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Patterns of Growth and Structural Transformation in Africa

Trends and Lessons for Future Development Strategies

Peter Timmer Margaret McMillan Ousmane Badiane Dani Rodrik Hans Binswanger-Mkhize Fleur Wouterse African economies have sustained a solid pace of growth for nearly two decades. This unprecedented performance in the continent's history is a welcome change from the previous decades of stagnation and decline. So, how can Africa continue to accelerate economic transformation and broaden growth in the decades to come? Solid stewardship of the future development agenda requires a good understanding of the factors shaping the growth process across the continent. More than the average rate of growth, the nature and patterns of structural change or the extent to which individual economies are successfully moving labor and resources into activities with high and increasing levels of productivity, is a much better gauge of future economic performance.

The current recovery is masking serious future growth challenges that will have to be addressed for African countries to join the rank of middle-income economies. Two key issues are at the center of these challenges: (1) the modernization of smallholder agriculture and its integration into the fast-growing agribusiness chains that can capture the rapidly increasing demand for urban food, and (2) the renewal of industrialization strategies to promote entreperise creation and growth in the agribusiness and manufacturing sectors to raise the rate of labor absorption and productivity levels outside of agriculture.

This Thematic Research Note focuses on the process of structural change in Africa and other developing regions and draws useful conclusions for future development strategies among African countries.

Ousmane Badiane, Director for Africa, IFPRI

THE MATHEMATICS OF STRUCTURAL TRANSFORMATION

Peter Timmer

Structural transformation is the defining characteristic of the development process; it is both the cause and the effect of economic growth. Four quite relentless and interrelated processes define the structural transformation process: (1) a declining share of agriculture in gross domestic product (GDP) and employment, (2) the rapid process of urbanization as people migrate from rural to urban areas, (3) the rise of a modern industrial and service economy, and (4) a demographic transition from high to low rates of births and deaths. The final outcome of structural transformation is an economy and society where agriculture as an economic activity has no distinguishing characteristics from other sectors, at least in terms of the productivity of labor and capital, or the location of poverty.

Table 1 illustrates three alternative paths for a country's structural transformation. At the outset, industry, services, and agriculture contribute 20, 30, and 50 percent to GDP, respectively, and the share of workers in each sector is 9.7, 20.8, and 69.5 percent, respectively—fairly typical for a country in the early stages of development. In each sector, labor productivity is ranked third, second, and first, respectively, in terms of importance, so overall labor productivity for the entire economy is the weighted average, or 1.4. The economy then grows for 20 years, with industry growing at 7.5 percent per year, services at 5 percent per year, and agriculture at 3 percent per year. These growth rates result from sector-specific technological change on the supply side and differential demand patterns that reflect Engel's Law. The "simple math" of structural transformation shows what happens to the economy and labor productivity through 20 years of reasonably rapid growth.

Start (Year 0)	Industry	Services	Agriculture	GDP		
Output	20	30	50	100		
Share of GDP	20	30	50	100		
Number of workers	7	15	50	72		
Labor productivity	3	2	1	1.4		
Share of workers in total	9.7	20.8	69.5	100		
Sectoral growth rates (% per year)	7.5	5.0	3.0	4.5		
Contribution to growth in Year 0	1.5	1.5	1.5	4.5		
End (Year 20)						
Output	85	80	90	255		
Share of GDP	33.3	31.4	35.3	100		
Number of workers						
Path A	28	40	39	107		
Path B	14	24	69	107		
Path C	7	15	85	107		
Labor productivity						
Path A	3	2	2.32	2.4		
Path B	6.3	3.3	1.31	2.4		
Path C	12.7	5.3	1.06	2.4		
Share of workers in total						
Path A	26.2	37.4	36.4	100		
Path B	13.1	22.4	64.5	100		
Path C	6.5	14.0	79.5	100		
Contribution to growth in Year 20	2.5	1.6	1.1	5.2		
Ratio of labor productivity (wages or income) in the top quintile of workers relative to bottom quintile						
Start	2.55					
Path A	1.50					
Path B	4.02					
Path C	7.2					

Table 1. The simple (but implacable) mathematics of structural transformation

At an aggregate level, total GDP grows from 100 to 255, an annual growth rate of 4.8 percent per year. Despite the fact that each sector continues to grow at a constant rate, the GDP growth rate accelerates: it is 5.2 percent in the final year compared with just 4.5 percent per year at the start. If the labor force grows by 2 percent per year during this exercise, labor productivity in aggregate will grow to 2.4 (from 1.4 in the base year), which demonstrates a healthy growth rate of 2.7 percent per year.

