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Agriculture for Economic Development in Africa

Evidence from Ethiopia

Emelie Rohne Till

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Keywords

Agricultural transformation • Economic growth • Sub-Saharan Africa • Ethiopia

Contents

About the Author

Emelie Rohne Till, **Ph.D.**, is a Lecturer in Economic History at Lund University, Sweden. Her main area of expertise includes the role of structural transformations in the development of low-income countries, as well as the role of the agricultural sector in this process. Her Ph.D. thesis studied this subject through a case study of Ethiopia's recent and rapid economic growth and was set at the intersection of economic history and development economics. In regards to teaching, her main fields of experience include Asian economic history, development studies, and agricultural economics. Prior to receiving her Ph.D., Dr. Rohne Till worked as a consultant at a management consultancy specialized in countries in transition in the Middle East and North Africa. This work involved both quantitative and qualitative research on topics such as women's role in peace and security, public service delivery and public administration reform, and evaluations of humanitarian programs in the MENA region.

Dr. Rohne Till holds a Ph.D. in Economic History from Lund University, a Master's Degree in International Economics with a focus on China from Lund University, and a Bachelor's Degree in Development Studies from Lund University.

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PART I

CHAPTER 1

Introduction

Abstract The twenty-first century has seen the concurrent rise of optimism about economic growth in sub-Saharan Africa and the return of the agricultural sector to the top of the development agenda. Ethiopia—with its rapid economic growth for two decades, achieved during a policy focus on the agricultural sector—is at the forefront of both these developments. This chapter introduces the book's main theme of the role of agriculture in economic development, which is addressed based on a case study of Ethiopia.

Keywords Economic development • Agricultural-led growth • Sub-Saharan Africa • Ethiopia

The twenty-first century has seen increased optimism about the prospects for African economic development, and the oft-cited *The Economist* cover of 2000 depicting Africa as a "hopeless continent" has long seemed obsolete. Ethiopia, with its average annual GDP per capita growth of over 6% since the turn of the millennium (IMF, 2020), is at the forefront of the current wave of optimism. The country's rapid growth has been achieved under a policy focus on the agricultural sector—another aspect of development that has seen a renewed wave of optimism in the twenty-first century. After two decades of neglect in the 1980s and 1990s, the role of the agricultural sector in economic development has again risen to the top of the

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development agenda for many scholars, policymakers, and donors. This background forms the starting point of this book, which studies Ethiopia's rapid—but so far relatively short—growth during the implementation of the macro-level development policy "agricultural development-led industrialization" (ADLI), first established in the early 1990s. The research uses the Ethiopian experience as a case to study the role of the agricultural sector in economic growth in low-income countries.

Based on its research the book makes two main arguments: first, that the agricultural sector remains an important engine of growth in low-income countries; and second, that there is scope for states in contemporary low-income countries to take a leading role in the transformation of the agricultural sector on the path toward long-term economic growth. These arguments synthesize the research which is presented in three main parts in the book. The book's first part discusses the role of agriculture in economic development from a theoretical perspective, as well as the role that can be played by the state to foster agricultural development and the recent development experience in sub-Saharan Africa (SSA). The second part of the book elaborates on the context of the case study, in terms of the economic, political, and agricultural context of Ethiopia. The third and last part covers the book's empirical investigation. Based on a method of Semi-Input-Output multiplier analysis (SIO), the book estimates the Ethiopian agricultural sector's contribution to aggregate growth through its linkages with other sectors. This analysis reveals that agricultural growth has been central to the aggregate growth given Ethiopia's economic structure, validating the central hypothesis derived from the first part of the book on the important role that agriculture can play in economic development.

Aim and Contribution

This research aims to use Ethiopia's recent experience of rapid growth as a case to explore whether agricultural-led growth is happening in a country in SSA today and to understand if this can be a path toward long-term economic growth. Agricultural-led growth is understood as a process in which agricultural growth due to increased agricultural productivity (which, in turn, stems from increased public investment combined with technological advancements) stimulates aggregate growth. In this process, agricultural growth both generates a surplus to fuel the aggregate

economy and increases farmers' incomes, generating demand for locally produced products. This understanding of the link between agricultural growth and economic growth draws explicitly on Adelman's (1984) definition of "agricultural demand-led growth" (ADLI) and generally on the broader agriculture-for-development perspective, as outlined in the World Development Report 2008 (World Bank, 2007). Implicitly, the research also aims to generate insights that can be used to draw lessons for other contemporary low-income countries in SSA, although any such lessons must be drawn with caution and consideration for each country's specific context.

With these aims in mind, the book's main topics of interest are the role of the agricultural sector in economic growth in today's low-income countries, as well as the role of the state in both agricultural and economic growth. These topics are explored through theoretical discussions and through an empirical case study of Ethiopia's agricultural and economic growth, mainly from the 1990s onward. The case study focuses on Ethiopia's recent economic history during a time of significant economic change and attempts to do so in the context of longer trajectories in the history of the Ethiopian economy.

This work contributes to the previous literature by lending support to the large body of work arguing that the agricultural sector is important for initial economic growth in low-income countries. It adds to the existing literature by specifically focusing on one relevant case. Given its rapid economic growth, achieved under a policy focus on agriculture, large size, and political importance, the case of Ethiopia is an important contribution to the debate.

Case Study Approach

The book adopts a case study approach primarily based on national-level data. As discussed by Alston (2008), macro-level case studies can be useful inroads toward developing an understanding of both the determinants and consequences of economic change. The country-specific approach is justified by the difficulty of generating insightful results through multi-country or continent-wide approaches, which are limited by the diversity among nations. All countries pursuing economic development have a unique point of departure in terms of physical endowments, social and political settings, and historical context. Moreover,

development outcomes often vary even among countries that share some of these characteristics (Nayyar, 2018). The macro-level, national approach is most appropriate for the sectoral-level interest in the role of the agricultural sector in economic change. In addition, the data that is needed for this question is mostly available at the national level. Finally, both agricultural and economic growth are affected by institutional and economic policies, which are determined at the national level (Lains & Pinilla, 2009).

The case study of Ethiopia is not intended to be interpreted as a representative case for the broader SSA experience. Instead, it is intended to be a careful, country-specific study that considers Ethiopia's specific conditions to shed light on its particular development outcomes. Ethiopia is studied for its own sake, neither as a representative nor as an outlier. On the one hand, Ethiopia has some high-level similarities with other countries in SSA; the country is poor, largely rural, has experienced economic and agricultural growth, and has undergone a slow structural transformation toward manufacturing since the turn of the millennium. On the other hand, there are also differences, such as Ethiopia's large population, relative population density in certain areas, different historical experiences of colonization, and long history of state formation. Neither the unifying nor the distinguishing traits are strong enough for Ethiopia to be seen as either representative of or distinct from the SSA experience. Instead, Ethiopia is chosen because its experience of agricultural and economic growth coinciding with a policy focus on the agricultural sector makes it a suitable case for the main research interest: the role of the agricultural sector in economic growth in a contemporary low-income country.

