is hard to over-emphasize the importance of introducing policies focused on increasing export revenues. In all developing economies, raising productivity in exports is key to raising capacity to import and rising imports are a necessity to raise productivity and avoid growth reversal (Thirlwall, 2011). A stock and flow macro-balances analysis for the Ethiopian economy confirms the significance of export growth to the continued sustainability of the government's economic strategy (Coutts and Laskiridis, 2019 forthcoming).

Figure 1. Growth producing a widening gap between imports and exports



Source: UNCTAD Data on Exports and Imports (current USD) and World Bank Data on GDP (current USD)

High-tech agricultural sectors that target fast-growing export markets are labour-intensive. Securing a reliable supply of high quality raw material throughput (herbs, vegetables, flower cuttings, fruits) generates very high levels of employment, for example in: weeding, sorting and grading, shifting crates into processing plants and packhouses and in and out of cold storage rooms, operating equipment, and in other parts of the intricate nexus of the manufacture of fresh and processed agricultural exports. Just as with urban industrial parks, so too with these rural industrial plants, there are also induced and indirect employment effects. Increasing numbers of pack houses and export quality agricultural output potentially makes viable a domestic supply of a new range of packaging materials. And at the same time rising rural employment creates rising incomes and demand for goods and services beyond just basic foods— leading to additional employment in food stalls, retail and transport services, in construction of accommodation and dormitories for migrant wage workers.

One of the most obvious and dramatic examples of the employment effects of the industrialization of freshness in Ethiopia is the rapid growth of towns like Ziway, with large inward migration of people from quite distant rural areas, attracted by employment opportunities in and linked to the floriculture concentration there (and more recently wine production). The expansion of export flower production (and subsequently of a large wine estate) has led to direct employment in greenhouses and pack houses, to induced employment in local supply of materials and services for the flower industry, and in indirect employment in construction, hairdressing, bars and restaurants, motorized rickshaw (*bjaj)* enterprises, guard labour, and more.

This employment producing flowers and wine is particularly important in the light of pessimistic arguments about the spectre of 'premature deindustrialization' and its implications for employment. Recent structural trends and sectoral shifts in employment in Ethiopia are regarded as disappointing: the officially enumerated share of total employment in Industry remains small (about 7.5 per cent in 2013).[3] This disappointment is often linked to an essentially pessimistic view that the Ethiopian and African governments more generally are in the grip of 'premature deindustrialization', by which technological change erodes the traditional gains from industrial policy. They cannot use the instruments of industrial policy to secure the radical transformations achieved in, especially, East Asia; premature deindustrialization (Rodrik 2016) is a kind of life sentence. The implications are particularly distressing for the huge and rapidly growing pool of low-skilled labour in Ethiopia: 'deindustrialization shows up most clearly and in its strongest form in employment' (Rodrik 2016, 1), and most of the manufacturing employment loss in deindustrializing economies takes place in low-skilled jobs. More generally, premature deindustrialization is often thought to mean that the gains from manufacturing as an engine of growth and catching up (from Kaldor's growth laws and Verdoorn's law to Rodrik's automatic convergence effect) are effectively no longer available to developing economies. Rodrik concludes that African economies will have to get what growth they can from the expansion of

[3] The share of manufacturing has risen a little since 2005, while the share of employment in Agriculture has fallen over the same period (from about 79 per cent to 72 per cent), underpinned by a more rapid decline in the share of total female employment in Agriculture (from 75 per cent to 65 per cent).

Services, without strong employment generating effects, and that they will have patiently to wait for skill levels to rise.

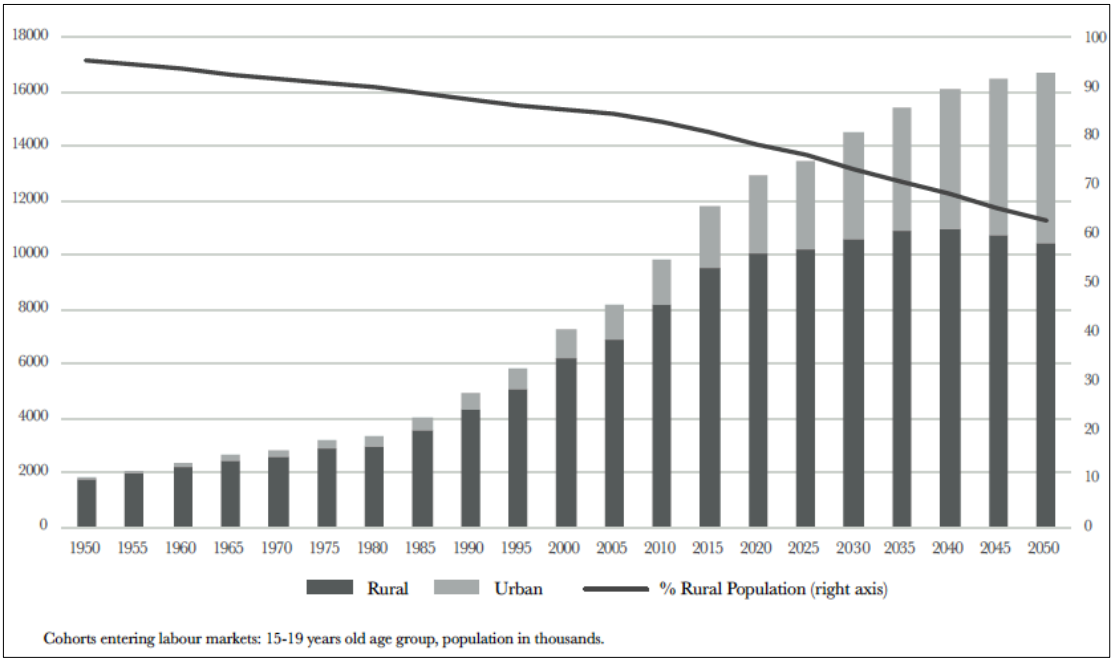
There is evidence that undermines this pessimism: deindustrialization (or an inadequate growth of Manufacture's share in employment) in other regions of the world has not everywhere proceeded at the same rate; in other words, the pace and depth of deindustrialization in OECD economies has varied depending on policy. Thus, for example, UK deindustrialization has been especially pronounced compared to that in Germany. By the same token, there is surely scope for coherent policy to make a difference in lower income countries, to slow down or put off premature deindustrialization. Thus in Ethiopia, there has in fact been a *rise* in the share of industry in GDP and in employment, albeit from an exceptionally low base (Oqubay 2019). Manufacturing employment has also grown: from 1.1 million in 1999 to almost 1.9 million by 2013 (Martins, 2018). And the wider evidence confirms that premature deindustrialization is not uniform or inevitable; countries – especially in East Asia – that adopted deliberate strategies and have succeeded in securing rapid growth through manufacturing show how important policy is to whether or not a country succumbs to premature deindustrialization (Haraguchi et al 2017).

The evidence and argument in this report also undermine the pessimism of premature deindustrialization views. First, the scope for employment through industrialization may be significantly greater once it is acknowledged that sophisticated agriculture is itself industrial. Second, the scope for employment generation within such agriculture activities is considerable, and potentially greater than in many 'manufacturing' activities.

It is crucial that agribusiness does prove capable of generating a high demand for the labour of new entrants into rural labour markets. UN estimates project that the population of rural 15-19 year olds entering labour markets in Ethiopia will continue to rise till around 2040, but that even afterwards, by 2050, *more than half* of new labour market entrants will be rural, while some 65 per cent of the total Ethiopian population will still be rural (Figure 2).

Against this background of a continued and rapid growth in the rural labour force, in Section 1 we discuss the classification of economic activities. We argue that the long-established simple sectoral division of activities is no longer the best guide to structural change or to the identification of policy priorities. Following a critical analysis of standard approaches to classification, we set out in Section 2 a new and different foundation for analyzing – and allocating resources between – economic activities, with an emphasis on industrial agricultural exports and drawing on primary research undertaken for this study. Section 3 highlights the constraints that producers in such activities in Ethiopia routinely face. We conclude by underlining the most important criteria that, in the light of the analysis in this report, may be a guide to policy design.

Figure 2. Cohorts entering rural and urban labour markets and rural population: estimates and projection for Ethiopia



Source: UN, World Urbanization Prospects, 2014 revision, and World Population Prospects, 2017 revision; authors' calculations.

I. Structural change and the classification of economic activities

1.1. Structural change and agriculture

Shifting a rising share of the labour force into higher productivity activities – typically those characterised by increasing specialisation, learning by doing, and economies of scale – is at the heart of the process of development (and constitutive of the structural change) discussed by Lewis (1954). What Lewis actually emphasized, and then analysed, was the process by which as the capitalist class grew in a low-income country (often initially a foreign capitalist class) it gathered momentum, drawing in rising numbers of people from the 'subsistence' sector and, in the process, generating savings out of the high rates of profit made possible by low wages paid to a readily available flow of unskilled workers. Savings came out of profits and credit and the capitalist class included both privately and state owned capitalist firms.

But the 'Lewis model' has been misleadingly read as a shift out of agriculture and into urban manufacturing. This together with the traditional understanding of (and indeed evidence for) Kaldor-Verdoorn insights into the contribution of manufacturing to rapid economic growth has often led to a relative neglect of agriculture. It seemed to make sense to focus on manufacturing because industrial 'development offers a high employment, high productivity path for job creation, and evidence suggests it can accelerate the pace of poverty reduction' (Newman et al. 2012). Agriculture is often regarded as what is left behind in development (as the share of agriculture in GDP, and of agricultural employment in total employment, drops), even as the

sector whose surplus may be squeezed to fund urban industrialization (Mundle, 1993). The tendency to neglect agriculture is sometimes compounded by a fatalistic belief in the Prebisch-Singer hypothesis of a secular decline in the net barter terms of trade faced by primary/agricultural commodities. [4]

This is mistaken. The shift from low to higher productivity activities envisioned by Lewis may just as much take place within agriculture as away from agriculture. There is immense scope for raising agricultural productivity in low-income countries - not just in traditional Green Revolution ways (adopting higher yielding cereal varieties, more fertilizer and irrigation) but also increasingly through the 'industrialization of freshness' – a strategy that will be discussed below.

1.2. The functions of classification

Classification should support understanding, analysis, and policy. It enables distinction between classes of phenomena. In development economics sectoral classification of activities is useful in understanding and comparing patterns of structural change. Ideas about the different properties of discrete categories of economic activity may lead to insights into the dynamics of long-run growth, structural change, and improvements in welfare. They may then influence the sectoral allocation of resources. 'Broadly speaking, [structuralist development economists] emphasized that productive sectors are different in their potential to generate growth and development' (Gala 2017; 1). Classification can always be criticized, since it involves the imposition of artificial breaks on what are typically continuous realities, in order to tame 'the wild profusion of existing things' (Foucault 1973). But so long as a classification system, with its clear boundaries between groups of phenomena, helps to reveal useful patterns and to suggest economic policy initiatives, then it is likely to be useful despite the inevitable difficulties in agreeing coding rules and precise definitions.

1.3. The traditional sectoral classification has lost analytical power

The current simple economic classification by broad sector – industry, services, and agriculture (with industry itself masking differences, or within-group heterogeneity, between manufacturing and mining) – no longer works well to distinguish between many economic activities. For purposes of understanding structural change and economic development, and for policy makers seeking to promote these aims, it now obscures more than it reveals.