Table 1 also shows three possible growth paths that encompass the modern development experience. Path A, following the basic logic of the Lewis Model, holds labor productivity *constant* in the industrial and service sectors as they absorb labor from the agriculture sector at the same rates as each sector itself expands. This labor-intensive path of industrial and service growth leads to the fastest structural transformation of the three scenarios and is so successful in pulling "surplus" labor out of agriculture that labor productivity in agriculture is actually higher in the end than in the service sector and only 23 percent lower than in the industrial sector. No country has actually managed a growth path with quite that much labor intensity, although the East Asian experience comes closest. Path C looks at the opposite extreme where labor productivity in the industrial and service sectors grows at the same rate as the sectors themselves. Thus, neither sector absorbs any new workers, and the entire increase in the labor force remains in agriculture. Because agricultural GDP is still rising faster than the labor force, labor productivity in the sector does rise slightly but only by 0.3 percent per year. This pattern is closer to the African experience. Not only is the absolute number of workers in agriculture still rising on this path, so too is the *share* of agricultural labor in the total labor force. Path B is halfway between these two extremes with labor productivity in the industrial and service sectors growing at half the rate of increase in sectoral output. The agricultural labor force (that is, the number of workers) continues to rise (from 50 at the beginning to 69 at the end). Labor productivity in agriculture increases by 1.4 percent per year over the entire period.

Figure 1 illustrates the dynamics of structural transformation. Although, it shows the share of agricultural labor in the total labor force and the contribution of agriculture to overall GDP—both declining smoothly until parity is reached when a country is "rich"—the actual relationship between the two shares depends critically on the pace of change outside of agriculture and on the labor intensity of those activities. Figure 1 also shows a basic but often-overlooked fact about the "failure" of agriculture to grow as quickly as the rest of the economy and thus to decline as a share of GDP and in the labor force: despite structural transformation, agricultural output continues to rise in absolute value.





Table 1 and Figure 1 emphasize the power, inevitability, and paradoxical nature of structural transformation. Even a narrow focus on agricultural productivity per se must be set within this transformation. The crucial point is that the faster the structural transformation, the faster the decline in the share of agriculture in both the economy and the overall labor force. The paradox is that, the faster the structural transformation, the faster rural productivity—proxied by rural labor productivity—rises (as in scenario A). This is true even though the rate of growth of agricultural GDP is the same in all three scenarios. The dynamics described above indicate that strategic efforts seeking to raise rural labor productivity and reduce poverty have to inevitably incorporate the broader structural transformation process and its requirements as the basic framework.

GLOBAL PATTERNS OF STRUCTURAL CHANGE

Margaret McMillan

Labor productivity growth in an economy can be achieved in one of two ways. First, labor productivity can grow *within* economic sectors through capital accumulation, technological change, or improved allocation of resources across plants. Second, labor can move *across* sectors—from those with low productivity to those with high productivity—and thereby increase overall labor productivity in the economy. We can describe the latter as the contribution of structural change to overall productivity growth. The contribution is positive (or, productivity-enhancing) if labor primarily migrates from lower to higher productivity sectors. It is considered negative (or, productivity-reducing) otherwise. The pace and nature of structural change over the period 1990 to 2005 outlined in Table 2 demonstrates that there are large differences in patterns of structural change across regions and that these account for the bulk of the differential performance between successful and unsuccessful countries

	Labor productivity growth	Component of productivity growth due to			
		Growth "within" economic	Labor movement "across" sectors		
		sectors	(structural change)		
Latin America	1.35	2.24	-0.88		
Africa	0.86	2.13	-1.27		
Asia	3.87	3.31	0.57		
High income countries	1.46	1.54	-0.09		

Table 2. Decomposition of productivity growth, percent (unweighted averages), 1990–2005

For Latin America, the "within" component of productivity growth between 1990 and 2005 exceeds two percent annually, but the negative contribution of structural change has lowered the overall rate of growth by nearly 50 percent to 1.35 percent. More importantly, a comparison with the period 1950 to 1975 reveals virtually identical "within" components of productivity growth in the two periods, but the structural change component went from 2 percent in the first to -0.2 percent in the second period—an astounding reversal in the course of a few decades. A key mechanism documented in relation to this reversal is what is called "industry rationalization," which means the least productive firms exit the industry while the firms that remain shed "excess labor." The question left unanswered then is what happens to the workers who are thereby displaced. The evidence suggests that displaced workers may have ended up in *less* productive activities. In other words, rationalization of manufacturing industries may have come at the expense of inducing growth-reducing structural change. The decline in the contribution of structural change has been a key factor behind the deterioration of Latin American productivity growth since the 1960s.