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CHAPTER 2

The Role of Agriculture in Economic Development

Abstract The book's main research focus is the role of the agricultural sector in economic development. This chapter discusses the main theoretical underpinnings of this role based on the extensive body of literature on this subject. The chapter covers both the role of agriculture for economic development and the development of the agricultural sector itself with a focus on the macro-level drivers of agricultural development.

Keywords ADLI • Agriculture for development • Agricultural development

The book's core research focus is to understand the role that the agricultural sector can play in economic development as well as the role of the agricultural transformation in the broader processes of economic and structural transformation. These processes involve the sectoral shift of output and employment away from low-productive agriculture into more productive activities. They are generally accompanied by a greater diversification of livelihoods both on- and off-farm, stronger rural and urban interaction, and the creation of more employment and investment opportunities outside the agricultural sector (Mellor, 1976; Timmer, 1988; Jayne et al., 2018).

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Agriculture for Development

Agricultural and development economics both emerged as sub-fields in the middle of the twentieth century (Arndt, 1987; Barrett et al., 2010). Since then, the view of the role that agriculture can play in economic development has shifted over time. Early perspectives in the 1950s and 1960s emphasize a largely passive role of the agricultural sector (Lewis, 1954; Hirschman, 1958; Ranis & Fei, 1961; Jorgenson, 1961). In this view, agriculture's contribution to development is to reallocate labor and indirectly contribute to much-needed savings and investments in the modern sector; the sector was mainly regarded as a reservoir of labor and transferable surplus. This was followed by research that further downplayed the role of agriculture in economic development based on the core concept of the Prebisch–Singer thesis, suggesting deteriorating terms of trade for primary products in relation to industrial goods (Singer, 1950; Prebisch, 1959; Preobrazhensky, 1965).

The mid-1960s saw a shift toward viewing agriculture as a potential engine of growth. This change in perspective followed the contributions of Johnston and Mellor (1961) on how agriculture can contribute to growth in the overall economy through various linkages (labor, food, foreign exchange, market, and domestic savings). In the 1980s, the view shifted again, this time toward an industrial focus. This tendency was followed by several studies in the 1990s and early 2000s, arguing that agricultural growth stems from, rather than leads to, overall growth (Estudillo & Otsuka, 1999; Gardner, 2000; Mundlak et al., 2004). However, since around 2005, the view that agricultural growth can drive overall growth has resurfaced. This perspective is exemplified by the 2008 World Development Report on agriculture (World Bank, 2007) and the signing of the Maputo Declaration in 2003, in which all African leaders of state committed to dedicating at least 10% of public spending to agriculture (AGRA, 2018).

Four main theoretical schools of thought can be identified as having influenced the shifting debate outlined above (see Andersson & Rohne Till, 2018 for an elaborated discussion). First, according to the "fifth wheel" school, agriculture is not by itself seen to stimulate economic development, although it might stifle the process if neglected (Lewis, 1954; Ranis & Fei, 1961; Jorgenson, 1961). Second, the Chicago school emphasizes rationality and anti-distortions, led by the work of Schultz (1964) and his followers (e.g., Krueger et al., 1988, 1991; Anderson,

2009a, 2009b). The third main school of thought focuses on the role of agriculture in trade; agriculture is seen as either a break (Prebisch, 1959) or an injection (Myint, 1958). The fourth school of thought views agriculture as a potential driver of growth. One strand of this diverse school of thought has its roots in structural change analysis, understanding the relative decline of agriculture in the process of long-term economic growth (Clark, 1940; Kuznets, 1961, 1966; Chenery & Syrquin, 1975). A related strand emphasizes agricultural growth's potential to strengthen the domestic market, thereby stimulating aggregate growth. Adelman (1984) explicitly theorizes this mechanism in her development of the concept of agricultural demand-led industrialization (ADLI).

The agriculture-for-development view has been a prominent perspective on the role of agriculture in economic growth since around 2005. While agriculture's role in stimulating growth and reducing poverty has also been questioned during this time (Ashley & Maxwell, 2001; Hasan & Quibria, 2004; Ellis, 2004; Collier & Dercon, 2009), agriculture's contribution to economic growth has much support in the economic history of today's high-income countries in Europe and East Asia (Ohkawa & Rosovsky, 1960; Bairoch, 1973; Johnston & Kilby, 1975; Timmer, 1988; Lains & Pinilla, 2009). A core assumption of the agriculture-for-development perspective is that farmers in low-income countries, often working small plots, can be efficient producers capable of generating a surplus that can benefit the wider economy (Mellor, 1976; Lipton, 2005; World Bank, 2007; Diao et al., 2010). As such, increasing the productivity of these small farmers is a key concern. In addition to increases in agricultural productivity among farmers, a thriving rural nonfarm sector and diversification toward higher-productivity crops are also important elements of success. However, while the rural nonfarm sector can be a productive outlet, it is also a very diverse sector, including petty and under-capitalized activities with very low returns to labor and also productive activities that are better rewarded. The nature of the sector is likely linked to the dynamism of agriculture and the general economy (Wiggins et al., 2018).

The concept of ADLI is of special importance for the current research, given the connection between Adelman's academic concept of ADLI and Ethiopia's implementation of ADLI. Drawing on Singer (1979), Adelman (1984) developed ADLI as a development strategy emphasizing the importance of agricultural growth in stimulating overall production and growth. Under ADLI, agricultural growth arising from increased

agricultural productivity (stemming, in turn, from increased rural investment and technological innovation) stimulates aggregate growth; agricultural growth increases farmers' incomes, which generates demand for locally produced non-tradable products. This farm demand for domestic non-tradables is the main link between agricultural growth (raising farmers' incomes) and nonagricultural growth.

Empirically, ADLI was first tested in Adelman's (1984) seminal paper, in which she simulated growth scenarios comparing an export-led (in essence, manufacturing-led) industrialization strategy and ADLI, for South Korea in 1963. She found that while both strategies would generate growth, ADLI would lead to better overall development compared to export-led growth, as ADLI led to higher labor absorption, more equal distribution of income, less poverty, and a higher rate of per capita economic growth (Adelman, 1984, p. 939). These results mainly stemmed from the linkages generated by the agricultural sector that were stronger than those generated outside of agriculture, as farm households demanded more goods and services from domestic food and nonfood industries than other households. In the simulations, the same amount of investment was channeled into the export sector or the agricultural sector. This led Adelman to conclude that ADLI at some stages of development both generated better economic development and yielded a higher rate of return, and should therefore be prioritized. Other studies that have explicitly tested ADLI include Vogel (1994) and Bautista et al. (1999). Moreover, much of the work on calculating agricultural multipliers and linkages (as summarized by Haggblade et al., 2007) shares a similar rationale as Adelman's study. Overall, this literature finds that an ADLI strategy can contribute considerably to overall economic growth.