To give a simple example, what is the most appropriate way to classify a punnet of blueberries destined for international trade? The blueberries are not obviously 'processed': they are not pulped or juiced, they are not skinned or de-husked or pasteurised, so they have the appearance of a classic, albeit 'non-traditional', primary commodity. But they are knowledge intense: they are the fruit of costly and highly technical research and development into genetic plant stock

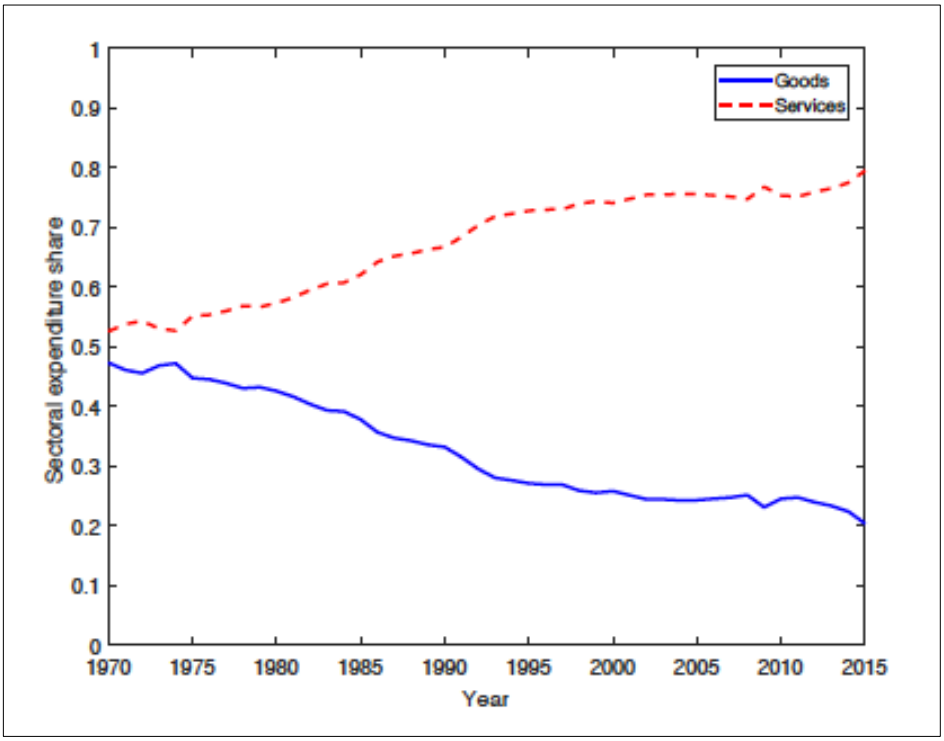
[4] A critical discussion of the evidence for Prebisch-Singer in Sub-Saharan Africa is provided by Cashin and Pattilo (2007).

material, combined with tacit knowledge about specific local agro-climatic conditions and the licensing of intellectual property; they are the product of sophisticated 'capabilities' in running large scale agri-business, sourcing inputs, negotiating government incentive schemes (or not), managing labour relations, designing marketing campaigns, making subtle adjustment judgments to the computer systems managing drip fertigation, lighting, and humidity management. And they are complex in their production and packaging, in the logistics of just-in-time exporting, and in their sales. Price and profitability depend in part on the health benefits said to be linked to them (blueberries being marketed as a 'super-food', high in anti-oxidants). So it was perhaps not surprising to hear the owner of a South African blueberry exporter lifting a blueberry from its punnet, rolling it between two fingers, and declaring: 'this is a pill'. He regarded his business as part of 'big pharma' (Cramer and Sender 2015). Should blueberry production benefit from state-subsidised incentives, public investment in R&D and infrastructure, and allocation of resources to promote blueberries in large and growing international markets? Many policymakers and some development economists would be doubtful, because, they would argue, blueberries are produced on farms, not in factories; they are not manufactured goods characterised by a large scope for linkages, for economies of scale, for learning by doing. But their arguments may be mistaken.

Herrendorf et al. (2014, 929) agree that it would be 'useful to refine the standard three-sector focus' of the literature on growth, production, and structural transformation. They note that some services like health care and education involve massive investment and high skill intensity, and are characterized by high scope for productivity increases, while others such as much of retail trade are very different. The three-sector classification of agriculture, manufacturing, and services is far too crude to capture these changes in recent economic developments, especially in advanced economies. But they also show how different ways of measuring growth—by value added or by final product—differ in how they capture the relative weight of sectoral activity.

It is not just that, for example, there is increasing interdependency between manufacturing and services, as can be seen by exploring the World Input Output Database (Timmer et al 2014). More significantly, there is a process of 'servicification': the increasing share of the value of final manufactured goods derived from services - logistics, transport, embedded software, branding, design, etc. (Koopman et al. 2010). This process underlies the dramatic increase in the share of world expenditure on services (as shown in Figure 3). Baldwin et al. (2015) argue that services have accounted for an increasing share of the value of final goods since the 1980s, and that in Asia, for example, the pattern of servicification is similar for relatively high-tech economies like Japan and South Korea and for lower wage economies like that of the Philippines. One important implication for development policy is that the 'classic focus on factories can be misleading' (Baldwin et al. 2015, 26).

Figure 3. Share of world expenditure on goods and services



Source: Lewis et al., 2017: 1

The focus on servicification has begun to encourage discussion of the breakdown of barriers between manufacturing and services, but it is still often assumed that these two 'modern' sectors are distinct from agriculture. In fact, it can seem as if some economists are stuck with very old ideas, even if economies themselves are moving on. For example, Gala et al (2017: 2) admiringly quote Adam Smith: 'The most opulent nations, indeed, generally excel all their neighbours in agriculture as well as in manufactures; but they are commonly more distinguished by their superiority in the latter than in the former'. And this because: 'The nature of agriculture, indeed, does not admit of so many subdivisions of labour, nor of so complete a separation of one business from another, as manufactures' (ibid., p.7, Book 1).[5] This leads Gala et al to make the astonishing claim that: 'Specializing in agriculture and extractive industries does not enable…technological evolution'. But in fact agriculture – at least a great deal of agriculture globally – has changed dramatically over the last 25 years. It no longer fits Smith's diagnosis, nor in fact that of Hirschman (1958, 109) who also argued, quite reasonably at the time, that there was far less scope for forward and backward linkages in agriculture than in manufacturing. One source of this change is the rise in sophisticated, globally integrated agribusiness.

[5] Even in the final sub-clause, the anachronism of parts of Smith's analysis is striking; for the *separation* between firms, very much in manufacturing as in other activities, has been eroded by the 'global business revolution' (Nolan et al, 2007) with its giant systems integrator firms and its cascading tiers of suppliers often with legal separation but *de facto* highly integrated, not arms length, arrangements among firms.

Food systems in the twenty first century involve different activities to those considered agricultural in the past; the industrialization of agricultural production means that consumer food prices are largely decoupled from the domestic or international prices of agricultural commodities. The farm value share of consumer food expenditure in the US (and elsewhere) has declined rapidly over the last 50 years, now amounting to about 15 per cent (Gollin and Probst 2015, 15). Most food is initially produced on large-scale units owned by a few farming corporations or 'landless farmers' (Cramer and Sender 2015) and distributed by a similarly concentrated group of giant supermarket retailers (Wrigley and Wood, 2018). Delivering these industrial products to consumers involves scale economies and an industrial mode of production.[6] A high and rising share of food consumption, especially in the advanced capitalist economies, is accounted for by 'ultra-processed' food products. 'These are not modified foods, but formulations mostly of cheap industrial sources of dietary energy and nutrients plus additives, using a series of processes (hence "ultra-processed"). All together, they are energy-dense, high in unhealthy types of fat, refined starches, free sugars and salt, and poor sources of protein, dietary fibre and micronutrients' (Monteiro et al, 2017: 1).

In parallel to the rise of agribusiness and ultra-processed types of food there has been an 'industrialization of freshness'. The blueberry example above is one illustration among many. A fresh orange exported from South Africa to the EU would seem to be a primary commodity and would be classified as such in the International Standard Industrial Classification (ISIC) system, as would a blueberry (under A), while a carton of orange juice might be regarded as more high-tech and as a manufactured product (C.103 in ISIC, which includes manufacture of fruit juices). Yet the carton of orange juice is industrially very simple and uses low quality oranges that would not meet the stringent quality standards for international trade in fresh oranges. Securing a reliable supply of high quality fresh oranges for the EU or other demanding markets is more complex, and more technically difficult than producing a carton of orange juice. Below we develop this idea, drawing on fieldwork in Ethiopia to show its relevance in low-income developing countries. The industrialization of freshness is on a par with servicification and it helps to show how awkward, how poorly 'fit for purpose' are many efforts to develop economic analysis on the basis of misleading classifications and simplistic definitions of 'processing'. And we argue that the influential work of Wood (2017: 9) is misleading, when it asserts: 'Processed primary exports are…clearly more skill-intensive than unprocessed primary exports'.

1.4. Efforts to refine categorical distinctions

Economic activities within sectors have become ever more closely intertwined, till the level of categorical imbrication breaks down the distinctions between them. In response to the shortcomings of the standard three-sector classification of economic activity, economists have made a number of attempts to refine the categories or introduce new ways of distinguishing among outputs. These have been suggestive: they do attempt to capture the dimensions of global capitalism poorly accounted for by corralling activities into the three rudimentary paddocks of

[6] The massive and increasing scale of farms in the USA and the dramatic recent consolidation of farm production are discussed in MacDonald et al (2018).

industry, services, and agriculture or primary commodities. Economists have also suggested policy conclusions, though not always dramatically new or different ones compared to the most widespread policy advice internationally. But these recent categorical endeavours have some significant shortcomings, which we will discuss in some detail below.

One influential exercise designed to reveal key patterns, dynamics and trends in the global structure of production is the work on economic complexity: Hidalgo and Hausmann define complexity in terms of the 'mutliplicity of knowledge' embodied in outputs and as expressed in the composition of output. Generally, their Economic Atlas of Complexity shows that richer countries produce more complex outputs than lower income countries. There is, however, variation. This variation can be explained because outlier countries (with a higher 'economic complexity index' (ECI) score than would be predicted by their average income per capita) may be expected to grow faster than others at similar income levels (Hidalgo and Hausmann 2009).

This work has also been linked to ideas of 'product space', such that countries are expected to produce and export most easily a range of goods that are closely related to what they already produce: patterns of production and trade are path dependent. And others suggest that there is a range – largely occupied by middle-income developing countries – where economies may begin to shift away from the 'normal' path to produce outputs less closely related to what they already produce (Pinheiro et al 2018: 3). The key technique for Hidalgo and Hausmann in identifying shades of complexity is to assess where a product fits along the axes of 'ubiquity' and 'diversity'. Complex products are not produced by many countries: they are not ubiquitous. But some products are not ubiquitous yet are not highly complex either – diamond mining, for example. So an index of complexity for a country needs to assess product diversity too: whether a country produces a wide array of products. If an economy is characterised by diverse products and relatively rare – non-ubiquitous – products, it is deemed to score highly on the ECI.

There is some circularity in the definitions of complexity. Economies are complex if they produce complex goods. Knowledge intense places are 'those that produce knowledge intense activities, and knowledge intense activities are those produced by knowledge intense places' (Pinheiro et al 2018: 5). And it is difficult to escape the impression that much of the analysis is a (sophisticated) way of describing the rather obvious: for example, the idea that 'high income countries have a higher tendency to diversify into more unrelated and sophisticated technologies' (Pinheiro et al 2018: 6). It is also unclear why there is so much variation and what accounts for shifts over time. The implication – and the apparently underlying assumption – is that movement up the ECI scorecard is usually determined by prior changes in comparative advantage, very slowly shaped by realignments of factor endowment and signalled by market prices. Pinheiro et al (2018: 6) simply echo the old Washington Consensus view when they suggest that countries with 'more liberal, and less coordinated, forms of capitalism' are more likely to move into more diverse production structures. Despite the evidence that some countries have a much higher ECI than their income per capita would predict and that some countries clearly shift into 'unrelated' products before becoming classified as high income economies, 'these results do not imply that all countries are able and should [sic] invest in unrelated variety growth' (ibid, 24).

Some of the economic complexity literature appears to rely on a version of the augmented Hecksher-Ohlin factor endowment approach to comparative advantage in Wood (2017). In Wood's view shifts in the global pattern of production and trade are largely in line with and accounted for by differences in the ratio of cultivable land to skills (partially mediated by the reduction not only in production costs but coordination costs in an era of globalized trade). Others stress the dangers of 'defying comparative advantage'. Like the old dependency theorists, these economists are pessimistic about the sustainable results of encouraging foreign direct investors to export products that are not as labour intensive as a country's existing endowment of labour suggest they should be. For example, they believe that the medium-term results in most low-income developing countries of defying comparative advantage by attracting FDI into complex processing industries 'could well hinder further transformation of the productive structure by locking the economy into a specialization trap in assembly industries' (Lectard and Rougier, 2018: 105).

Further, there is a methodological problem with the economic complexity index. It is built in reverse and smacks of data mining; the starting point is to use recent international trade data to find 'revealed comparative advantage' and to proxy for the structure of production. One commonly acknowledged problem with this is that it may lead to an under-appreciation of complexity in those economies that have large domestic markets, produce a diverse range of outputs, but are not big exporters of diverse goods. Another difficulty is that this approach makes assumptions about the complexity of products, of their level of embodied technical knowledge (explicit and tacit), based on ubiquity and diversity, without direct observation of production processes. This may work well as a convenient insight into certain dimensions of complexity but it risks failing to pick up some forms of complexity and sophistication - in agribusiness, for example. Data problems, including the lack of a sufficient level of disaggregation in international datasets, compound the problem. As Gala et al (2017: 3) put it, the 'kind of empirical analysis we do here is, thus, somewhat ad hoc, due to the unavailability of data at the disaggregation level needed'. Their own example shows that it is 'not easy to empirically separate manufacturing related services from other types of services' (idem).