The surprising pattern of growth-reducing structural change that we observed above for Latin America is repeated in the case of African countries. This only deepens the mystery because, in general, Africa economic development level is much lower than that of Latin America. If there is one region where the flow of labor from traditional to modern sectors of the economy would be expected to be an important driver of growth, it's Africa. The growth pattern is even more puzzling in light of the reforms that African countries have undergone since the late 1980s. But, labor seems to have moved from a high-productivity activity to a low-productivity activity, which reduced Africa's growth by 1.3 percentage points per year on average. In general, Africa exhibits a lot of heterogeneity, but the sector with the largest relative loss in employment is formal wholesale and retail trade where productivity is higher than the economywide average. The expansion of employment into manufacturing has been meager, at around one-quarter of one percent during the past fifteen years. The sectors experiencing the largest employment gains tend to be community, personal, and government services, which have high levels of informality and are least productive.

Asian countries have, during the same period, experienced productivity-enhancing structural change, in contrast to the productivity-reducing structural change observed both in Latin America and Africa. It is, therefore, difficult to ascribe

Africa's and Latin America's performance solely to globalization or other external determinants. Clearly, country-specific forces have been at work as well. In fact, differential patterns of structural change account for the bulk of Latin America's as well as Africa's underperformance relative to Asia. In other words, Asia has outshone the other two regions not so much in productivity growth within individual sectors (where performance has been broadly similar), but rather in ensuring that the broad pattern of structural change contributes to, rather than detracts from, overall economic growth.

BEYOND ECONOMIC RECOVERY: THE AGENDA FOR ECONOMIC TRANSFORMATION IN AFRICA

Ousmane Badiane

Successful economic transformation is typically associated with a migration of labor out of the rural agriculture sector into the urban industrial sector—leading to higher economywide productivity levels and progressively raising incomes in the former sector toward the level of incomes in the latter. This is not, however, what has been observed in African countries during most of the first five decades of their independence. Driven by urbanization and decades of neglect of agriculture, most countries have seen rapid labor migration out of a stagnating agriculture sector into an informal services sector—with even *lower* productivity levels. The contribution to overall economic productivity has therefore been negative. The problem is as much the lack of growth in agriculture as it is inadequate labor absorption outside of agriculture. The industrial sector has seen zero to negative growth, leaving the entire burden of absorbing the growing labor force to the informal services sector. The latter has expanded at an extremely rapid pace to a size that is currently not justified by the level of development of African economies. The agriculture sector, on the other hand, has shrunk faster than is normal under successful transformation. As shown in Figure 2, the actual size of the agriculture sector among most African countries is nearly 20 percentage points lower than could be explained by their level of economic development. The opposite is observed for the service sector in the majority of countries (see Figure 3).





Source: Badiane 2011.



Source: Badiane 2011.

Comparison with other developing regions confirms the underperformance of the agriculture sector and the bloated nature of the services sector in Africa. For example, the average GDP share of agriculture among African countries is significantly smaller than that of South Asian countries with similar levels of income. It hardly exceeds the average share of agriculture in the GDP of countries in East Asia, the Middle East, and North Africa, although the latter regions have per capita incomes that are three times higher than that of Sub-Saharan African countries. Africa also has the highest average GDP share for services among developing regions. The GDP share of the services sector in Africa is only slightly lower than the average share of Latin American countries, which have an average per capita income that is nearly eight times higher than the African average (Badiane 2011). This imbalance in sectoral growth has delayed structural transformation and slowed productivity and income growth across Africa. There is a need for renewed industrialization strategies to sustain and broaden the recovery within and beyond the agriculture sector