Adelman's ADLI strategy was intended to be an alternative development strategy for low-income countries. However, Adelman did not claim that ADLI was always the right choice for this type of countries. Instead, the strategy mainly targets countries that have (1) a potentially large domestic market and (2) an industrial base with established supply responsiveness. Adelman and Vogel (1991) explored the implications of these criteria for successful ADLI implementation in sub-Saharan Africa (SSA). They found that while agriculture has relatively strong linkages in SSA, most countries do not fulfill the second criteria of established supply responsiveness (because the manufacturing production capacity is quite limited, many types of consumer goods are not produced domestically, and most intermediates and machinery are imported). Therefore, they concluded

that an ADLI strategy was unlikely to be successful in most SSA contexts. Thirty years later, it seems that the Ethiopian implementation of ADLI may be proving their pessimistic predictions wrong.

Agricultural Development

As the realization of agriculture for development depends on agricultural growth, this section provides a brief contextualization of the literature on agricultural development. The literature on the drivers and features of agricultural change is vast, and much important work has been done on the subject in the post-war era (Barrett et al., 2010). In general, the macro-level conditions needed for agricultural development are well-known: a reasonably stable macro-economic and political environment, effective technology transfer, and product and factor markets that are functional and accessible (Mosher, 1966; Tsakok, 2011). However, these insights do not allow for a specific understanding of how on-the-ground, micro-level change is engendered. Agriculture is, in essence, a private activity undertaken by millions of individual actors (Mellor, 2018). Therefore, village-level studies and analyses of localized production systems are needed to get closer to an understanding of what drives agricultural production and productivity increases (Wiggins, 2000; Andersson Djurfeldt & Djurfeldt, 2013).

However, while agriculture is a predominantly private activity taking place at the micro-level, the success of individual farmers is conditioned by public and macro-level forces. Agricultural growth—and its potential benefits—depends on favorable developments in the economic and political environment, technology transfer, and product and factor markets. The literature on what drives these conditions is large, and at least four major drivers are proposed in the literature: factor relations (Binswanger & Ruttan, 1978; Hayami & Ruttan, 1971, 1985), population dynamics (Boserup, 1965), technology availability (Otsuka & Kijima, 2010; Estudillo & Otsuka, 2013; Otsuka & Muraoka, 2017), and the state (Djurfeldt et al., 2005; Hazell, 2009; Henley, 2012; Frankema, 2014). This book is particularly concerned with the strand of the literature on macro-level agricultural development concerning the role of the state, as elaborated on in Chap. 3. However, this focus should not be seen as a quest to identify one single driver of agricultural growth. Such a quest would be futile, as the process is much too complex, and multiple factors both drive growth and affect each other. The macro-level forces of

agricultural change are not substitutes; in any context of agricultural change, the state, factor and product markets, technology, and population dynamics are complements that act and react in the same environment.

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CHAPTER 3

The Role of the State in Agricultural Development

Abstract This chapter discusses the potential role that the state can play in agricultural development. It does so in three main parts. First, it discusses the role of the state in agricultural development from a theoretical perspective. Second, it explores how the state can use agricultural policies to play this role. Third and lastly, it specifically explores the role that policies on agricultural public spending can play in agricultural development.

Keywords Agricultural policies • Agricultural productivity • Agricultural public spending

One strand of literature on the role of the state in macro-level agricultural development views agricultural development as the result of a created supportive economic and policy environment upheld by substantial public spending on agricultural development (Djurfeldt et al., 2005; Hazell, 2009; Henley, 2012; Frankema, 2014). The policy recommendation derived from this work includes for governments to take a leading role in providing necessary technology, an economic and political environment conducive to growth, and substantial public spending on infrastructure, irrigation, and research (Eicher, 1995; Hazell, 2009; Rashid et al., 2013).

The important role of the state is also prominent in the broader debate on the role of agriculture in economic development. For example, Tsakok (2011, pp. 254, 302) argues that the role of governments is essential to

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agricultural and economic development. Similarly, Mellor (2017, p. 11) holds that the agricultural sector must modernize in order for an economy to transform, and states must play a central role in this modernization (Mellor, 2017, p. 11). The critique of the state-led interpretation of agricultural development mainly draws on the observation that past state involvement has in no way guaranteed success. Historically, the world has seen much higher levels of state intervention in agriculture in the post-war era, but this may have done more harm than good to global agricultural production (Federico, 2005; Pinilla, 2019).

Views concerning the appropriate role of the state in agricultural development in sub-Saharan Africa (SSA) have varied over the decades. In the 1960s and 1970s, many scholars, donors, and policymakers considered the state to play a large and important role. However, the translation of the large role of the state into successful agricultural development was largely unsuccessful. While many governments (e.g., those of Kenya, Tanzania, Nigeria, and Ethiopia) implemented comprehensive programs for agricultural development, many such programs turned out to be complete failures. However, despite these uneven or disappointing results, the state was seen as central to both agricultural and economic development under this paradigm. It played this role through the implementation of land reforms; investing in agricultural research and development (R&D), irrigation schemes, and rural development programs; and providing access to inputs and credit (Holmén, 2005; De Janvry, 2010; Henley, 2012; Otsuka & Larson, 2013).

With the new paradigm of the 1980s under the Washington Consensus, the role of the state in agricultural development shrunk dramatically. The period's stabilization and adjustment policies reduced the size and functions of the state in agriculture. During this period, public spending on agriculture and aid to the agricultural sector declined sharply, and many public agencies supporting agricultural development were dismantled (De Janvry, 2010). As we know in hindsight, the hopes that the private sector would successfully fill the vacuum left by the public withdrawal went largely unfulfilled. Instead, this void of institutional support for agriculture was only partially—and unsuccessfully—replaced by the private sector and NGOs in the 1990s (Staatz & Eicher, 1998).

However, the last 15 years have seen a strong re-emergence of the role of agriculture in economic development. The period has also seen a rise of attention toward the role of the state in agricultural development, with a

larger role for the state in the theory and, in some cases, practice of agricultural development (Crawford et al., 2003; Coady & Fan, 2008; De Janvry, 2010).

Agricultural Policies

The return of agriculture, and especially smallholder-based agriculture, to the development agenda since around 2005 is based on the view that smallholders can be efficient producers and that productivity increases among this group lead to both economic growth and poverty reduction. Following this line of thinking, increasing agricultural productivity (especially among smallholders) is a key policy concern (Dorward et al., 2004; Diao et al., 2010). As early stage agricultural development often suffers from various market failures—arising from challenges to economies of scale, access to credit and information, and the inherent climate and market volatility of agricultural production—public policies that support small farmers seek to overcome these challenges (Dorward et al., 2004; Birner & Resnick, 2010). Given this goal, agricultural policies have shifted considerably in the post-2005 era compared to the heavy taxation of the sector in the 1970s and 1980s. Since then, and perhaps especially since the Maputo Declaration of 2003, the discrimination against the agricultural sector has decreased in favor of supporting the sector (Anderson, 2009; Wiggins, 2018).