One illustration of the difficulties faced by the economic complexity literature is in the treatment of Brazil. According to analysis of panel data on economic complexity: 'Problematic emerging countries show no productive structure improvements; the spotlight, here, falls on Brazil that shows one of the worst dynamics of ECI among emerging countries in recent years' (Gala et al, 2017: 4). But this assessment of Brazil appears to flow from a prior definition of agricultural production as lacking complexity. It is difficult to understand Brazilian economic growth, without recognising that many of the most dynamic activities have precisely been in very large-scale, knowledge-intense, technically sophisticated and innovative agriculture (OECD-FAO, 2015: 62; Hopewell, 2016). Large farms (over 500 ha) are making a critical and a growing contribution to exports and to the total value of Brazilian agricultural output (Helfand et al, 2017). Brazil's Arabica coffee yields per hectare are the highest in the world (Neumann, 2012: 19). Brazil leads the world in efficient sugar and soya production (Safdar, 2015). Brazil's success in paper and pulp and related products, leather goods, ethanol, cotton, soya, poultry, etc. owes a lot to the

integration of agriculture with manufacturing, publicly funded research and development, and services (including government services, which are arbitrarily deemed to be less sophisticated by definition than private services). [7] Brazilian experience also suggests far more emphasis should be given to policy choices than to ineluctable, path dependent structural patterns.

Other recent literature makes some progress in overcoming the dismissive analytical assumptions about the 'sophistication' of agriculture and its role in structural change. Mendez-Ramos et al (2017) distinguish between 'primary' and 'manufactured' agribusiness, on the back of empirical analysis showing the huge and rising significance of agribusiness trade in the growth of developing countries in recent decades. Divanbeigi et al (2016) summarise how structural transformation has taken place within the agriculture sector through modernization and technical change, rising productivity, and increasing integration with other sectoral activities. Drawing on the SIC system (see above) they make an effort to allocate agribusinesses between primary, (including the agriculture, livestock and fisheries SIC sub-categories), and manufacturing agribusinesses (falling into one of ten SIC sub-categories: canned, cereals, drinks, leather, meat, oils, paper, tobacco, wood, and other). Together with their acknowledgement (p.1) that traded agribusiness 'cannot exactly be determined, given its links with other activities in the economy', their work provides a clear illustration of the difficulties in avoiding ad hoc allocations and establishing clear coding rules and observations to support a rigorous, consistent, and useful classification scheme.

Some analytical confusion has always existed in economists' research on these topics, because of the way that trade and production statistics internationally classify sectors of production. Wood and Mayer (1998), for example, distinguish between three groups of product: manufactures, processed primary products, and unprocessed primary products. Their definition of manufactures is narrow: they use the Standard International Trade Classification (SITC) categories 5-8 minus non-ferrous metals. SITC classifies everything else as primary products, whether processed or not. Production and employment statisticians, though, as Wood and Mayer point out, use the broader, ISIC, category of manufactures that includes what Wood and Mayer (1998, 6) consider processed primary products, i.e. goods that are 'also produced in factories, but which use large inputs of local raw materials—for example, canned tuna, wine, cigarettes, paper and aluminium ingots'.

Wood and Mayer make a further breakdown of their initial grouping of products, to account for high skill and low skill manufacturing, for agriculture and minerals and fuel, and for a division of agriculture into 'static' and 'dynamic' products. Dynamic products here are those for which there is a high (greater than one) income elasticity of demand and whose expansion has been important

[7] There is nothing new in this. Henry Ford's Model T assembly line innovations owed a great deal to agro-industry: The 'industry that apparently had the greatest influence on Ford was meatpacking, where the *disassembly* of animals was done by hanging newly killed carcasses on an overhead conveyor, moving them from worker to worker, each of whom made a particular cut or removed particular pieces, until the animal had been reduced to smaller chunks of meat that might then undergo further processing. Implicit in continuous flow processing was an intense division of labor' (Freeman 2018: 121).

to the growth of a number of developing countries. [8] Their point is that there are unprocessed but nevertheless dynamic primary commodities (1998, 11). Our suggestion is that there may be a high income elasticity of demand not only for agricultural products that are 'industrial' in our terms, but also for products that have other high value attributes (being organic or with other ethically or emotionally valued attributes).

We have outlined some of the different, overlapping, and at times conflicting ways of classifying primary, processed primary, and manufactured goods. They all share the idea that these types of good require different resource inputs. In Wood and Mayer, for example, 'the basic difference between the resource inputs needed for manufacturing and for primary production is that the former requires a much higher ratio of skill to land' (1998, 4), with the implication that agricultural production requires very little skill because it requires little by way of transformation and value addition to what nature and some tried and tested practices provide. Their idiosyncratic definition of processed primary products includes only those products where processing takes place in factories. But in modern agricultural production even the distinction between 'harvesting' and 'processing' is not always clear cut; in the USA, for example, it has been suggested that harvesting be defined to include extremely sophisticated (quasi-processing) operations, such as: 'cooling, field coring, filtering, gathering, hulling, shelling, sifting, threshing, trimming of outer leaves of, and washing raw agricultural commodities grown on a farm' (U.S. Department of Health and Human Services Food and Drug Administration, 2016: 8).

1.5. The 'intricate nexus' of industrial or roundabout production

A more fruitful way to understand processing and manufacturing than a factory focus is to consider the historical evolution of manufacturing and the industrial. Adam Smith (1776) refined analysis of different types of division of labour, including the division of labour in the production of specific goods, such as a woolen coat,

> "the produce of the joint labour of a great multitude of workmen. The shepherd, the sorter of the wool, the wool-comber or carder, the dyer, the scribbler, the spinner, the weaver, the fuller, the dresser, with many others, must all join their arts in order to complete…this…production. How many merchants and carriers, besides, must have been employed in transporting those materials from some of those workmen to others who often live in a very distant part of the country!...How many ship-builders, sailors, sail-makers, rope-makers, must have been employed in order to bring together the different drugs made use of by the dyer, which often come from the remotest corners of the world" (Smith [1776], 1979, 22–23).

As Ho (2015) points out, Smith was analyzing the earlier stages of industrial capitalism; Marx, later ([1867] 1977), was able to describe and analyze the transition to large-scale industrial

[8] Another tradition in economics regards certain products as 'dynamic' or as 'manufactured' by reference to the degree of transformation in the production process, the degree of '*roundaboutness*' in production.

capitalism. First, the work of individual workmen and their tools in Smith's division of labour is transformed by power-driven machinery. Then machines are deployed in larger collective and organized systems.

While Marx may have emphasized the tendency towards economies of scale within specific firms and the integration of large-scale production, Young (1928) emphasized more the complementary tendency to industrial differentiation, the splitting of complex processes into sets or chains of simpler processes. Over 'a large part of the field of industry,' wrote Young, 'an increasingly intricate nexus has inserted itself between the producer of raw materials and the consumer of the final product' (1928, 538; quoted in Ho). From Young's perspective, what matters is less whether or not production takes place in factories than what forms of industrial organization are at play and how roundabout is production.

Hirschman came to accept that there are more linkages backward and forward— as well as fiscal and consumption linkages—associated with agricultural production than he had initially supposed. His views on the dynamic potential of primary commodity linkages have recently been re-stated, as well as simplified, by Kaplinsky (2011). But neither Hirschman nor others anticipated the extent to which the sophistication of roundabout production processes and complex forms of industrial organization might move into agriculture. An 'increasingly intricate nexus' is currently inserting itself between African rural producers, of a fresh orange, blueberry, avocado or pelargonium, and the consumers of the final product in the supermarkets of advanced capitalist economies. This makes for the industrialization of freshness.

Moreover, the development of more processed products may depend on innovation within the primary agricultural sector itself. Brazil—a world leader in the paper and pulp industry—provides one example. The success of this sector is underpinned by state financing of one of the world's leading centers of agricultural research, EMBRAPA, which coordinates a decentralized network of research institutes that have been central to the diversity of experimentation that innovation-based strategies in agriculture require (Correa and Schmidt 2014). For example, the development of new seed varieties of eucalyptus trees by EMBRAPA researchers (more than 2,000 PhD graduates among them) has been central to the product innovation in Brazilian paper and pulp products (Figueredo 2014).

Similarly, in Chile state commitment to university research and training in agronomy and to establishing collaboration with the UC Davis-Chile Life Sciences Innovation Center - that addresses key issues of plant pathogen detection, genetic identification of nursery stocks and water use efficiency – underpins a horticultural industry with an annual export value of about $4.5 billion (Moran, 2018: 1).[9] Chile's success in exporting fruit reflects a broader and important trend: between 1995 and 2013, the growth in the value of world imports of agricultural commodities was quite rapid, but much faster growth rates were achieved by those agricultural products classified as '*consumer-orientated*'. The USDA distinguishes between three types of

[9] In 1980 the value of these exports was only $168 million (Larson et al, 2015: 84).

agricultural products: bulk, intermediate and consumer-orientated; they define bulk and intermediate goods as: 'homogeneous and/or storable and used primarily by industry. In contrast, *consumer-oriented* products like fruits, nuts, vegetables, meats, and processed food products may or may not have a high income elasticity of demand, but are likely to be purchased directly by consumers' (Beckman et al, 2017:18).

II. A basis for moving away from sectoral classification of activities

2.1 A different analytical starting point

Rather than working backwards – as the economic complexity index does, taking published trade data as a proxy for an enduring productive structure and basing the analysis entirely on 'what can be "seen" from historic trends in world trade data' (Gala et al 2017: 4) – we begin with the direct observation of current productive activities in Ethiopia. We also consider activities more broadly than Palma (2014), acknowledging that the allocation to standard sectors of particular economic activities may be ambiguous; we focus on the scope for particular activities to lead to rising productivity, complexity or sophistication, and to employment gains. Our method starts by drawing on primary field research rather than secondary datasets. And we deploy a definition of the 'industrial' that focuses on the insertion of an 'intricate nexus' between raw commodity and output and on the development of 'roundabout' economic processes. This definition takes in the 'lengthy linkage of production phases' (Gala et al 2017: 2) of interest to scholars of economic complexity.

And this method leads to the finding that agriculture is, to hugely varying degrees, highly and increasingly complex. This is so in ways that confound even the brave efforts to distinguish between 'primary agribusiness' and 'manufactured agribusiness' or the more usual distinction between primary commodity exports and processed primary commodities. We find that the 'collective pool of resources' that Gala et al (2017: 3) argue is shared between manufacturing and services (through 'industrial commons') is often also shared with agriculture. And given the increasing complexity, technical sophistication, scope for rising labour productivity, and scope for large-scale employment (and foreign exchange earnings), we then go on to argue that policy priorities (and resource allocations) derived from misleading categorical analysis may reduce growth rates and expose economies to a greater risk of growth collapses. The policies we question may be poorly designed to maximise the prospects of rapid employment growth among the poorest (i.e. they are not sufficiently 'inclusive'); they may not generate the highest possible rate of growth of employment for a given level of investment. Further, as we argue below, recalibrating activities away from traditional three-sector classification may show that in some respects deindustrialization, and the spectre of premature deindustrialization, is illusory.[10] We illustrate these arguments by detailed reference to two types of agribusiness activity in Ethiopia – plant propagation and the manufacturing of juice.

[10] Besides, the evidence confirms that premature deindustrialization, even on traditional sectoral distinctions, is not an inevitable stage of capitalist development but has a great deal to do with policy choices (Haraguchi et al 2017; Palma 2014).

2.2 Plant propagation (ISIC Rev.4: A.013)

The asexual propagation of plants, by cuttings or division, is assumed in the ISIC system to be a *simple* agricultural process. And in its basics it is, but once a certain scale is introduced and a level of care applied to assure the right conditions to ensure higher productivity while meeting international phyto-sanitary requirements, propagation becomes a more roundabout, intricate process. The process depends on the plant and where it is grown. In Ethiopia, for example, there are perfect conditions for propagating pelargoniums but to propagate higher priced poinsettias the air is too dry so techniques must be applied to raise and manage humidity.

Firms specializing in propagation of ornamentals are integrated into a global production network. The 'value chain' runs from the establishing of a mother stock, through propagation of cuttings, setting new plants in plugs, packaging and transporting these to the Netherlands (from Africa, Latin America, or within the Netherlands from more costly heated glass greenhouses), development and repotting, transfer to garden centres and supermarkets, and final sales. At the apex sit Netherlands-based integrator firms. In one case, a relatively small firm based in the Upper Awash Valley in Ethiopia was set up as a legally independent entity but relied on very close links to a huge Dutch firm; in 2017 the propagator became formally part of the larger firm. Both firms where we interviewed use reverse osmosis (RO) technology to remove unwanted particles (especially bicarbonates) dissolved in water. A reverse osmosis machine may cost €150,000 and it costs €30,000 to change the membrane. One of the firms uses its own solar plant to generate power. Under the plastic greenhouse canopies, elaborate piping along the ground and up in the metal frames enables a precise regulation of water and nutrients, of misting to maintain humidity levels required for poinsettia plants, and light. One firm owner agreed that they have to 'torture the plants' by regular spates of (radium bulb) light on and off, a form of sleep deprivation for the cuttings. One 12 hectare propagation farm spent €50,000 on a single piece of equipment to produce fine misting in a greenhouse. Plastic greenhouse covers are much cheaper than the glass ones that have to be used in the Netherlands but they are far from crude, developed on the basis of many years of R&D. Each plastic sheet has seven layers, including UV filters.