For structural transformation to be successful, it's critical that countries strengthen their capacity to acquire greater capabilities to produce more sophisticated, higher-value goods for which demand expands globally as incomes rise. The extent to which African countries have been able to develop comparative advantage in the production of such goods can be assessed by using an indicator called EXPY developed by Hausmann and Klinger (2006). The indicator can be interpreted as a measure of the prevalence of high-value goods in an economy's production and export portfolio of goods. Between 1962 and 2000, the value of the indicator for African countries has fluctuated between 20 and 40 percent of the value achieved by a sample group of nearly 100 countries. Moreover, African countries have shown no further progress in product sophistication since the end of the 1960s. The lack of progress toward product sophistication, in particular in the agriculture sector, has real strategic implications. First, it is hard for the sector to raise labor productivity and incomes if it fails to achieve comparative advantage in higher-value products with greater income elasticity. Greater product sophistication would allow African countries not only to raise the overall value and the individual unit value of export to global markets but also to capture a greater share of the fast-growing demand for urban food in regional markets.

Economies diversify into higher-value products because entrepreneurs successfully invest in "discovering" and

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profitably producing new goods by trying out a combination of new technologies and firm-level processes (Hausmann, Hwang, and Rodrik 2007). Therefore, the goal of industrialization policies should be to raise the number of entrepreneurs that can engage in the discovery process by reducing the external information and coordination that can be significant deterrents. Information externalities arise because individual entrepreneurs have to bear the risk, uncertainty, and cost associated with discovering which products the economy can ably produce. When successful, they cannot capture the full benefit of their discovery as others are free to take up production of the same good. Coordination externalities arise when the market fails to align investment and production decisions of individual entrepreneurs. This outcome could result because complementary services and inputs that are required for a profitable investment are too high for the individual entrepreneur to bear or are nontradable. Both issues reduce returns to investments by private entrepreneurs and slow the pace of growth in the industrial sector.

The new generation of industrialization strategies in African countries will have to address deterrents effectively through technology, infrastructure, and macroeconomic policies. New industrial policies would have to target enterprise creation and growth, not only in manufacturing but also in the agribusiness sector and the informal services sector. The rising demand in urban food markets creates a real opportunity for industrialization based on agribusiness. Programs in this area should target increased on-farm productivity as well as new processing and packaging technologies to support product innovation, competitive distribution networks, and low-cost, international transport infrastructure. Industrialization strategies in the informal sector should focus on modernization and expansion of the handicraft and artisanal household goods sector (Sonobe and Otsuka 2011).

INDUSTRIAL POLICY AND THE PROMOTION OF STRUCTURAL TRANSFORMATION

Dani Rodrik

As poor countries get richer, sectoral production and employment tend to become less concentrated and more diversified until relatively late in the development process. The trick to raising productivity seems to be mastering a broad range of activities, instead of concentrating on what one does best—that is, exploiting a comparative advantage. So, why are some countries better able to develop this mastery than others? Why do some economies find it easier to diversify from traditional to nontraditional products and keep the progression rolling along? The answer is innovation. Innovation enables restructuring and productivity growth, and, in the developing world, it appears to be constrained not on the supply side but on the demand side. Innovation is undercut by lack of demand from its potential users in the real economy—that is, from entrepreneurs. And, in turn, the demand for innovation is low because entrepreneurs perceive new activities to be of low profitability.

There are two key market failures that weaken the entrepreneurial drive to restructure and diversify low-income economies. One has to do with the informational spillovers involved in discovering the cost structure of an economy, and the other has to do with the coordination of investment activities with scale economies. Given these externalities, it is increasingly recognized that developing societies need to embed private initiative in a framework of public action that encourages restructuring, diversification, and technological dynamism beyond what market forces on their own would generate. Industrial policies refer to restructuring policies in favor of more dynamic activities generally, regardless of whether those are located within industry or manufacturing per se. Indeed, they may concern nontraditional activities in agriculture or services. The nature of industrial policies is that they complement market forces—meaning they reinforce or counteract the allocative effects that the existing markets would otherwise produce. The task of industrial policy is as much about eliciting information from the private sector on significant externalities and their remedies as it is about implementing appropriate policies. There is thus a need to develop a framework for conducting industrial policy that maximizes its potential to contribute to economic growth while minimizing the risks that it will generate waste and rentseeking. The right model for industrial policy is one of strategic collaboration between the private sector and the government with the aim of uncovering where the most significant obstacles to restructuring lie and what type of interventions are most likely to remove them. Correspondingly, the analysis of industrial policy needs to focus not on the policy *outcomes*—which are inherently unknowable ex ante—but on the policy *process*. The correct way of thinking of industrial policy is as a discovery process—one where firms and the government learn about underlying costs and opportunities and engage in strategic coordination.