There are many areas in which the state can intervene in the agricultural sector. These include policies on the ownership of production factors, public spending on general public goods (health, information, etc.), agricultural public spending, transfers from farmers (taxation), interventions in the domestic market of agricultural products and factors, and interventions in the international trade of agricultural products (Federico, 2005, p. 187). Among these, the role of agricultural public spending may be of particular importance. Such importance of agricultural spending is in line with the importance that has been assigned to agricultural public spending in previous agricultural transformations (Johnson et al., 2003; Wiggins, 2014; Mogues et al., 2015) and the renewed emphasis on its centrality to agricultural development in SSA, especially following the Maputo Declaration of 2003 (Diao et al., 2008; AGRA, 2018; De Janvry & Sadoulet, 2019). Agricultural public spending is also the main channel of state involvement in agricultural development in Ethiopia. Indeed,

agricultural public spending is one of the key policies for agricultural development outlined in the government's agricultural development-led industrialization (ADLI) strategy (MOFED, 2002).

Public Spending on Economic and Agricultural Development

Historically, the theory and practice concerning the role of public spending in development have fluctuated widely. Many nineteenth-century economists viewed public spending as a vital instrument for economic development. Fueled by the expanded military during the World Wars, the New Deal-type welfare programs, the policy approach of Keynesianism, and, somewhat later, the important role of public spending in East Asian countries' rapid industrialization, this remained a dominant theoretical perspective until around the 1970s (Lee, 2007). However, the global economic slowdown and rise of the Reagan–Thatcher era challenged the Keynesian theoretical support for public spending; the laissez-faire school, arguing that public expenditure crowded out private investment, gained ground (Little, 1982; Rodrik, 1999). In light of the general "lost decades" in the wake of small public spending in the 1980s and 1990s, the theoretical position on public spending has softened, and there is a broader recognition of the essential role public spending can play in complementing private sector investments. More recent discussions have emphasized states' capability in executing effective public spending and have broadened the theoretical understanding of public expenditure to include institutional and capacity aspects (Coady & Fan, 2008; Tijani et al., 2015). This theoretical re-orientation away from the "small state" paradigm of the 1980s is also reflected in practice, as Yu et al. (2015) find that public spending increased significantly from 1980 to 2010 for the 147 countries in their study.

The main theoretical rationale for public spending is two-fold, including both efficiency considerations and equity considerations. According to the efficiency consideration, the government is superior at providing public goods, which private actors will underprovide. This, in turn, enhances market efficiency and remedies market failures caused by public good issues, risks, externalities, information asymmetries, regulation and coordination issues, and other factors (Myles, 1995; Hindriks & Myles, 2006; Coady & Fan, 2008; Mogues et al., 2015). Accordingly, this school of thought argues that public spending on public goods usually pays off, while public spending on private goods usually does not. Second, the

equity rationale concerns the distribution of goods and services in terms of its effect on the welfare of the poorest segments of the population and on the gap between the best- and worst-off segments of the society (Mogues et al., 2015).

The efficiency and equity rationales are also central to the theoretical discussion of agricultural public spending in particular. Although agriculture is a largely private activity, its success is conditioned by public goods such as human capacity, infrastructure, and R&D; as such, the efficiency consideration is theoretically applicable (Tijani et al., 2015; Mellor, 2017). The equity rationale is also frequently evoked in the discussion on agricultural public spending, as the agricultural sector is often home to the most impoverished segments of a population.

Taken together, the efficiency and equity rationales for public spending suggest a rather optimistic view of what governments can achieve via public spending. These theoretical notions position governments as "benevolent social spenders" that act benevolently and efficiently. However, a large political economy literature suggests that this view must be tempered, as government officials act in accordance with other incentives and constraints rather than purely economic ones (e.g., those provided by citizens, voters, government officials, and lobby groups) (Mogues et al., 2015).

The previous research on the relationship between agricultural public spending and economic development has not established a causal connection (Easterly & Rebelo, 1993; Milbourne et al., 2003; Mogues, 2011), but instead suggests that this relationship depends on the spending's functional type. The main types of agricultural public spending are (1) spending allocated toward increased agricultural productivity, such as irrigation, rural infrastructure, agricultural R&D, or extension (farmer education to disseminate modern practices and inputs) and (2) supportive functions for the agricultural sector such as rural safety nets and input subsidies. These spending types can have very different effects on the agricultural sector. Overall, the large body of evidence on the allocation of agricultural public spending suggests that investing in both physical and human public goods can have positive effects on agricultural growth. Investment in private goods seems to have a more limited effect on growth, although it may contribute to rural welfare (for useful summaries, see Mogues et al., 2012, 2015).

While increased agricultural productivity is a cornerstone of the agriculture-for-development perspective, most observers recognize that not all farmers can "grow themselves out of poverty" (World Bank, 2007).

For farmers in marginal areas (in terms of market access or agro-ecological conditions), stimulating the agricultural sector may not spur poverty reduction. Moreover, some studies find that increased commercialization is not linked to improvements in food security (Andersson Djurfeldt, 2017). As such, spending on safety nets and cash transfers may be a better use of rural and agricultural public spending, than only spending on agricultural productivity enhancement (Masters et al., 2013). Such social protection may increase multiplier effects and encourage local food consumption in the rural economy (Wiggins et al., 2018). However, while the link between increased agricultural productivity and poverty reduction is not direct in all contexts, virtually all instances of mass poverty reduction in modern history have been ignited by increased productivity among small farms (Lipton, 2005).

As a concluding remark in the discussion of the role of the state in agricultural development, this book operates under the assumption that the state matters—and it matters what a government does or does not do. This is reflective of a Hirschmanian view of development: development is the result of what actors in a country do and the results of these actions (Hirschman, 1971; Cramer et al., 2020). While we should acknowledge the weight of history, choices about development must be made in the present, and governments are one important actor making such choices.

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CHAPTER 4

Sustained Growth and Development in Sub-Saharan Africa

Abstract Ethiopia is one of many countries in sub-Saharan Africa (SSA) that has experienced rapid economic growth in the twenty-first century. This chapter explores the underpinnings of the economic transformation that many countries in SSA have experienced, focusing on the aspects of structural transformation, poverty reduction, and the nature of agricultural growth.

Keywords Structural transformation • Poverty reduction • Sub-Saharan Africa

Currently, many parts of sub-Saharan Africa (SSA) are in the midst of an economic transformation. While challenges remain and progress is uneven across countries and regions, a large and growing body of evidence suggests that many parts of SSA have undergone profound economic change since the early 2000s. This economic growth has taken place within an improved political and macro-economic environment and in the context of rising global commodity prices. It has been accompanied by rapid agricultural growth (in some countries), growing rural off-farm employment, and strong local and foreign investment (Frankema & van Waijenburg, 2018; Jayne et al., 2018).