Adhering to strict phyto-sanitary rules regulating market entry into the EU involves, among other things, very careful management of clothing and of movement between greenhouses or between a greenhouse and other parts of the farm. Firms have rules for who can enter greenhouses, what they wear, and how they must tread through disinfectant pools between inside and outside the greenhouse. One cutting edge large-scale firm had large blocks of lockers where the hundreds of workers store their own clothes and change into overalls and imported 'crocs' sandals. These rules add to the demands for labour supervision, and this may come to form part of the tacit knowledge that sets a parameter for judging the optimal maximum size of a cuttings farm. We did a rough count of about 50 computers in the administrative offices of this farm. Profitability also requires 'guard labour' (Bowles and Jayadev, 2004) and technology: one firm was, in early 2018, in the process of switching from fingerprinting to face recognition technology to manage security on site.

Figure 4. Misting, light regulation, pest control (Upper Awash Valley)

Source: Authors' photograph

Figure 5. Changing area, Dümmen Orange (Oromia)

Source: Authors' photograph

The nexus of activities, mechanisms and processes inserted between the raw commodity (the origins of the mother stock) and the final consumer is an intricate one. It has been driven by a variety of forces, including the global unbundling of production, pressures to respond to input cost and pressures of resource scarcity, and the increasing role of phyto-sanitary, quality, and other product standards. The assembly of a poinsettia involves a great deal of machinery (power plants, reverse osmosis machines, tractors, computers, misting and fertigation equipment, soft plug production, steaming soil to disinfect it, laboratory testing facilities, cooling the cuttings to 4 degrees for 24 hours, maintaining refrigerated trucks) and is distinctly roundabout. Firm managers accumulate and deploy tacit knowledge – about highly localised agro-climatic conditions and variations, about labour relations and supervision requirements, about 'the market', about sources of efficiency in the organization of production, about the broader policy environment, institutions and politics in Ethiopia that affect their operations. This combines with a great deal of technical expertise. For example, technical and tacit knowledge have gone into the 'fifty years of breeding' to produce a mother stock of ten plants held by one European firm in Ethiopia. (For political reasons a decision has recently been made to divide this precious stock into two, holding half in Uganda). So plant propagation is 'knowledge intense' and in this sense complex or sophisticated. There are also multiple, complex linkage effects between plant propagation on a farm and packaging, input production and supplies, capital goods, work clothing production, transport, logistics, and the development of cold storage and freight facilities at Addis Ababa's Bole International Airport (see below). The extent to which these linkage effects are being exploited by a capitalist class within Ethiopia is problematic and we discuss this below. Finally, the difficulty in classifying plant propagation (given the weaving together of manufacturing, agriculture and services) was brought home to us by the manager of one firm propagating ornamentals whose offices were papered with the arty branding and advertising posters of the linked multinational firm. We used to think we exported flowers, he said. 'Now I realise we are exporting emotion'.[11]

Source: Dümmen Orange

[11] The branding company that redesigned the visual branding of Dümmen Orange wrote in a case study: 'We crafted a new accompanying tagline, For You, which instantly captures a sincere, universal expression – often shared with a gift of flowers – that speaks to the very heart of their mission' (http://www.bigredrooster.com/case-study/dummen-orange/).

2.3 Manufacture of juice (ISIC Rev.4: C.103)

Manufacturing fruit juice (and pulps or purées) would seem a step up in sophistication from simple agriculture. We have already questioned this assumption, pointing out that producing high quality fresh oranges for export may be more challenging, more technically complex and knowledge-intense, than squeezing poor quality oranges into juice cartons. A similarly paradoxical contrast might be drawn between a low-value and technologically unsophisticated 'processed' product like avocado oil and a fresh export quality avocado, specifically bred, pre-cooled, chilled, packaged and processed to ripen (in post-harvest gaseous ripening facilities) exactly three days after shipment to EU supermarkets. 'Just in time' industrial organization, famously developed in Japanese manufacturing, is now fundamental to the competitive success of international agriculture. International agreements such as the Global Gap voluntary standards, widely used in international trade and in contracts with the major retail groups, have accelerated these trends, imposing requirements for barcoding, traceability, spraying and residue detection—all part of the increasingly intricate nexus inserting itself between increasingly large-scale "farming" and the final product at the point of purchase.

Certainly, the process for juicing passion fruit or mangoes fits into Allyn Young's discussion of industry: it is broken down into a series of intricate steps and requires specialized equipment. Condensing juice into concentrate requires even more sophisticated and costly evaporator machinery. Most of the equipment – the pulping and juicing machines, the condenser, and the machines used to pack mango or passion fruit puree into aseptic bags – is imported from Parma in Italy, a global leader in agricultural processing equipment (buying an evaporator might cost roughly $700,000). Figure 4 reproduces a mango puree extraction flow chart from AfricaJuice Tibila S.C. in the Upper Awash Valley (Ethiopia). There are 20 main steps between receiving the fresh fruit and dispatch from the processing shed (besides the other steps associated with waste and by-product management).

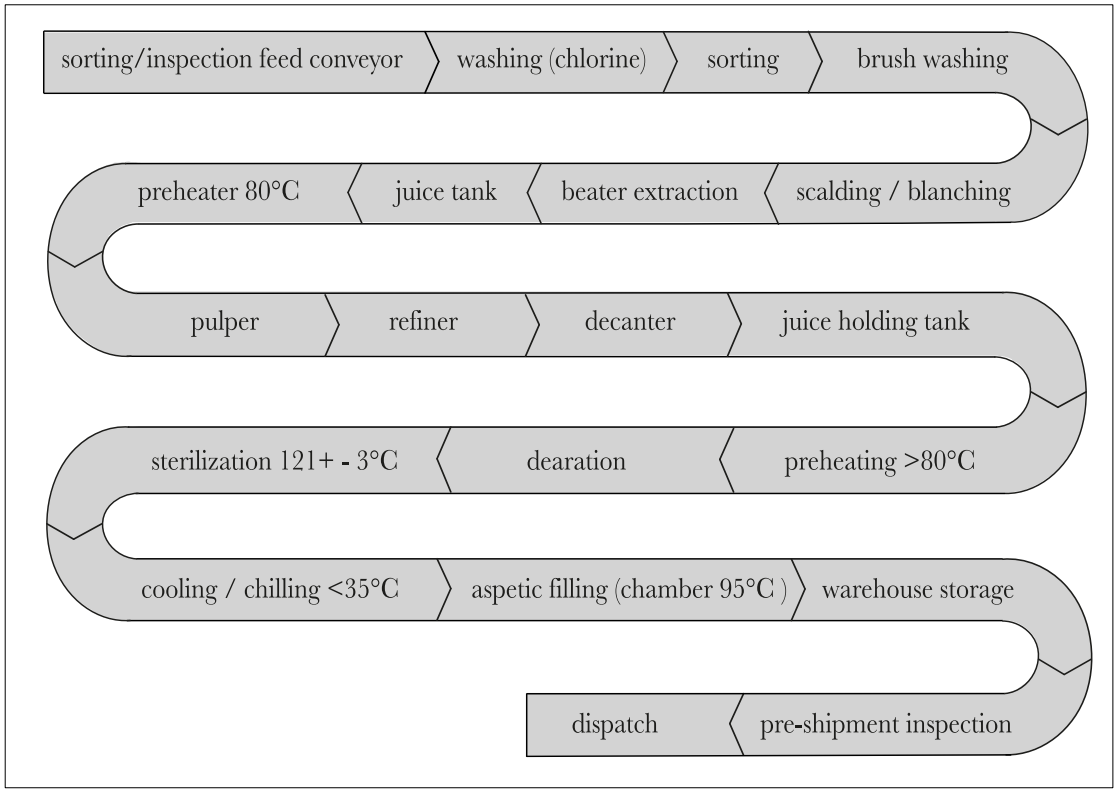
It is this machine-mediated process that most obviously qualifies juicing as manufacturing. But it is managing production in the fields of sufficient, reliable supplies of good enough quality passion fruit (or mango) in the first place that makes this business particularly complex, sophisticated, and difficult. We develop further below the distinction between easy and difficult, for it matters to policy. But the relevant indicators are, first, that the condensing machinery at a large passion fruit firm where we interviewed has *never* been used and, second, that in this farm as in other related farms in Ethiopia capacity utilization of the juicing equipment has been very low, because of inadequate and erratic throughput of raw material.

Figure 6. limited throughput of high quality passion fruit (Upper Awash Valley)

Source: Authors' photograph

While we focus below on the types of constraint typically holding back the expansion of high value agricultural exports from Ethiopia, here we highlight some features of large-scale passion fruit farming to show the complexity of the production process. Passion fruit provides a very good example of a feature common across much high productivity agribusiness: it depends on just-in-time production processes. As in the Japanese auto industry, these processes require sophisticated organization of production. In agriculture just-in-time production probably also depends more on tacit knowledge than the more readily codified and transferrable knowledge in auto-assembly. Across hundreds of hectares trellises with the right tautness of the wires between poles bear the weight of passion plants, whose fruit bearing shoots hang down growing fast in the light and warmth of the Upper Awash Valley. The plants have to be continuously pruned to maximize fruit bearing and to make sure the drooping tendrils do not reach the ground. The fruit has to be harvested every day (though there is a lull for a couple of months). And the most important part of the process is the *daily* hand cross-pollination, i.e. pollinating between flowers on different plants across from each other on different trellises. The 'birds and the bees' would not produce anything like a commercially viable rate of pollination. And this hand pollination must be done within a one-hour slot each afternoon. That means supervisors have to monitor flowering quickly and precisely across a large area and to manage pollinators. (Another example of just-in-time agribusiness is in pelargonium cuttings, which must be harvested one day, packed the same evening, transported to Bole International Airport, and flown to Europe the next day.) Large-scale hand pollination, daily pruning and harvesting, in variable climate conditions with (see below) troubled access to water is what really presents a challenge of complexity to a business and its (in this case global) financiers.

Figure 7. Mango Puree Extraction and Process Flow Chart



Source: adapted from sheet at AfricaJuice Tibila S.C.

2.4 The state owned airline infrastructure at the heart of agricultural exports

Horticulture exports embody another dimension of complex, cross-sectoral economic activity through their reliance on extremely sophisticated logistics and transport. The horticulture export sector has created far greater demands and pressures for the development of up-to-date transport and logistics in Ethiopia than, for example, the textile and leather sectors. This is because delivering freshness (whether in flowers or fruit) requires cold storage and just-in-time air delivery; a delayed delivery of textiles or leather goods might cause significant financial loss and reputation damage, but is unlikely to be disastrous. Cold storage includes both the on-farm cold rooms (including the rapid cooling facility required by herb producers) and the airport cold storage warehouses.

Through complex feedback mechanisms the demands of horticulture have both contributed to and been supported by the remarkable of growth of state-owned Ethiopian Airlines (EAL) - now the leading passenger and cargo carrier in Africa and one of the world's most profitable airlines. The initial growth of the floriculture sector was facilitated by EAL and at the same time created a pressure for EAL to provide airfreight facilities. They began by leasing ageing cargo jets, but the expense of this, as well as the rapid growth in floricultural exports, led the company to buy new freight jets. As of early 2018 EAL had eight freight jets and planned to grow to 19 by 2025. EAL (which is now divided into seven different businesses) also plans to expand the 1 million ton

warehouse capacity to 1.5 million tons by 2025. It employs 13,000 people, with planned expansion to 17,000. EAL already works with global firms to improve human resources and infrastructure management and is developing a joint venture with DHL to integrate itself into the global value chain for logistics.

Not only has Ethiopian Airlines developed state-of-the-art cold storage and warehouse facilities, a catering enterprise, an international hotel, and numerous routes in Europe, Asia, and North America, it has also become a regional aviation leader in sophisticated activities such as aircraft maintenance, as well as pilot and crew training. Moreover, the urgency of the need to develop just-in-time delivery has had an indirect 'political' linkage effect: it has prompted EA to become the focal point in the long-overdue modernisation of the Ethiopian Customs and Revenues Authority. This has been achieved in two ways. First, EAL has become, more than any business association in Ethiopia, the main actor that pressures the customs authority to expedite transactions. Second, it is near completing a series of advanced technology e-customs platforms to facilitate and trace imports and exports. (This development may have a further benefit if it facilitates the timely collection and analysis of reliable trade data, the lack of which is a significant constraint on effective policy making.)