There are several generically desirable architectural features of institutions for industrial policy. The first component is strong political leadership at the top. The presence of high-level policy support raises the profile of industrial policies and enables problems of economic transformation to be appropriately received and addressed at the highest levels of the government. High-level policy support also provides coordination, oversight, and monitoring for the bureaucrats and the agencies entrusted with carrying out industrial policies. Political leadership at the top identifies a clear political principal as accountable for the consequences of industrial policies. A second important feature of solid institutions for industrial policy is the existence of a coordination and deliberation council. While institutional choices will naturally differ from setting to setting, depending on initial conditions, there is a generic need for coordination or deliberation councils within which the information exchange and social learning, as discussed above, can take place. These are private–public bodies that ought to include relevant groups or their representatives. A third desirable feature consists of transparency and accountability mechanisms. Industrial policies need to be viewed by society at-large as part of a

growth strategy that is geared to expand opportunities for all, rather than as giveaways to already privileged sections of the economy. Although it is impossible (and undesirable) to specify ex ante the policy outputs that the type of architecture discussed above will yield, it is possible to list some general design principles that can inform the formulation of the resulting industrial policies (see Box 1).

Box 1. Design principles for optimal industrial policy formulation

- 1. Incentives should be provided only to "new" activities.
- 2. Clear benchmarks and criteria for success and failure should be set.
- 3. Build in a "sunset clause"—or, an expiration date.
- 4. Public support must target activities, not sectors.
- 5. Subsidized activities should have clear potential for providing spillovers and demonstration effects.
- 6. Strengthen authority for carrying out industrial policies vested in agencies with demonstrated competence.
- 7. The implementing agencies must be monitored closely by a principal who has political authority at the highest level and a clear stake in the outcomes.
- 8. The agencies carrying out promotion must maintain channels of communication with the private sector.
- 9. Optimally, mistakes that result in "picking the losers" will occur.
- 10. Promotion activities need to have the capacity to renew themselves so that the cycle of discovery becomes an ongoing one.

Industrial policy should not be thought of as a generic range of incentive programs. It is instead a process designed to elicit areas where policy actions are most likely to make a difference. Governments that understand this will be constantly on the lookout for ways in which they can facilitate structural change and collaboration with the private sector. As such, industrial policy is a state of mind more than anything else. To relate industrial policy to the broader policy agenda that faces developing countries, it is important to note that much of industrial policy is concerned with the provision of public goods for the productive sector. From this perspective, industrial policy is just good economic policy of the type that traditional, orthodox approaches prescribe. The capacity to provide these public goods effectively is an important part of the social capabilities needed to generate development. This, in turn, requires good institutions, with the key features discussed above. Such institutional development is at the core of today's orthodox development agenda. In both senses, then, the agenda of industrial policy described here does not differ greatly from today's broader, conventional development agenda; in fact, it is part and parcel of it.

THE ROLE OF AGRICULTURE IN STRUCTURAL TRANSFORMATION

Hans P. Binswanger-Mkhize

Agriculture constitutes only about one-fifth of Africa's GDP and about half of the total value of its exports, yet a majority of Africans still depend on the sector for their livelihood. Enhancing the performance of the continent's agriculture is therefore central to achieving sustained poverty reduction. Usually, economic development is accompanied by a declining share of agriculture in both GDP and the labor force with convergence in agricultural factor incomes and productivity toward those of other sectors at a relatively late stage in the process. Despite a declining share of agricultural output, agricultural output would keep increasing throughout the process in absolute terms. Such growth can make a key contribution to poverty reduction through a number of routes: raising agricultural and rural nonfarm profits and labor income; leading to lower prices for (nontradable) foods; or tightening urban and rural labor markets and thereby raising unskilled wages in the wider economy.