However, two decades into this transformation, a key question is whether these developments will last or whether this is a boom period that

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will—again—be followed by a bust. As noted by many (Jerven, 2010; Frankema & van Waijenburg, 2012; Broadberry & Gardner, 2019), this is not the first time that parts of SSA have seen an extended growth period. The 1950s and 1960s saw widespread optimism concerning growth prospects in SSA, but this optimism waned as growth performance deteriorated. Will this time be different? Some are skeptical, warning that the current growth is volatile and vulnerable because it is driven by commodity exports and foreign direct investment and not accompanied by industrialization, structural transformation, or poverty reduction (Gollin et al., 2016; Fioramonti, 2017). Any effort to understand whether the current growth episode will last must take these concerns seriously, especially as they relate to the rate of poverty reduction, its relationship with structural transformation, and the nature of agricultural growth.

To date, the economic growth across SSA seems to have had but a modest effect on poverty reduction. While many countries have seen a reduction in relative poverty, absolute poverty levels have not decreased, as population growth has offset the improvements. Instead, the rapid growth has been accompanied by disappointing poverty reductions and welfare gains in many countries (Cheru et al., 2019). SSA's high economic growth without broad-based welfare gains is not a historical anomaly; in today's high-income countries, there has generally been a lag from growth to broad-based development (Frankema & van Waijenburg, 2018).

In order for growth to have a substantial impact on poverty, it must be accompanied by a structural transformation based on the transfer of labor from low- to high-productivity sectors and on labor productivity growth. The historical evidence suggests that all countries that have transformed into high-income countries have experienced structural transformation (Kuznets, 1966; Chenery & Syrquin, 1975) and that achieving such transformation is the only sustainable pathway out of poverty (Barrett et al., 2010). Historically, the transfer of labor from low- to high-productivity sectors has implied a transfer from the agricultural sector to the manufacturing sector. However, this clear sectoral boundary may now be blurring with the rise of high-productivity agricultural and service activities (Cheru et al., 2019).

The structural transformation links to the third aspect of the sustainability of the current growth process: the nature of agricultural growth. A key concern about the sustainability of the current growth

episode is whether it is merely driven by the export of cash crops (or, in some cases, minerals) and favorable terms of trade. If so, the episode would share similarities with the previous growth episode in the 1950s and 1960s, which ultimately was not sustained. Instead, broad-based, inclusive growth that benefits large segments of society is necessary for sustained growth (Andersson & Andersson, 2019). The limited success in increasing agricultural productivity and achieving an agricultural transformation in many African countries has led some researchers to question whether agriculture can generate sufficient growth to play a leading role in African development (Collier & Dercon, 2009, 2014; Dercon & Gollin, 2014). Several aspects of the transformative power of agricultural growth are questioned, including its efficacy in reducing poverty (Hasan & Quibria, 2004), whether it is a typical precursor of development (Ellis, 2004), and its ability to have strong growth linkages in today's globalized world (Hart, 1998). However, as Diao et al. (2010) show through the economy-wide modeling of six African countries, there is little evidence to suggest that contemporary low-income countries can bypass broad-based agricultural transformation in order to achieve successful and sustained economic transformation.

While it is well beyond this book (and most social scientists) to predict the economic future of any one country, certain elements can indicate whether a growth process is likely to be sustained or not based on historical experience. If growth is accompanied by structural change, a successful agricultural transformation, and welfare gains for a large part of the population, it is more likely to be sustained (Kuznets, 1966; Barrett et al., 2010; Valdés & Foster, 2010). This also applies to contemporary low-income countries in SSA. While some work on economic development in SSA engages in "African exceptionalism," this book sees no reason to consider the African continent as different from the rest of the world (for a discussion of this issue, see Cramer et al., 2020). All the countries in SSA are on their own development paths, as were all contemporary high-income countries. Some of the challenges of contemporary low-income countries are similar to those that today's high-income countries once faced, while others are unique to the current era. Nevertheless, as other parts of the world have achieved sustained economic growth once the right obstacles were removed and a sufficiently permissive environment was created, so could contemporary low-income countries in SSA.

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PART II

CHAPTER 5

Case Study Context: Ethiopia

Abstract In this book, Ethiopia is used as a case study to understand the role that the agricultural sector can play in economic growth in a low-income country. Ethiopia is not intended to be interpreted either as a representative or as a unique case for the broader sub-Saharan Africa (SSA) experience, but the book instead intends to shed light on Ethiopia's particular development experience. To contextualize the findings of the research, this chapter therefore discusses some key elements of Ethiopia's rich economic, political, and agricultural history.

Keywords Ethiopia • Economic context • Political context • Agricultural context

While Ethiopia is often portrayed as unique in the African setting—given its limited history of foreign occupation, long history of state centrality, relatively large population, and highland geography—it is not inherently more unique than any other African state. All African states have their own historical record and have been formed by the interaction of local and external factors (Bayart, 1993; Andersson, 2018). In light of this, the case of Ethiopia is not intended to be interpreted either as a representative or as a unique case for the broader SSA experience. Instead, it is intended to be a country-specific study shedding light on Ethiopia's particular

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development outcomes. Therefore, to contextualize the findings of this research, the following sections outline some key elements of Ethiopia's rich economic, political, and agricultural history.

Economic Context

While Ethiopia has a near-millennium long history with the Imperial Regime dating back to 1200s, Ethiopia in its roughly current form can be seen to start under Emperor Menelik II, in power 1889–1913 (Young, 1998). This period saw a strengthening of infrastructure and communications, education, and the taxation system, as well as the development of Addis Ababa as the new capital of the Empire (Greenfield, 1965). There was also a modernization of the political apparatus, with the establishment of the country's first ministries in 1907 (Shiferaw, 2019). Together, these improvements mark a transformation toward the modernization of the Ethiopian economy around the turn of the twentieth century. In addition, unlike many other countries in SSA, Ethiopia was also relatively outward-oriented during this time, continuing to trade in goods that it had been trading for centuries—such as gold, hides, ivory, salt, and luxury textiles—as well as expanding its trade in cash crops, and especially coffee (Wubneh, 1993).

However, despite these improvements, the economy was still highly traditional and centered on traditional agricultural practices. The trading sector did not expand into a large sector of the economy, and most of the trade that took place was carried out by Arab, Greek, and Armenian traders rather than traders from Ethiopian ethnic groups (Wubneh, 1993). Traditional agriculture, dependent on age-old plow-oxen technology, was the mainstay of the economy, with trade and crafts only playing a small role. As only a small part of the population was participating in the monetized economy, transactions were conducted mainly by barter and through crude media of exchange (Shiferaw, 2019). Wage labor remained limited, economic units were largely self-sufficient, foreign trade was of limited size, and the market for manufactured goods was very small (Wubneh, 1993). As such, throughout the nineteenth century, the Ethiopian economy can be classified as remaining near-feudal, despite some steps toward economic modernization at the end of the century.