The literature on economic complexity sometimes labels 'government services' as simple, unsophisticated. But the pursuit of profitability in Ethiopian horticulture and floriculture shows how government services, including security services, cannot be treated as categorically distinct from sophisticated agro-industrial exports. Milling about outside the airport cold storage facilities are armed soldiers. It is mandatory for horticulture exporters to have state security provision on every truck from farm to customs point. Farm managers we spoke to were happy with this arrangement, which reinforces the ways in which an effective state provides the conditions of accumulation and profitability.

III. Constraints on the expansion of sophisticated agricultural exports from Ethiopia

It has not, for several reasons, been possible to achieve an *accelerating* expansion of high value agricultural exports from Ethiopia, or to reap the benefits and spread effects of such an expansion. The constraints on the expansion of these exports obviously include 'resources' like land and water, infrastructure and input supplies (the state of the roads, unreliable power supplies), the tangle of rules, regulations and bureaucratic obstacles that slow down and raise costs of trading, foreign exchange shortages, and other issues that at first blush may be defined as straightforwardly economic or technical.[12] But every single constraint turns out to have a fundamentally socio-political source. Long ago Hirschman (1968) observed the same thing in trying to understand the dynamics of industrialization in Latin America: 'there is far more to the vigor or weakness which late industrialization displays in various countries than minimum

[12] Getahun et al's (2018) survey of constraints on manufacturing competitiveness in Ethiopia complements our findings.

economic size of plants, market size, and even foreign exchange availabilities…the process…depends on…numerous economic, sociological and technological factors…' (ibid., p.24).

Although we regard the 'sociological' factors as decisive, we begin by drawing attention to the inadequacy of the statistical base available to policy makers; we then highlight some of the main resource constraints, infrastructure and input supplies, and institutional issues, in each case showing how the issue affects the growth of exports, profitability, productivity and employment before pointing to the deeper socio-political determinants of resource and institutional constraints. Then we discuss the distinction between 'easy' and 'difficult' phases and dimensions of structural change and the industrialisation of agriculture. We finish the section by suggesting that economic policy in Ethiopia in recent years is characterised by the political economy of being in a rush. This perspective emphasises the links between the deep-seated, historically enduring political economy of Ethiopia and the technical aspects of economic policy management and performance.

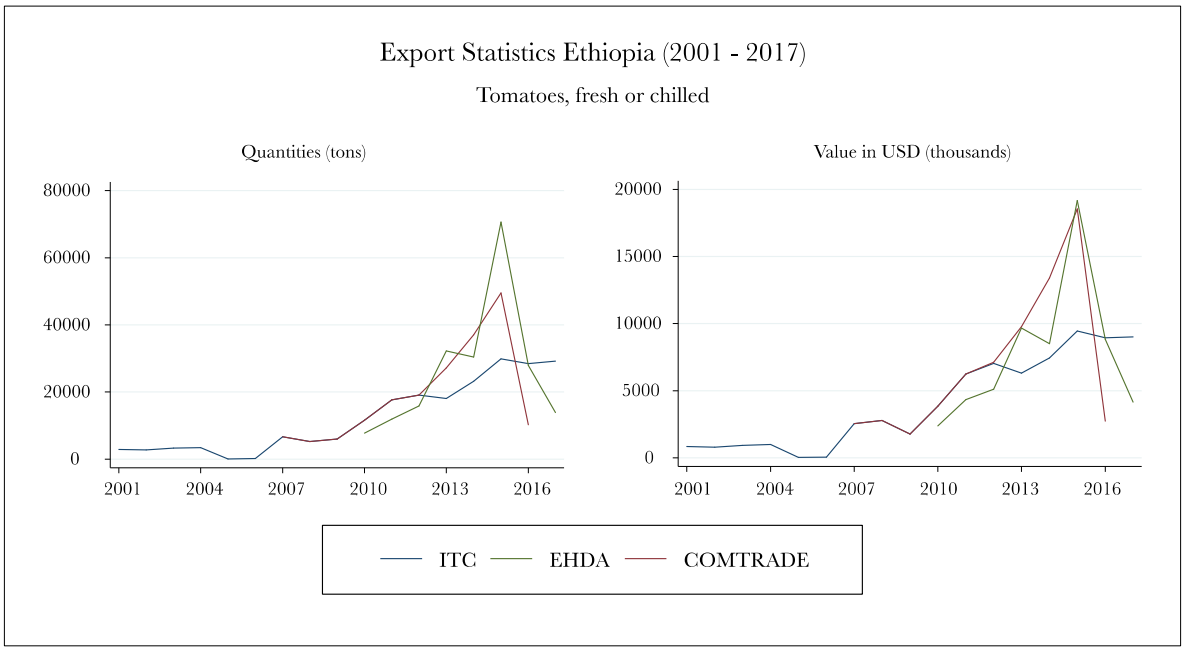
3.1 Data gaps and inconsistencies

Effective resource allocation requires reliable data. To work out whether interventions have had the desired effect, to assess eligibility for support according to strategic criteria, to manage the social and political implications of investments, subsidies, land leases, and tax incentives, to weigh up the relative returns to alternative allocations of scarce public funding: all these depend on the consistent collection and reporting of accurate, relevant evidence.

It may be, for example, that horticultural exports, because of the relatively sophisticated activities involved in their production and trade, generate greater value added and export revenue per dollar of investment than 'industrial' goods such as standard mid-level quality leather or textile goods. But it is not possible at present to make this kind of judgement precisely because of a lack of readily available data.

Putting the primary field research for this study into a context of broader trends has not been easy, because of a number of difficulties in establishing convincing time series trends. Different Ethiopian official sources do not agree with each other; and there are differences between trends and levels reported by Ethiopian agencies and international agencies, despite the latter drawing primarily on Ethiopian official data for their own estimates. For example, Figure 5 illustrates this using data on the volume of tomato exports, drawing on UN COMTRADE, ITC World Trade Map, and Ethiopian Horticultural Development Agency (EHDA) data. The international data series themselves draw on Ethiopian figures, including Ethiopian Revenue and Customs Authority (ERCA), Central Statistical Agency (CSA), and EHDA data.

Figure 8. Estimated trends of Ethiopian tomato exports in three data sets

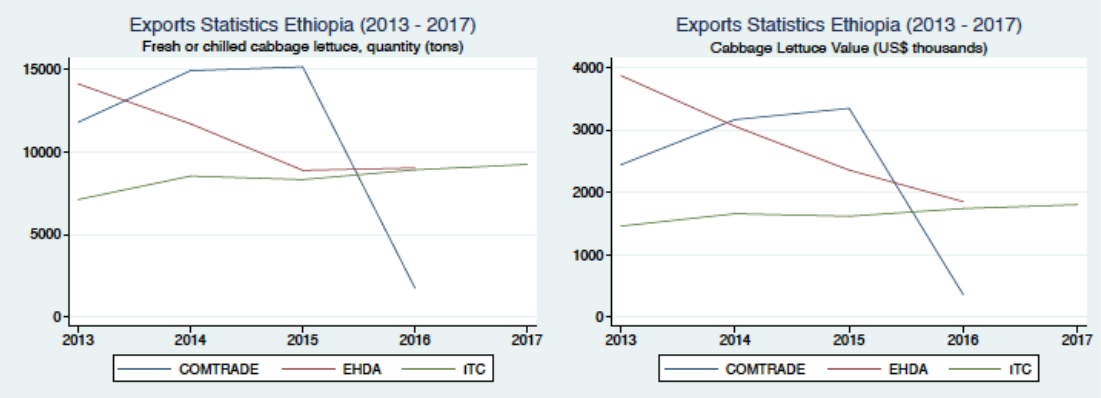


Source: ITC, EHDA and COMTRADE data, authors' calculations.

Looking closely at specific data sets compounds these difficulties. For example, to establish a trend in the Harmonized Commodity Description and Coding System (HS) category for cabbages and lettuces - HS070511 – from EHDA data is made difficult by the lack of reference to any of the versions of HS. There are more than twenty categories in the EHDA data mentioning either 'cabbage' or 'lettuce'. Using the categories 'cabbage lettuce', 'cabbage lettuce', and 'cabbage and lettuce', and using data from international data sets as well, produces quite sharply contrasting pictures of the level and trend in exports (Figure 6).

There are further complications with the EHDA statistics. Their data set has no metadata. The division of products does not consistently follow the HS guidelines. Many categories of horticultural product overlap. Sometimes reference is made to the number of boxes exported or the brand of a product, while for other exports it is not even clear what product the EHDA refers to. Potential and current investors in the sector cannot consult the EHDA's web site to obtain up-to-date disaggregated statistics on the area planted, the volume produced and the volume exported for even the most important fruits, vegetables or herbs produced in Ethiopia

Figure 9. A salad of estimates: trends in cabbage and lettuce exports according to different sources



Source: Authors' calculations

3.2 Resources/Inputs

Complications in access to land, water and electricity featured repeatedly in interviews with the owners and managers of agricultural export firms in Ethiopia as major constraints holding back plans for expansion. But for none of these inputs was there a simple form of scarcity. There were even contradictory signals of abundance and scarcity. For instance, in the Upper Awash Valley some claimed there was plentiful water and land but for others there were pressing shortages. A mix of policies and politics lay behind the ways these input issues constrained output. Other evidence confirms the primary significance of these constraints. Thus, a study of the Ethiopian Investment Commission (Sutton, 2018) found that the most common issues brought to the commission (by all medium and large enterprises) to resolve were to do with land and electricity supply.

3.2.1 Land

Land is the most obvious constraint for many investors. It affects some more than others – because of where their investments are and because of the requirements of production; for example, generally growing roses or ornamental cuttings requires less land than a vegetable exporting enterprise. Sustaining a viable vegetable exporting business requires field rotation. For this reason, and also to ensure a high enough throughput of harvested crops to make it economic to build a modern packhouse (with all the High Care Facilities required to meet international market standards), a firm needs at least 500 ha and possibly up to 1,000 ha. Vegpro, perhaps the largest horticultural enterprise in Kenya, produces about half of its horticultural exports on its own 7 large farms in Kenya, but has expanded to invest in a farm of over 1,000 hectares in Ghana.[13] A number of the newer enterprises in business left the horticultural market in 2013/14 because they could not achieve a viable size.

[13] Matchmaker Associates, 2017.

One way some firms try to address the scale problem – if they are not able to secure direct access to more land – is to develop outgrower schemes. Interviews suggested that commitment to outgrower schemes is a strategy undertaken half-heartedly because it is not possible to expand land directly under production, and that the rhetoric of 'corporate social responsibility' and 'sustainable development' or engagement with 'the local community' is attached to make a virtue of a necessity. One Ethiopian horticulture producer, for example, told us that working with outgrower schemes is 'the only way to live here'. The actual experience of outgrower schemes in the areas where we carried out research has been disappointing. Often outgrower schemes are set up just beyond the boundaries of a large investor farm and are designed to create a kind of protective moat around the core business. Especially in the wake of large scale political protests and attacks in 2016 (see below) firms like the Upper Awash Agro-Industries (an investment by Sheikh al-Amoudi) have not only installed well-armed security details on farm but have handed over land on the periphery of a large estate to 'local youth' to farm.

It is not surprising, then, that land is cited as the single most important constraint. One senior business manager of an Ethiopian owned horticultural exporting firm, a man with a long experience in the association of horticulture producers in the country, stated emphatically that access to and administration of land is a more important constraint on the expansion of horticultural exports than access to subsidised credit, tax breaks, import costs or delays, foreign exchange access or any other issue. The Chairperson of the Ethiopian Horticultural Producers and Exporters Association (EHPEA) agreed and said that land is the 'single biggest constraint'. Others too confirmed the land issue as a major one they faced. One or two firms have been particularly adroit in acquiring additional land through distress sales or defaults, managed by the Development Bank of Ethiopia. But even these firms wanted and were finding it impossible to get more land near their farms, especially when these were farms near Addis and in Oromia. The government is keen to side step these problems by opening up new horticulture and floriculture production zones, e.g. near Bahir Dar. But established investors in the sector are unconvinced: there are unresolved problems with the pH level of soils in the selected area and road transport costs are higher. Ethiopian investors argue that foreign investors are more likely to be attracted to Bahir Dar because domestic investors usually have families and want the better schooling available in Addis Ababa.

The state technically owns all land in Ethiopia but access and use is regulated by federal and regional authorities and also involves, often, negotiating compensation agreements with people who previously laid claim to land. Some investors argue that the level of compensation itself is not a big problem: but either people accept compensation and then later raise complaints and new claims, or compensation is agreed but the regional authorities block land transfers, perhaps because they are themselves ins search of financial inducements. So there were a number of complaints made to us about the Federal and the Regional Land Distribution Committees. A Dutch farm manager in the cuttings business made detailed plans to expand on 10 ha of land adjacent to the farm he ran. The plans were 'scuppered by woreda officials' but the land itself

continues to be unused for any productive purpose.[14] Differences between state institutions cause additional uncertainty. A herb-growing farm near Hawassa, for example, is anxious about the effect on land availability (and labour costs) of the new industrial parks on the edge of town. The government had signalled that it would help the firm to relocate but this assurance was foundering on differences between levels of government.