Unfortunately, unlike in the advanced and better-performing developing countries, such a structural transformation has not yet taken place in Africa. This is unsurprising as Africa for many years experienced both high population growth rates and very low economywide growth. While the average share of agriculture in GDP has declined from 21 percent to 17 percent since the 1960s, the share of agriculture in the labor force declined from 83 percent to 64 percent—still vastly exceeding its output share. The agricultural expansion was primarily achieved by extension of cultivated areas and increased labor supply, not through technological change and more intensive use of labor and land (see Table 3). As a consequence, African agriculture remains extremely under-capitalized, and the number of poor and hungry people has increased in both rural and urban areas. Despite its weak past performance, agriculture can play a crucial role in the structural economic transformation of Africa going forward

In 2010–11, African economies expanded at an average annual rate of 5.3 percent, following low annual GDP growth in the 1–3 percent range between 1980 and 2000. Stronger economywide growth benefits agriculture directly because it increases demand and therefore prices of nontraded agricultural goods. Furthermore, the positive factors that lead to higher economywide growth—such as improved macroeconomic stability, a better investment climate, and lower real interest rates—are also good for agriculture. In particular, price incentives for agricultural producers have significantly improved following the establishment of unified exchange rates, lower industrial protection, and reduced export taxation of agricultural exports. Additionally, international agricultural prices have sharply improved recently. Although in the short run higher food prices exacerbate the situation for poor urban populations and poor net buyers of food in rural areas, in the longer run, higher food prices should lead to (1) higher farm profits, (2) larger savings and farm investments, (3) faster rates of technology adoption, and (4) increased off-farm and agro-industrial linkages. Even more importantly, there has been a renewed commitment of African governments to agriculture during the past five years. The New Partnership for Africa's Development (NEPAD), an initiative of the African Union, launched the Comprehensive Africa Agriculture Development Programme (CAADP), and, as of March 2012, around 30 countries had signed a CAADP compact to guide their agricultural strategies. Furthermore, in their Maputo declaration of 2003, African Heads of State committed to allocate at least 10 percent of public expenditures to agriculture.

Table 3. The lo	ng-term evolution	of the structure of	African economies	and agriculture
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Structure of the economy	1961-70	1971-80	1981-90	1991-00	2001-07
Population growth (annual %)	2.52	2.80	2.93	2.71	2.47
GDP per capita (constant 2005 PPP\$)	1,451.00	1,775.00	1,643.00	1,516.00	1,685.00
GDP per capita growth (annual %)	2.40	0.80	-1.13	-0.40	2.43
Growth in gross agricultural output (average annual %)	3.43	0.77	2.82	3.18	2.54
Growth in real agricultural value added (average annual %)	N/A	2.27	2.05	2.95	3.25
Industry, value added (% of GDP)	31.00	33.00	34.00	30.00	30.00
Manufacturing, value added (% of GDP)	17.00	17.00	17.00	16.00	14.00
Services etc. value added (% of GDP)	48.00	48.00	48.00	53.00	52.00
Agriculture, value added (% of GDP)	21.00	20.00	18.00	18.00	17.00
Crop share of agricultural output (% of total)	76.80	76.40	74.60	77.90	77.30
Livestock share of agricultural output (% of total)	23.20	23.60	25.40	22.10	22.70
Crop area harvested (million hectares)	92.70	99.80	109.70	147.20	171.00
Crop output per hectare harvested (constant 2000 US\$)	278.60	315.30	336.20	363.70	404.20
Animal output per head of cattle-equivalent (constant 2000 US\$)	41.40	43.60	48.10	49.90	53.80
Agricultural labor force (millions)	95.60	114.40	139.40	170.10	198.40
Share of labor force employed in agriculture (% of total)	82.90	78.20	73.10	68.20	63.80
Agricultural output per worker (constant 2000 US\$)	377.20	361.10	354.80	402.30	444.00
Area harvested per worker (hectares)	1.04	0.88	0.79	0.86	0.85
Growth in agricultural output per worker (average annual %)	1.55	-0.96	0.70	1.22	0.72
Irrigated cropland (% of area harvested)	3.10	3.40	3.90	3.40	3.30
Fertilizer per area harvested (kilogram per hectare)	3.00	7.10	10.00	8.50	7.60
Tractors per area harvested (units per 1000 hectares)	0.70	1.00	1.20	1.10	1.10
Percent of population living on less than \$2/day (constant 2005 PPP\$)	N/A	N/A	74.90	77.10	74.30