The land tenure system can be identified as one aspect that was holding back the transformation of the Ethiopian economy up until and throughout the nineteenth century. The tenure system was highly complex, based

on a system of a landed gentry and heavy-handedly steered by the royal family, the church, and the military (Abegaz, 2004). Most land was controlled by the state or feudal lords and most citizens were tenants on this land (Jemma, 2004). Land tenure and landholdings were highly politicized as the Crown's distribution of land to both the nobility and peasants was at the core of the political power play, and the Emperor's claim to the throne. In addition, the provision of land grants to Ethiopia's historically powerful military was one of the main mechanisms the Crown used to secure control of Ethiopia's peripheries beyond the Northern highlands (Chinigò & Faniti, 2015). In this system, the most important revenue streams for the rulers remained the tributes (in kind and in labor) that they raised from their subjects (Shiferaw, 2019). In light of the domination of the traditional agricultural sector and the near-feudal arrangement of the economy, most of the country's population remains exposed to the vagaries of nature throughout the nineteenth century. This is exemplified by, for example, the devastating Great Ethiopian Famine in 1888–1892, where a third of the population are estimated to have died (Pankhurst, 1966).

Ethiopia remained marked by a traditional economic structure centered on ox-plow agriculture well into the twentieth century, and little efforts were made to alter this before the 1950s. Under the last Emperor of the Imperial regime (Emperor Haile Selassie I, in power 1930–1974 apart from the Italian occupation 1936–1941), more efforts were made to move away from the subsistence economy to a more modern economy, based on a modern agricultural sector and a growing industrial sector. This led to the adoption of the first national five-year plan in 1957. The five-year plans aimed to transform Ethiopia into a modern economy through the strengthening of infrastructure, communications, education, health care, and public services (Wubneh, 1993).

However, due to misguided policies, poor provision of public goods, and a protracted civil war, economic progress was limited throughout the twentieth century too, both under Haile Selassie and under the communist Derg regime that violently overtook power in 1974, and remained in power until 1991. This left Ethiopia a war-torn and famine-plagued country when the Ethiopian People's Revolutionary Democratic Front (EPRDF) took over from the transitional government (1991–1994) in the early 1990s (Cheru et al., 2019; Manyazewal & Shiferaw, 2019; Shiferaw, 2019). Since then, the country has seen a strong economic recovery in the 1990s, followed by 20 years of nearly uninterrupted growth (apart from the drought year of 2003) in the twenty-first century. Since 2003, GDP

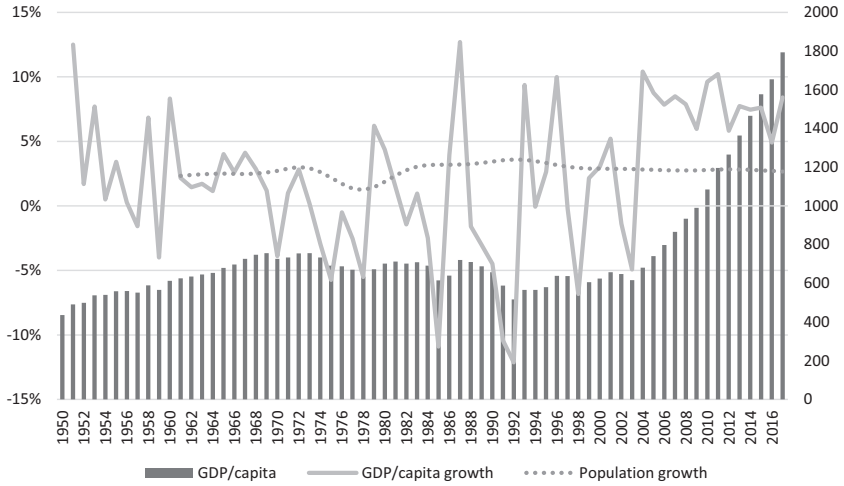

Fig. 5.1 GDP per capita growth and population growth (annual %; left axis) and GDP per capita (2011 constant USD, PPP; right axis). (Source: Author's calculation based on PWT 2020 (Feenstra et al., 2015) and TED 2020 (The Conference Board, 2020))

per capita growth has been steady, and the average GDP per capita growth for 2000–2018 was 6.3%, compared to 0.8% in the 1951–1999 period (Fig. 5.1).

Ethiopia's recent economic growth has been accompanied by the tripling of GDP per capita since the early 1990s, a fall in extreme poverty (living on under 1.90 USD/day) from 69% in 1995 to 32% in 2015, a fall in the mortality rate under 5 years old from 170 per 1000 live births in 1995 to 50 in 2019, and an increase in life expectancy from 49 years in 1995 to 66 years in 2018 (World Bank, 2021). However, despite the recent growth, the Ethiopian economy remains poor, agrarian, rural, and at an early stage of economic development. Over 70% of the population still live under the 3.20 USD/day poverty line. Moreover, the agricultural sector accounts for 33% of GDP compared to 5% for manufacturing, and 80% of Ethiopia's 112 million inhabitants live in rural areas (World Bank, 2021).

In terms of the structural transformation, production has shifted from agriculture toward the service sectors rather than manufacturing, and the employment transformation is slow (Martins, 2018). The economic

transformation has been challenged by the difficulty of establishing an internationally competitive manufacturing sector, managing the balance-of-payments problems of the government's ambitious development plans, curbing food inflation, and raising the living standards of Ethiopians (Schmidt et al., 2018; Cheru et al., 2019). Given this uneven record, it remains to be seen whether the government's aim of transforming Ethiopia into a middle-income country by 2025 will be fulfilled.

In the twenty-first century, many countries across SSA have experienced similar development paths as Ethiopia. Points of commonality include rapid economic growth compared to the "lost decades" of the 1980s and 1990s, growing agricultural output and productivity, an improvement of GDP per capita despite population growth, and a generally limited structural transformation, at least toward the manufacturing sector (Grabowski, 2014; Wiggins, 2018; IMF, 2020). However, even in this comparative context, the Ethiopian experience is rapid—the country's economic growth has been the fastest in the region since 2000 (Table 5.1), and its agricultural output has increased six-fold (Rohne Till, 2021) rather than doubled as in many other SSA countries (Wiggins, 2018). While this growth has taken place from a low base, the Ethiopian GDP per capita is now among the mid-performers in this sub-sample of fast SSA growers, at rank 10 out of 20 (Table 5.1). Moreover, Ethiopia is ranked 25th out of the 45 SSA countries in IMF's (2020) World Economic Outlook database.

Political Context

The political environment in Ethiopia cannot be properly understood without an appreciation of the state's particular history. The Ethiopian state has a different political legacy than its fellow countries in SSA, with its almost millennium-long history of state formation and no history of being colonized by a European power except for the brief Italian occupation of 1936–1941. A key feature of Ethiopia's internal politics is the historical tension between sources of power, with political power centered in the country's northern highlands and economic power centered in the southern and western regions, which were incorporated into the Empire in the 1800s. This internal tension has made it difficult to build strong nationwide statehood in the country. Under periods of stronger statehood during the Imperial and Derg regimes, the state's strength was often used for the economic exploitation of politically marginalized regions (Clapham, 2019; Shiferaw, 2019).