3.2.2 Water

Confusion between different levels and agencies of government also adds to the ways in which water becomes a particularly fraught resource. In the Rift Valley, and particularly the Upper Awash Valley, where most of our interviews took place, there were varying views on the extent to which water is truly scarce. Water is extremely cheap, and that is one source of attraction to investors, but investments to ensure its sustainable distribution are not being undertaken by government agencies at different levels. And there is rising awareness that the uncertainty of water availability is becoming a larger issue affecting productivity and there is clearly rising friction between users. Friction among users and regulatory uncertainty, in a context of expanding cultivation and of climate change and extreme weather events (above all, El Niño), is confirmed in other recent research (Parker et al 2016). 'Historically, Ethiopia's investments to reduce the negative impacts of hydrological insecurity and harness its water for power, food production, industry, livestock and improvements in health and livelihoods have been limited' (ibid., p.13).

Little seems to be being done effectively to manage competing demands and rising tensions around water access and usage. Some agribusinesses in the Upper Awash Valley complain that the authorities are favouring influential smallholders and the state owned sugar company. They claim that the large state owned farm wastes most of the water withdrawn by using inefficient overhead sprinkler systems. The federal government is promoting horticultural exports while the Oromia regional government is promoting its own smallholder irrigation projects producing for the domestic market 'with no reference to upstream and downstream users' (ibid. p. 20). The most blatant example of favouring production for the domestic market rather than exports is the plan to triple the area under sugar at the Wonji estate while, downstream, the Upper Awash Agro-Industry Enterprise - a large part of the huge former state owned agribusiness in the valley - faces water shortages that may limit its ability to expand exports.

Firms in the valley are dealing with the water issue in different ways. Some enterprises claim to be going to considerable lengths to store, conserve and efficiently manage water and, for example, to regulate their own use to free up access some days and times each week for local smallholders. But others appear to find it difficult to persuade their owners or financial backers to invest enough in efficient water management. Yet yields of high value export crops like passion fruit, grown in one part of the valley, are sensitive to variability in water inputs. The unclear

[14] A *woreda* is a third level administrative unit, smaller than zones and larger than the smallest unit, the *kebele*.

institutional and policy management of water stokes local complaints. For example, one foreign investor farm manager is convinced that smaller local capitalist farmers with 25-50 ha are bribing *Woreda* –level officials to divert water from large export schemes to their own onion fields and that local police have been turning a blind eye to vandalism of investors' irrigation gates.

One of the largest cut flower exporters in Ethiopia, Dümmen Orange, also lamented the lack of any infrastructure investment in rainwater collection facilities. There is clearly large potential for this since the area (within the Rift Valley) averages 700 ml of rainfall per year. Not only would this reduce the need for costly water treatment investments, it would improve the volume and reliability of the water supply as well increasing the range of lands that could become viable sites. Investments in rainwater collection would likely increase the profitability, output and productivity of investments, all of which would increase the contribution to the already significant contributions to net foreign exchange and employment the sector already makes.

3.2.3 Labour

Firms commonly cite labour issues as a constraint on expansion. Owners or managers of domestically owned and international firms operating in low-income countries are wont to complain about the discipline and reliability of the local labour supply. This has very much been the case in Ethiopia. A common complaint in the floriculture business since its inception was the high labour turnover rate (Gebreeyesus and Sonobe 2012). This was often blamed on young women being lured off the flower farms by the dangerous promise of earnings from domestic service in the Middle East. At one point the government banned labour migration to the Middle East, though later it relented. More recently, high labour turnover rates have been observed and puzzled over in the new garment factories in the industrial park in Hawassa.

Respondents in interviews carried out for this study offered mixed views on this issue. Labour turnover was certainly an issue for some, though the advantages of competitive labour costs still seemed to outweigh this. On one farm, employing 1,200 people, 95 per cent of them on permanent contracts (and of these 70 per cent are women), the management replaces around 400 every year: 'about 200 go off to the Middle East or go off sick or have to look after their children and about 200 we kick out'. But perhaps the most striking evidence came from large international firms based along the road south from Adama towards Ziway. Asked if high labour turnover at one very successful, large flower producing enterprise was a constraint on productivity, profitability, and expansion, the manager dismissed the question. The farm has no problem hiring 2,500 seasonal workers and many of the same people return year after year for the peak season. 'When I arrived', said the manager, 'everyone wanted to leave'. But now there is a functioning clinic on site, 700 of the workers are members of a rotating credit scheme run by the company, and the basic wage rate is relatively high - 1,200 ETB/month (plus free lunches, transport to and from work, and medical cover). The manager of this company said that these conditions were pretty much the same 'along this stretch of the road' among other agribusiness employers; and claimed that pay was higher than in the new Hawassa industrial park and in the factories around Debre Zeit (Bishoftu).

This manager had also built a crèche for the children of workers on the farm, whose facilities were shared with another foreign owned flower firm nearby. That contrasted with the interference from local authorities that another farm manager had had to deal with when proposing to build a crèche at the farm he ran in the Upper Awash Valley. This businessman had wanted also to set up an on-site clinic and needed a licence to dispense medicines. The licence application was rejected at zonal level. The consequence was that he had to spend ETB1.4 million on medical costs for workers to be referred to and travel to and from a clinic in Adama. He was sure that having a crèche and medical clinic at the farm would help reduce labour turnover.

A number of agribusiness managers had had to fend off political interference in their hiring practices. This included receiving anonymous emails strongly advising a firm to hire 'our people' for finance officer jobs (rather than people from other Ethiopian regions). It also included one farmer finding that woreda officials had placed selected workers on his farm without his knowledge and whom he would not himself have hired.

Overall, the evidence suggests that while of course there are labour 'issues' these are not decisive in investing in Ethiopia or succeeding as a business and that there are clearly things businesses can do to make working conditions more attractive, without threatening their profitability, to help ease labour supply constraints.

3.2.4 Energy

Water and energy are intimately linked in a country where the great majority (more than 80 per cent) of energy is generated by hydroelectric power schemes on dams. The link is dramatized by the fact that, after poor rains, the 300 megawatt hydropower plant at the Tekeze dam (in Tigray) had to shut down for two days (ODI 2016: 15). Irrigation demand now trumps energy generation requirements at the Koka Dam in the Rift Valley: dry season irrigation outflows from the dam aggravate silt levels in the dam, which reduces storage capacity and can damage hydropower turbines (ibid: 21). Meanwhile, one farm manager explained to us that frequent power outtages and power surges play havoc with the maintenance of irrigation pumps, raising costs beyond just the need to stock and use generator fuel.

Grid electricity is cheap in Ethiopia. At 2 cents/kilowatt it is cheaper than anywhere else in Africa (one farm manager reported electricity costs of 20 cents/kW in Uganda, for example). But power becomes fourteen times more costly the moment one has to use a generator, so agribusinesses, like other firms in Ethiopia (power being cited in most surveys of firm constraints), are perennially frustrated by unstable power supply. As the manager of a farm producing herbs on the outskirts of Hawassa put it, the unpredictability of the power supply has got worse: 'we can manage but please tell us it's happening!' This man also said that running a generator costs the same as running three tractors. When there are diesel shortages for up to ten or twelve days, the problem becomes even worse.

3.2.5 Foreign exchange

At the fast rates of growth experienced in Ethiopia for over a decade the thirst for imports of all kinds, including imports of some of the consumer goods such as tomato paste, fruit juice and wine that agribusiness is producing domestically, has been hard to quench. Profits can be earned by supplying the buoyant domestic market with a variety of imported goods, and/or by exporting agricultural, floricultural or other commodities. If an enterprise is officially recognised as contributing to exports, its owners are permitted to acquire foreign exchange more easily than other capitalists, in the hope that they will use their foreign currency accounts to import the inputs needed to expand export production. But it is possible, indeed very likely in the case of some coffee traders, for example, that capitalists can earn higher profits by supplying the domestic than the export market, partly because of the persistent overvaluation of the Birr and partly because the domestic market imposes fewer phyto-sanitary barriers and will accept lower quality products. It appears to have become worthwhile to 'pretend' to be an exporter of an uncompetitive product, for example beans from Merti farm, in order to ease the farm's access to foreign exchange.

There may be also be precautionary and other motives for holding foreign rather than domestic assets, for attempting to accumulate foreign exchange and to avoid strict government controls on how and when these funds are disbursed. These motives probably explain some of the data on the scale of mis-invoicing and illicit financial flows from Ethiopia (Kar, 2013). In this context, and fearful of the political consequences of shortages of imported basic commodities such as cooking oil, the government is keen to use the National Bank of Ethiopia to retain controls over traders' and capitalists' free access to foreign exchange.[15] But some of their efforts to regulate access to foreign exchange have made it time consuming and more difficult for agribusiness exporters to operate efficiently, especially when changes in government regulations and National bank guidelines are rapidly introduced. As is the case for coffee exports, it is not clear that the Ethiopian state has the capacity to control and closely regulate all trading activities that break the law or evade the myriad regulations. Our conversations with the most successful agribusiness managers did not suggest that they were unable to overcome the delays and other difficulties in acquiring foreign exchange for their imported inputs. But it could be argued that more effort should be made to encourage and subsidise exports, rather than to micro-regulate access to foreign exchange.

3.3 Infrastructure

3.3.1 The tarmac ends where the sugar fields stop

The Ethiopian government, largely from its own funds but also with external loan support, has spent billions of dollars on expanding the road network since the late 1990s, though all weather

[15] Growing difficulties in obtaining foreign exchange and a widening gap between the official and unofficial exchange rate have recently been reported (Capital, April 30th 2018).

roads still cover less than a third of the estimated required road network.[16] Expenditure has focused on building new roads and upgrading existing roads. This is combined with other major transport infrastructure investments, including the dry port at Mojo and the new Addis-Djibouti railway that began operations in 2018. But the state of transport infrastructure, roads above all, continue to be a major constraint on sustained economic growth and structural change. The new, Chinese built three lane highway reaching southeast from Addis Ababa has relieved some of the pressure on the old road heading towards Djibouti, a road that might be called the Balance of Payments Highway given the long lines of trucks congesting the traffic and edging slowly uphill laden with imported goods towards Addis. But there are other roads – Balance of Payments feeder roads – that are also significant economically but that have not received the same level of attention. Investments appear to have been focused on trunk roads, but only about 10 per cent of Ethiopia's rural population lives within two kilometres of an all-weather road. In addition, the level and quality of investment in road maintenance has been criticized (Foster and Morella, 2011): one estimate is that only about 30 per cent of Ethiopia's rural roads are in 'good condition' (Iimi et al, 2017: 8).

A glaring example – though not the only one – is the road heading northeast off the main road south from Adama and running through the Upper Awash Valley, past the now privatised large commercial farms that used to be part of a massive state owned farm and, before that, landholdings of the emperor. Along this road is one farm that claims to supply 60 per cent of the entire demand within Ethiopia for fruit. Other farms produce passion fruit or ornamental plant cuttings for export. And at the western end of the road, after and around a bathing resort, is the large Wonji sugar estate (state owned). All weather surfacing of the road stops where the sugar fields end. Beyond the (inefficient) sprinklers of the sugar estate, the road is ungraded and rough and particularly vulnerable to damage from heavy seasonal rains. All the large agribusinesses along the valley complain about the condition of the road and wring their hands that the authorities have not delivered on a promise several years old (and incorporated in GTPI) to grade the road.[17]

Prevarication on grading and resurfacing the road suggests a failure to prioritise an area with very high potential for generating foreign exchange and employment opportunities. The effects are more than mere inconvenience. Precisely because of the technical requirements and just-in-time production schedules of high value agricultural exports discussed above, infrastructure becomes a core issue. 'The road is everything', one production manager at a fruit processing plant insists: the poor condition of the road raises maintenance costs substantially for the 57 vehicles and ten large trucks the firm owns. Another farm packs its main output into aseptic aluminium-lined bags on site before these are sent by truck for transport to the Netherlands. The bad road shakes up the bags, wears through the lining, and causes fermentation: the firm estimates a regular loss of about

[16] UNDP (2014: 83) stated that in the 16 years up to 2013 Ethiopia had spent $7.1 bn on road construction, 77 per cent of which was from internal funds and 23 per cent from external grants and loans.

[17] The government's main planning documents in recent years have been the Growth and Transformation Plan (GTP) I (launched in 2010/11) and GTP II (launched in 2015/16).