A number of actions are needed to propel agriculture and the broader economy toward a faster structural transformation. First, domestic and subregional markets need to be recognized as representing the main opportunities for African producers in the short-to-medium term. Second, to improve agricultural profitability, farmers need to have access to input and output markets. More support should be given to farmer associations because membership in these associations can allow small farmers to overcome scale economies that hinder input markets as well as the development of output markets. Third, governments need to significantly increase investment in agricultural technology generation and dissemination at national and subregional levels that will help increase resilience against the many stressors affecting agricultural activities in Africa. Fourth, stronger regional action is needed to help small countries with limited financial capacity expand regional trade in agriculture and food products, improve regional and internal infrastructure, improve indigenous scientific and research capacity, and adopt regional approaches to rural financial architecture. Fifth, focus on smallholder development as a way of reducing poverty as there is little to suggest that the promotion of largescale farming is likely to be successful enough to reach the rural poor in Africa. Finally, the private sector; communities and civil society; local governments; and sector institutions concerned with health, education, and agriculture need to collaborate to promote local and community development via public-private partnerships and other mechanisms. Building the capacity of agricultural and rural institutions can best be done in the context of a broader, national capacitydevelopment strategy and program. It cannot be done through top-down provision of services. Rather it involves learning by doing whereby communities, local governments, farmers' organizations, and private-sector actors are given opportunities and resources and can exercise control over their own development.

RESEARCH CHALLENGES: DEVELOPMENT ECONOMICS AND AGRIBUSINESS THEORY

Fleur Wouterse

For structural transformation to take place in Africa, the poor performance of the agriculture sector, which has long been neglected, would need to be addressed. Applying the analytics of structural transformation demonstrates clearly that on-farm productivity needs to increase so that the share of agriculture in the labor force matches (or at least no longer vastly exceeds) its output share. At the same time, rising demand in urban food markets creates a real opportunity for industrialization based on agribusiness (see "Beyond Economic Recovery" section above by Ousmane Badiane). To propel agriculture and the broader economy toward a faster structural transformation, a number of actions are needed, but two are particularly pertinent. First, there is a need to focus on smallholder development as a way to increase incomes of a large share of the population and reduce poverty. Second, to improve their profitability, smallholders need to have (better) access to input and output markets (see "The Role of Agriculture in Structural Transformation" section above by Hans P. Binswanger-Mkhize). To this end, there is an important role for collective action generated in, for example, producer organization or cooperatives. While we have witnessed a renewed commitment of governments and donors to Africa's agriculture sector, new industrial policies would need to focus on enterprise creation and growth in the agribusiness sector. For research then, the key is to evaluate the interface of the changes in market organization and institutions on the one hand and technology adoption by various actors in the food system on the other.

New institutional formations—particularly, groups of smallholders gathering together in order to improve their access to markets—that emerge in the process of agro industrialization have been studied by two distinct fields of applied social science: development economics and agribusiness research. In the field of development economics, the micro-analytical approach has explicitly made institutions endogenous, particularly the process of institutional change and the choice and design of institutional arrangements. The neoclassical model fails to take institutions into account while the new institutional economics and the information theoretic school offer formal endogenous theories of institutions. The former focuses on the historical process of institutional change, the economics of property rights and the transaction cost economics theory of the firm; the latter analyzes market and nonmarket institutional arrangements within the rural sector of developing countries explaining the emergence and structure of contracts in terms of incomplete information, moral hazards, and missing markets. Within the field of agribusiness economics (or, the study of coordination between vertical and horizontal participants within the food chain), prominent analysis has included contract-oriented approaches, transaction-cost economics, principal-agent concepts, and supply-chain management. The field of agribusiness management (or, the study of intra-firm coordination and motivation) has more recently approached agro-industrialization from a strategic management direction using resource base theory and a new institutional economics direction usually divided into agency theory, transaction-cost economics, and incomplete contracts (Cook and Chaddad 2000).

Using micro-analytic approaches in their study of the same socioeconomic phenomenon—agro-industrialization these two fields of applied social science are remarkably able to progress alongside one another without taking the other's work into account. Clearly, complementarities exist: that is, increased levels of micro-analytical development work on the agro-industrialization process have the potential to significantly increase the marginal return to agroindustrialization oriented output of agribusiness researchers and vice versa (Cook and Chaddad 2000). For example, technological and institutional changes in the agrifood sectors of many developing countries are perhaps better understood using contemporary management theory than conventional production theory (Reardon and Barrett 2000). Real progress will therefore partly depend on our ability to bridge the literatures and harmonize languages across the disciplines of agribusiness and development economics. The other main challenge will be to inductively build from the rich mass of case study evidence a theory; due to the utter complexity of modeling institutions, spatial arrangements, technological change, international flows of goods and capital, and general equilibrium employment and price effects the capacity of traditional, deductive modeling to generate robust results that accurately reflect the fast-changing features of the agro-industrial landscape (Reardon and Barrett 2000).

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