Table 5.1 GDP growth, GDP per capita growth, total GDP, and GDP per capita in the 20 fastest-growing SSA economies, 2000–2019

Country	*Average annual real GDP growth 2010–2019 (%)*	*Average annual real GDP growth 2000–2019 (%)*	*Average annual real GDP per capita growth 2000–2019 (%)*	*Total GDP (nominal) in 2019 (billion USD)*	*GDP per capita in 2019 (US$, PPP)*
Ethiopia	9.5	9.1	6.1	92.8	2724
Rwanda	7.6	7.6	4.6	10.1	2363
Ivory Coast	6.7	3.5	0.7	58.6	5327
Tanzania	6.7	6.5	3.4	60.8	2841
Djibouti	6.6			3.3	5195
Ghana	6.5	6.0	3.0	67.0	5688
Guinea	6.2	4.5	2.0	13.8	2506
DR Congo	6.1	4.7	0.7	49.8	1015
Niger	5.9	5.1	1.1	12.9	1276
Burkina Faso	5.7	5.7	2.5	15.7	2282
Togo	5.6	3.6	0.8	5.5	1657
Kenya	5.6	4.6	1.9	95.4	4985
Mozambique	5.4	6.5	3.4	15.2	1302
Senegal	5.3	4.6	1.8	23.6	3536
Uganda	5.2	6.5	3.0	36.5	2646
Benin	5.1	4.5	1.5	14.4	3423
Seychelles	4.6	3.4	2.2	1.7	30,430
Cameroon	4.6	4.2	1.5	38.9	3856
Sierra Leone	4.4	7.0	3.2	4.2	1778
Mali	4.3	4.9	1.6	17.3	2508

Source: Author's calculation based on IMF (2020)

The current regime has attempted to solve this tension through a federal system. In 1995, the government adopted a national constitution based on ethnic federalism, which grants self-determination to Ethiopia's almost 100 different nations and nationalities. Under ethnic federalism, the government has been able to stabilize power and provide security and control over its fragmented territories to a greater extent than its predecessors (Cheru et al., 2019; Clapham, 2019). Nevertheless, political tension remains rife in the country. The first decade of the federalist era was generally seen as a period of increased political stability and strengthening of Ethiopia's budding democracy. However, there was a backslide following the turmoil of the first general election in 2005 and the massive repression of the opposition (Nega, 2010).

The federalist government itself views its pursuit of state-directed development under authoritarian rule as an attempt at being an East Asian-inspired "developmental state," as explicitly discussed by former Prime Minister Meles Zenawi (2012). Along with Rwanda, Ethiopia represents the most explicit attempt to implement the idea of a "developmental state" in SSA (Clapham, 2018). This approach is marked by state intervention in many areas of the economy and the market, high levels of public spending, and a strong developmental vision for the nation (Chinigò & Faniti, 2015; Chang & Hauge, 2019).

While the Ethiopian iteration of the developmental state shares several characteristics with its East Asian counterparts, Chang and Hauge (2019) identify two main differences. First, they observe more fragile and fragmented public support for the state's development project, most likely linked to Ethiopia's ethnic fragmentation and related tension. Second, they note that Ethiopia's bureaucracy is weaker than those of many East Asian role models. The lack of public support and the many instances of political turmoil, civil unrest, and conflict under the EPRDF regime pose a real challenge to the continued developmental state project and the well-being of the Ethiopian people.

Ethiopia's stability and security problems are severe, not least reflected in the current conflict in the region of Tigray, where thousands have been killed, hundreds of thousands are facing famine as a consequence of the conflict, and two million people are estimated to have been forced to flee their homes (BBC, 2021; EHRC, 2021; Reuters, 2021; UNHCR, 2021). The conflict has been ongoing since November 2020, following the regional election in Tigray in September 2020. The election was held in defiance of the federal government, which led the federal government to launch a military offensive against the region. The conflict has since escalated into a civil war, where the main opposing sides are the Tigray Defense Forces and the Ethiopian National Defense Force, with the involvement of the Eritrean Defence Forces (CFR, 2022). The current situation is violent and unstable, war crimes have been reported to have been committed by both sides, and there are reports of unabated violence against civilians and of ethnic cleansing against Tigrayans (CFR, 2022; EHRC, 2020; Gavin, 2021; Walsh, 2021).

While the immediate trigger for the civil war was the regional election in Tigray in 2020, ethnic-linked tension has long historical roots in Ethiopia. The tension between the leading party in Tigray—the Tigray People's Liberation Front (TPLF)—and the federal government has been growing since Prime Minister Abiy Ahmed's win in the national election

in 2018. Prior to this win, the TPLF had dominated Ethiopia's ruling coalition under the EPRDF for 27 years, despite Tigray representing only 6% of the total population (CSA, 2010; CFR, 2022). EPRDF's toppling of the Derg regime in 1991 was led by (PM-to-be) Meles Zenawi, who comes from the TPLF, and since then, ethnicity has been increasingly politicized in Ethiopia. Under the rule of Zenawi (1991–1995 as president, and 1995–2012 as prime minister), ethnicity was constitutionally recognized and institutionally accommodated under the frame of "ethnic federalism." While the federal system may have solved some of the country's issues in terms of ethnic-based inequities, research suggests that the system may also have created new problems of ethnic tensions and conflict across Ethiopia (Bayu, 2022). Other scholars highlight that the current ethnic conflict is not only a byproduct of multinational federalism and politicization of ethnicity since 1991, but instead have longer historical roots. In this view, the forceful integration of the country's southern parts under Emperor Menelik II (and continued under Haile Selassie's rule) is identified as the root cause for today's ethnic tension (Assefa, 2022). Regardless of the timing of the origin of ethnic tension, the ongoing war is taking a devastating toll on the people of Ethiopia. Civilians are faced with violence, famine, communication blackouts, destroyed infrastructure, and there are reports of extrajudicial killings, mass atrocities, and sexual violence—and to date there are few signs of an improved security situation (CFR, 2022). Rapid efforts to stabilize the situation are therefore crucial for the safety and wellbeing of those affected by the war.

From a wider lens, stabilization of the political and security situation is also needed for continued economic growth. While tension and conflict have historically been part of many countries' paths to prosperity and are often features of capitalist expansion (Cramer et al., 2020), periods of political instability have been linked to economic shrinking in African economic history (Broadberry & Gardner, 2019). In Ethiopia, economic growth has previously been able to continue despite periods of political turmoil, such as in the aftermaths of the 2005 elections and the state of emergency from 2016 to 2018. While not diminishing the plight of marginalized ethnic groups, rural inhabitants that have lost their land, urban workers that have no right to unionize, and others who have suffered from the oppressive political system—prior to the current war, economic growth has been possible despite the political situation. However, given the severity of the current war, this may not be the case going forward, and its resolution is of crucial importance also for the country's economy—in addition to the safety and wellbeing of its people.