12 per cent of the value of these exports thanks to the condition of the road. Another farm manager in the valley claimed that after the Federal Roads Authority had delegated responsibility to the Oromia roads authority, the regional authority had not delivered on their pledge to improve the road: this despite the fact that the road has been surveyed some ten times in the past fourteen years.

The road has other economic costs too. Farmers in the Upper Awash Valley routinely complain that it is very difficult to attract good, qualified staff for senior posts. One reason is that it takes too long to travel even to Adama, let alone to Addis, where the better schools are for their families. For the staff they can attract, farms tend to run regular shuttles to Adama. Further, for one farm the state of the road meant that opportunities for co-location and productive clustering were missed. That farm had hoped a bottling company would set up a plant in the valley and there were negotiations; but reportedly, the bottlers pulled out - largely because of the road.

3.4 Rules and regulations: learning to swim without armbands

There have been substantive changes in institutions responsible for promoting the industrialization of the Ethiopian economy in the recent period of rapid economic growth, changes that at times confound expectations of 'path dependence' or entrenched 'culture' or indeed the neo-patrimonialism that is supposed by many to dominate African societies. A good example is the development of the Ethiopian Investment Agency, and then its successor organization the Ethiopian Investment Commission (EIC). Not only has the EIC changed its practices in ways that have clearly become more efficient (Sutton, 2019) and very much appreciated by many of the agricultural investors that we spoke to; but also its effects have spread beyond the EIC to the governance of the nascent industrial parks and to the operation of the National Export Council.

But long-established repertoires of regulatory complication endure; and new difficulties have lately arisen too. Firms have to spend far too much time on 'non-core' business thanks to what they regard as an 'institutional quagmire'. For some, this is a function of the government shifting from an earlier largely informal approach to a more formal set of rules but 'overshooting' and not working out how new rules would operate in practice. 'There is a disconnect between levels of government: those at the top "get it" but lower down they don't'. Others see it more as a function of different levels of bureaucracy, with lower level officials taking obsessively concerned to keep to the very letter, dotted 'i' and crossed 't' of the regulations: 'the laws are good but their implementation is terrible'. Others sense political tensions manifest in conflicting interpretations of rules and in contradictions between rules set at the centre and those followed (or ignored) in the regions. And on occasion the problem is a more mundane one of delays that could be avoided through making a corrupt payment.

A particularly striking example illustrates some of these issues. To prevent soil exhaustion some farmers need to use – and therefore import – agricultural chalk. It is cheap. The transport costs are about three times the material cost. One enterprise needed to import a consignment of the

chalk – in a mixed container also holding a tank for storing water on the farm - and told the supplier that they would have to have English labels (as specified in Ethiopian regulations). There was some negotiation but they agreed. The order went in in June 2017 and five weeks later it was shipped to Djibouti. But on the container it had a label with a brand composite name a little different from the specific product name that had been on the order. The container did, however, specify the exact ingredients and composition, which was identical to the other brand. The Ministry of Agriculture said it was the wrong material and for six months would not release the container. The firm had to pay for storage and this doubled the cost. Meanwhile, the water tank was badly needed but the firm also could not get this released. As of January 2018 they still did not have it. 'If the papers are not 3000 per cent correct, it is stopped.' The default position is red rather than green as it would be in the Netherlands.

Processing work permits for key senior staff hired from overseas, including (or especially) experts recruited from other African countries, takes a great deal of time and effort and the relationship between these investors and the Home Affairs department is not streamlined. Similarly, there are complaints that the document registration agency is over-zealous in demanding, for example, that everyone present at a meeting must attend the office to sign the minutes, and that if the minutes include an agenda that does not exactly match the template the agency uses they have to be done all over again.

A particular problem concerns the governance of investment. Investors appreciated the improvements in the way the EIC had come to deal with issues raised. But then the government devolved some responsibilities away from the EIC down to the Oromia regional government investment office. This office was thrown in at the deep end, as investors put it, and officials could not swim – indeed, they 'had no armbands'. So on the one hand there has been institutional development and formalization – a step forward; but on the other there has been devolution and at least for a while two steps back.

The way one farm manager, of a highly sophisticated global leading company, put it was that in Ethiopia it 'is very easy to start all this – land is cheap, there are tax holidays, water is cheap, energy is cheap, it's safe. Then it gets difficult. You never see a *full* list of requirements from officials – it's always one step, resolve it, next step, deal with it, next step, wait… The rules are unclear. New rules are introduced without clarity – e.g. they introduced new fertiliser regulations without telling us [other investors raised this same example]. In Kenya it is more predictable. There's less corruption in Ethiopia but it's more unpredictable.'

3.5 Easy/Difficult

This comment, that it is very easy to begin with but then gets more difficult, captures something at the heart of the political economy of Ethiopian government efforts to secure rapid structural change. Just as achieving rapid growth episodes may be relatively easy but it is more difficult – but more important – to protect an economy against growth reversals (Pritchett, 2016), so there are often relatively easy and relatively difficult stages in particular sectors or economic activities.

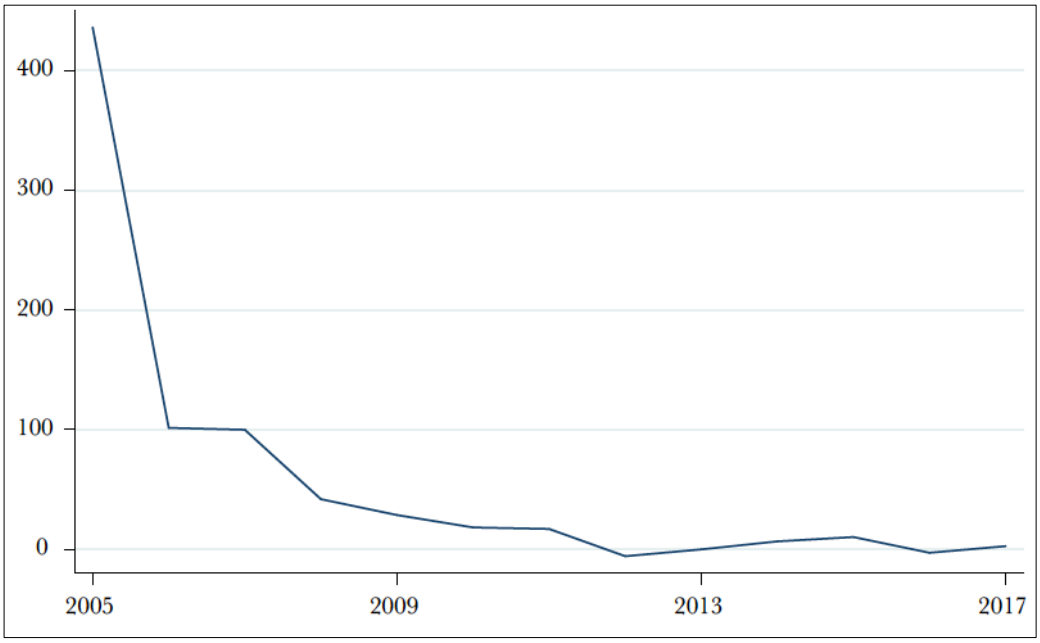
Hirschman wrote long ago (1968) about the easy and difficult stages of import substitution industrialization. Though not always for precisely the same reasons, the insight remains relevant now.

One example is that it was fairly easy to set up a floriculture sector *ab initio* in Ethiopia. The state, owner of all the land, could grant concessions of cheap land in water abundant areas within close proximity to Bole international airport, soft loans from the state-owned DBE, income tax holidays, loss rescheduling provision and removal of tariffs and duties on capital goods, spare-parts and inputs. There were abundant supplies of cheap labour. The state owned a relatively well-managed airline, Ethiopian Airlines, willing to carry cut flowers the short (compared to competitor countries) distance to major markets in Europe. Initially promotion and support for the sector were undertaken by a special council under the prime minister's office; but later a lead agency (EHDA) was set up aiming to support the sector under a centralized system. Moreover, the sector received continuous international support especially from Dutch development cooperation that subsidized investors, encouraged institution building and provided firm level training.

Until 2007/8 the sector enjoyed remarkably rapid growth with over 70 operational firms cultivating 922 hectares of land, which was more than fivefold growth compared to 2004/5. In the same period, the sector generated an average of USD 53 million per year and created direct employment for 34,720 people (Melese 2017a). In 2015, the total cultivated land reached 1,623 hectares and 66 firms exported 50 million kilograms of flowers, generating US$ 225 million foreign exchange.

After 2008 growth slowed dramatically (Figure 5), partly due to the global financial crisis that affected the global floriculture trade (Rabobank 2016). The total number of flower firms in Ethiopia peaked (at 86) in 2006/7 but the following years showed a considerable drop as many domestic firms ceased to operate. The number of operational domestic firms fell from 38 in 2006/7 to 14 (including one joint venture) by June 2016, whereas the number of foreign firms increased from 26 to 66 in the same period (Melese, 2017: 1). Several of the exiting firms, especially the domestic ones, had joined the sector with little knowledge of or commitment to floricultural exporting. Thanks to the investment incentives and the 'government brokers' who provided ready-made feasibility studies, several firms opportunistically took advantage of the available finance and access to foreign exchange to pursue other businesses - focused on the domestic market rather than exporting - or left the country. Only some of the domestic firms that established turnkey, over-sophisticated greenhouses accumulated significant production capabilities; few were able to build the strong management and market relations needed to cope with shocks in the global market (ibid: 9). One consequence is that, as in Kenya (Moran, 2018: 5), a large and probably increasing proportion of Ethiopia's floricultural exports is produced by a tiny number of very large scale foreign-owned firms. Below we discuss a number of other examples where both private and state owned firms in Ethiopia have run into the harder phase.

Figure 10. Growth rate of exports of cut flowers from Ethiopia, 2005-17 (annual percentage change in volume of exports)



Source: ITC Trade Map, 2018

There is a tendency not only to imagine that investing to build a factory achieves an advance to the cutting edge of modernity and structural transformation, but also to believe that there are few problems in investing in the old fashioned, 'simple' techniques of producing agricultural commodities. We suggest that building imported turnkey factories is often 'easy' and can rapidly be achieved; it is far harder and far more technologically complex to ensure that farms supply the throughput necessary for the factories to operate efficiently at full capacity.

Part of the difficulty in achieving consistent growth in agricultural throughput is that this requires massive and sustained in investment in R&D – to alleviate disease outbreaks – and in training to produce the farm managers, irrigation engineers, plant pathologists, vets, etc. required. The policy neglect of these investments is an obvious constraint on the expansion of production and exports. For example, the newly installed tomato processing machinery, producing the domestically popular Merti brand of paste in a small sachet form making it affordable to a low-income market, has *never* operated at full capacity. This is partly because only a small proportion of the company's available land can be planted with tomatoes as the result of long-standing problems with parasitic weed infestation by *orobanche*. Efforts to overcome this problem at the nearby Melkassa Research Centre are hampered by the fact that Ethiopia's stock of Agricultural Science Technology and Innovation research expertise is far smaller (and younger) than in most Sub-Saharan African economies, as well as by the high proportion of its funding devoted to wages and salaries rather than other research costs (Alemu et al, 2016: 8-9; ASTI, 2018).

There are plenty of other examples: as one farm manager put it, 'under capacity bites like a crocodile.' Among them, we have already noted above the relative ease in importing juicing and

evaporator machinery (from Parma) but the considerable difficulty, technically and politically, in securing a reliable throughput of passion fruit. On a larger scale, there has never been much difficulty in Ethiopia in setting up tanneries and leather goods producing factories – including recent large-scale foreign investments by the Chinese shoemaker Hua Jian and the Pittards factory supplying Costco with gloves. But there is protracted and deep capacity underutilization in the sector (USAID 2013; Oqubay 2015). Neither the industry nor the government has managed to resolve the long-standing difficulties in securing a reliable supply of good quality hides and skins. Hides and skins are a by-product of the meat industry and constrained by the organization and level of demand in that industry; poor animal husbandry and widely dispersed shoat flocks and cattle holdings lead to poor quality and small hides and skins. Although Ethiopia has the largest livestock population in Africa and one of largest ten in the world, the off take is low (7 per cent for cattle and 35 per cent for shoats). With the surge in textile production in the country's new industrial parks, a very similar problem is affecting cotton production. Textile factories have been built, there are some 20 spinning mills in the country and as of early 2018 there were around a dozen further spinning mills in the pipeline. But the factories continue to depend on imports. And existing spinning mills are operating at half capacity. Imports, duty free and produced in countries with substantial subsidies for cotton growers, were rising to new peaks, while cotton output in Ethiopia has shrunk and quality is not good enough for the high grade demand in the new textile and garment factories (USDA 2018).

3.6 Development on speed: the principle of the hiding hand vs. the principle of the throttling hand

An outburst of protests and violence in Ethiopia in late 2016 interrupted fieldwork for this study. Political protests, triggered by opposition to a planned expansion of the land area covered by Addis Ababa, sparked direct attacks in particular on a number of businesses owned by foreign investors in Oromia. These included the mobilisation of a large crowd of young men in the Upper Awash Valley, who descended on the AfricaJuice Tibila farm and laid waste to its buildings and equipment, trampling pills from the clinic's medical supplies into the ground, setting fire to buildings, damaging vehicles, looting some machinery, but not harming the main processing equipment. At least part of the same group then moved further down the valley towards other farms: at one farm that was also part of our study they arrived at the gates but were talked down. Perhaps the farm managers were successful in negotiating with the protesters because the managers had a much more sustained record of offering decent employment opportunities to young people. The exact reasons why one farm was so badly affected and others, through threatened, avoided direct damage are complex and beyond the scope of this report. But the violence, and the state of emergency and ongoing instability that followed, serve to underline the fundamentally socio-political dynamics behind the various constraints discussed above. Tensions over access to land and water, a deep-seated structural problem in Ethiopia's political economy, and a possible deflective scapegoating of foreign investors who could be associated with the central state all combined to fuel the instability and the uncertainty faced by investors.

Clapham (2017) argues that throughout Ethiopia's history the highlands have been the source of political power and the more peripheral lowlands the source of economic reproduction, leading to enduring political tensions.[18] This would seem to characterize well the basic dynamics in lowland areas of Oromia. Oromia accounts for a large swathe of southern Ethiopia and for the largest single ethno-linguistic grouping in the country. It has been the main source of political protest against the EPRDF since 2016. Recent tensions are closely related to the policies of the EPRDF and to what might be called the 'political economy of being in a hurry' in Ethiopia. The EPRDF, notably under the late Prime Minister Meles Zenawi, hitched the wagon of its political survival and legitimacy to the star of rapid economic development (De Waal, 2013: 473). A determination to bring about rapid economic growth and structural change, as the source of legitimacy, gathered momentum in the wake of the 2005 elections. The EPRDF suffered a major challenge to its dominance in those elections, whose results were cancelled and which were followed by a spate of imprisonments and a state of emergency. The government shifted strategy and pushed for faster economic change. But in a way what followed was a race between the pursuit of development and the challenge from rising expectations that came with a demographic bulge, wider access to education, a surge in construction of universities around the country, infrastructure improvements, and rising inequality.

In the course of this drama, two principles or logics have come to be at loggerheads. On the one hand, Hirschman's principle of the 'hiding hand' has been in play. Hirschman (1967), writing on large-scale development projects, argued that sheer optimism led planners to embark on such projects but that the optimism that was necessary to get a project off the ground 'hid' knowledge of the inevitable complexities and obstacles to successfully implementing the project. Once the project was underway and began to reveal extremely challenging problems, officials were often able to find creative ways to address those problems. Hirschman argued that had they clearly anticipated the extent of the difficulties involved, planners would never have approved the project in the first place. In this sense, the 'hiding hand' of over-optimism created a situation in which engineers, planners, and policy officials were eventually forced to develop capabilities they otherwise lacked. On the other, throttling hand, another principle may be in play. A state that races to attract investors by offering land concessions at fire sale prices, that commits huge sums of public expenditure to infrastructure upgrading and to finding the quickest way to complete toll roads and railways, and that flags up that it will build a 'Grand Ethiopian Renaissance Dam' (the GERD), the largest hydro-dam scheme in Africa (self-funded), all with a somewhat shallow depth of bureaucratic capabilities and an asphyxiating balance of payments constraint, risks choking off the source of sustained growth, the spread of linkages, and political legitimacy.[19]

There is no law determining the outcome of the interplay of these principles. We have found evidence (in horticultural air-freighting, for example) of both a remarkable 'adaptive capacity'

[18] See also Markakis (2013).

[19] The GERD was expected to be finished in 2018 but this has been put back. One example of unexploited scope for linkages is in the construction of the Addis Light Railway. Basic stone tile slabs lining the way into the underground section of the railway were shipped from China when they might without difficulty, and only a slight delay, have been quarried and made in Ethiopia.

(Giezen et al 2015) and institutional learning and creativity but also evidence of stifling blockages. The challenge for policy makers – and for those outsiders keen to support them – is to work out ways in which the dynamics of the hiding hand may get the better of those of the throttling hand. Our policy conclusions, below, are intended to provide some basis for policy and institutional design in support of this cause.

One example involves the fiscal regime for foreign investors and its implications. The tax regime is extremely favourable. Investors in horticultural exports can be exempt for up to ten years from paying business income tax and can benefit from exemptions on customs duties on imports. But one implication is that investors may effectively have to act like a state in the area around where they operate. The central state does not have sufficient fiscal resources fully to support the provision of schools, health services, and energy. Investors often find they are encouraged to contribute to the costs of provision of local school buildings and services, to health facilities, and to other local services. They and their employees may also feel obliged to make contributions to the GERD. In a way this is in their interests. It helps them to establish local legitimacy if they are associated with improvements in school buildings and so on. But not all investors are equally good at behaving in state-like ways. This may lead to higher variation in the stability of performance and in vulnerability to local political challenge. That in turn is no foundation for a coherent strategy to maximise foreign exchange, employment, and linkages to the domestic economy.

There are two other implications concerning the fiscal regime that affect investment prospects in horticulture. First, the absence of significant taxation lessens the compulsions to develop organised and state-business relations to solve collective action problems the sector faces such as the need for more infrastructure or domestic technical and research capacity.[20] Second, the tax incentives for domestic actors to invest in horticulture face stiff competition because of high profits available in urban real estate in a context of growing urban demand and negligible property taxation (Goodfellow, 2017; Gebreyesus 2019).[21] Thus, the speed with which the government has attempted to set up several sectors via generous tax holidays now means that far more coherent production strategies beyond tax incentives will be required to extend horticulture exports and address the more difficult stages of its expansion.

[20] In the case of Mauritius, for instance, export taxes on sugar, the main export commodity in the 19th and most of the 20th century, had several positive effects on state-society relations and in increasing the productive capacity of the sugar sector (Bräutigam, 2008). The export tax encouraged the private sector to organize and to build their capacity to interact with the government over time. Also, it helped both the state and society to solve collective action problems they faced in building skills and in supporting research on sugar.

[21] 73 per cent of investment from the top 10 domestic investors between 2006 and 2010 was in real estate or construction (Goodfellow, 2017: 558). And 60 per cent of all investment by Ethiopian diaspora in the period between 1994 and 2014 was in real estate and related services (ibid: 559). The diaspora invested four times more in this sector than in manufacturing, despite numerous official incentives in place for the latter (ibid: 559).

Conclusion and policy principles

The findings of this research, and the analytical framework that these findings provoked us to develop, suggest that policy makers may need to reconsider priorities for resource allocation in Ethiopia (and elsewhere). We have highlighted the importance of designing economic policies that not only generate rapid growth but also protect against growth collapses. The balance of payments constraint is perhaps one of the most powerful influences affecting prospects for achieving these objectives. And relaxing this constraint involves, above all, generating a rapid rate of growth of foreign exchange earnings. At the same time, a fundamental objective of economic policy in developing countries like Ethiopia is and has to be to generate a rapid rate of growth of wage employment.

Pursuing these objectives involves decisions about allocating resources between activities and decisions about how to sustain dynamics within evolving sectors rather than merely how to stimulate the initial set up of a sector or a new set of activities. A common principle on which to base resource allocation decisions is the distinction between 'sectors', on the assumption and historical evidence that there are particular gains from the rapid expansion of, above all, manufacturing industry. This has been the basis for industrial policy design. Industrial policy for developing economies has received renewed attention in international policy and academic circles. It has been championed by proponents across a broader range of intellectual and ideological backgrounds than was previously the case. But at the same time there have been rising fears that this is too late, that industrial policy cannot, in the face of 'premature deindustrialization', secure the development gains that it did in the past.

Our study offers a way ahead. It suggests that policy officials and donor agencies need to think more in terms of distinctions among economic activities than between traditional sectors. This is because the distinctions between sectors have largely broken down, the relations between sectors have deepened, and the variation within each sector has grown to be larger than the variation between them. More than this, the evidence (internationally and from close observation in Ethiopia) points to the scope for the misallocation of resources based on a form of category error – the mistaken assumption of development gains on grounds of categorical distinctions that are no longer helpful.

Thus, the principal criteria that ought to guide the setting of priorities are whether a given activity has a proven potential to generate fast growth in export earnings and in wage employment (direct and indirect). These criteria may be used to influence the choice of activities given special tax incentives, of how to select between water uses and access to land, and which infrastructure spending to prioritise.

But selective incentives – cheap land concessions, tax exemptions, access to foreign exchange, guaranteed water rights, and so on – can only be effective if combined with the discipline of 'reciprocal control mechanisms' tying incentives to a clear record of strong performance in export markets. This in turn requires effective and regular monitoring. Indeed, one of the highest

priorities for policy in Ethiopia has to be investment in the more regular collection of reliable data on economic activities that can support structural change, growth, and protection against growth collapses.

In Ethiopia, there has been a commitment to new industrial endeavours, especially the promotion of an expanding number of industrial parks, whose benefits in terms of net foreign exchange earnings and wage employment are not yet clearly established. We suggest that officials should consider instead the gains from investing in activities with already proven capacity to generate significant foreign exchange earnings and wage employment opportunities at relatively low additional cost to the public purse: these activities are high value horticultural/agricultural exports, and promoting them involves a 'race to the top' (Moran 2018).

This would mean prioritising measures to overcome a raft of constraints holding back the expansion of high value, technically sophisticated 'industrial' agricultural exports and preventing enterprises undertaking these activities from proceeding from the relatively 'easy' early stages to the more 'difficult' stages of deeper productive success.

The key priorities here include the following. Government should push to the front of the queue for infrastructure spending allocations to repair and upgrade roads linking areas with concentrated potential for agricultural exports to major trunk roads. There needs to be a big push for the development of Ethiopian agricultural research and development capabilities (facilities and PhD-trained staff) in particular focused on export crops. The government needs to do 'political settlement' deals at various levels to ensure a progressive way of resolving land and water usage disputes so that local employment opportunities are maximised (and clearly understood) and so that foreign exchange gains are prioritised. The National Export Council, together with the Ethiopian Investment Commission, needs to be given authority to accelerate institutional changes geared to promoting foreign exchange and employment generating activities.

And policy officials need to give greater priority to the promotion of champions or star exporters. The evidence internationally (especially from Chile and Colombia and also from Kenya) suggests that successful integration into global horticultural value chains depends on a handful of 'export superstars' (Moran, 2018; see also Cramer and Sender 2015 on South Africa). There are empirical similarities between successful supply chain creation in manufacturing and horticulture in developing economies – success in both activities requires 'export superstars that are born big, start out as highly productive firms, and grow fast' (Moran, 2018: 3). Indeed, the increasing role of international standards (phyto-sanitary, quality, voluntary 'ethical' etc.) has only led to a greater concentration within horticultural production. The costs of certification are too high to bear for most smallholders. For example, in 2004 smallholders dominated Kenyan horticulture exports but as importer country standards became more rigorous, the smallholder share of export revenue fell by 2011 to less than 30 per cent (Moran 2018: 12). It is no wonder that interviewees for our study struggled with their efforts to promote smallholder outgrower schemes, which appeared to be more significant as a political gesture than a productive strategy. At the same time, Ethiopia's domestic fruit and vegetable market has been dominated by a huge

'Ethiopian' conglomerate owner with interests spread across many different sectors but without anything like the determination to specialise and upgrade of the Kenyan Vegpro (founded by an immigrant Asian family who had fled Uganda).

In other ways too the significance of industrial agriculture has escaped policy frameworks in Ethiopia. Thus, for example, horticulture firms (many employing 800-1,200 workers) cannot benefit from the support for soil analysis and fertilizer mixes through the well-funded Agricultural Transformation Agency (ATA), because this is focused exclusively on smallholder farmers. Yet these large-scale horticultural firms are at the same time not within the domain of industrial policy focused on leather, garments, etc. They have not received the same attention from government in, for example, setting up sector-specific institutes (as for leather and textiles) (Oqubay, 2015).

We have suggested that policy officials may want to revisit priorities for resource allocation and that there may be a trade-off between promoting industrial parks and promoting the deepening of horticultural exports. But there are important implications also from the research and analysis in this study and the design of policy for industrial parks themselves. First, we have argued that there is an important distinction between the easy and difficult phases of developing productivity in particular sectors and that policy officials need to pay more attention to this distinction. This point will apply just as much to the development of industrial parks – and seems already to be affecting the parks. Second, to make a real success of the industrial parks will require potential linkages to be realized between, especially, textile and garment factories to domestic raw material producers. The implications of our analysis have a strong bearing on any strategy to promote backward linkages from urban factory production to Ethiopian raw material input supply.

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