Policy Context

In terms of policy, the Ethiopian government's pursuit of the agricultural development-led industrialization (ADLI) development strategy is a key concern for this study on the role of agricultural growth in aggregate growth. ADLI is a macro-level development policy that aims to generate fast agricultural growth to improve national food security and stimulate economic growth through forward and backward economic linkages (MOFED, 2003). First implemented in the early 1990s, the strategy considerably strengthened in 2002 and has been reaffirmed in subsequent development plans (MOFED, 2002, 2003, 2005, 2010, 2015). While the Ethiopian policy is not a direct application of Adelman's (1984) academic concept, the two share many similarities. The Ethiopian strategy prescribes an array of regulatory, trade, and market policies, including a key policy to greatly increase agricultural public spending. Under ADLI, the Ethiopian government has dedicated a significant share of its public spending to agriculture (Fig. 5.2). In its first decade, ADLI was implemented with a relatively narrow focus on providing off-the-shelf fertilizer packages, improving access to inputs and credit, and providing extension services. While agricultural production increased during this period, ADLI was

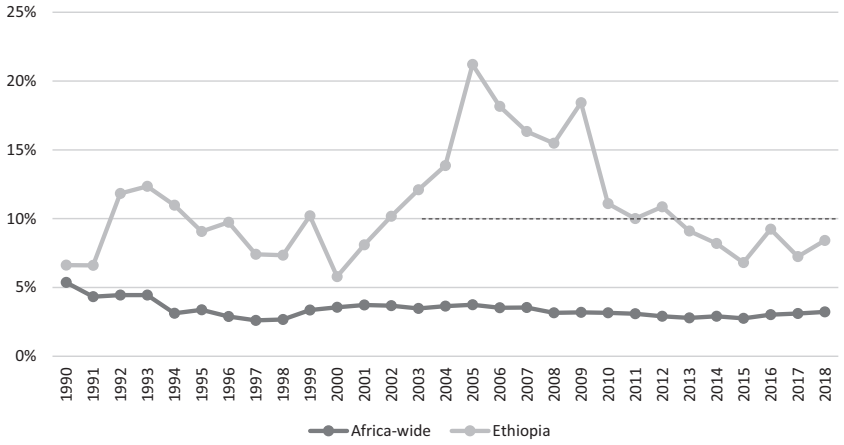

Fig. 5.2 Agricultural public spending as a share of total public spending, Ethiopia and African average 1990–2018. (Source: ReSAKSS (2021). Note: The dashed thin line represents the Maputo commitment since 2003 to spend minimum 10%)

reformulated in 2002 with the aim of improving its results for both agricultural and aggregate growth (MOFED, 2002).

Since then, ADLI has also included efforts to improve the broader market environment, reduce poverty, and combat food insecurity. This includes an increased focus on the commercialization of smallholder agriculture, an expanded role for large-scale agriculture, increased support for infrastructure and rural welfare, and interventions tailored to address the specific needs of the country's varied agro-ecological zones (MOFED, 2002; FAO, 2003). While the ADLI strategy is still a component of the Ethiopian policy framework, the 2015–2020 five-year plan downplayed agriculture as the economy's leading sector compared to previous plans, in favor of a greater focus on industry and manufacturing (MOFED, 2015).

In the last two decades, many countries in SSA (e.g., Uganda, Rwanda, Ghana, and Malawi) have assigned a larger role to agriculture in policy. While this commitment appears to have been mainly rhetoric in some countries, Ethiopia is one of the few countries that have met the Maputo commitments in most years (Benin & Yu, 2013; Grabowski, 2014). The Ethiopian commitment has also seen a broader range of agricultural public spending, whereas some other countries (especially Malawi) have channeled the bulk of agricultural public spending through input subsidy programs (Ghins et al., 2017; Hemming et al., 2018). Therefore, the Ethiopian policy commitment to the agricultural sector under ADLI is not unique to Ethiopia, although the centrality of the agricultural sector in the country's development strategy may be particularly pronounced.

Agricultural Context

Historically, the agricultural sector has been at the core of Ethiopia's economy. In the 1960s, the agricultural sector still accounted for over 85% of production and over 95% of the population (Timmer et al., 2015). As mentioned above, there has since been a structural shift in terms of production, while the labor force is still predominantly engaged in agriculture. Historically, Ethiopian agriculture has been rain-fed, drought-prone, and traditional, leading to several instances of famine. The sector is still predominantly rain-fed (only 3% of Ethiopia's arable land is irrigated) and drought-prone (2016 saw the latest major drought) (FAO, 2016; FAOstat, 2021). However, many aspects of the sector are no longer traditional. Fertilizer use has increased four-fold since the early 1990s, the uptake of mechanization is increasing (albeit from a low level), and the country's

large extension program is disseminating modern farming techniques (Davis et al., 2010; Rashid et al., 2013; Berhane et al., 2017).

The sector is dominated by cereal production and small farms. From 1995 to 2018, the total production of all crops in Ethiopia increased from 704,180 tons to 4,527,240 tons, out of which the cereal sector accounted for 87% of total agricultural production in 1995 and 59% in 2018 (CSA, 1995–2018). The agricultural sector in Ethiopia has undergone a tremendous production and productivity increase since the mid-1990s, with a six-fold increase in agricultural production, doubling of yields for the most important crops, and emerging labor productivity improvement (Rohne Till, 2021).

Most of Ethiopia's agricultural production is attributed to smallholder farmers. The country is dominated by small farms; smallholders account for over 95% of production and arable land (CSA, 2011–2013). The average farm size in Ethiopia is 1 ha. Moreover, 75% of all Ethiopian farms are smaller than 1.95 ha, and the average size of this subset is 0.78 ha (Headey et al., 2014; FAO, 2020). Larger farms (e.g., cooperatives, state farms, and private commercial farms) make up less than 5% of Ethiopian farms and play a limited role in most of the agricultural production apart from specific industries such as tea, sugarcane, and horticulture (Taffesse, 2019). Most farms primarily rely on family labor. While the use of hired labor is common, especially for weeding and harvesting, its share of total deployed labor is small; wage income, on average, accounts for only 10% of household income in rural areas (Bachewe et al., 2016). This relatively small share of wage income indicates agricultural production's importance to rural incomes and livelihoods in Ethiopia.

A key question linking agricultural production to economic growth is whether small Ethiopian farms are large enough to grow themselves out of poverty in the virtuous cycle envisioned by ADLI and the general agriculture-for-development strategy. While the data on agricultural production shows that both total production and yields have increased in recent decades, the number of farmers has increased more than land expansion. This has led to smaller farms; the average farm size decreased from 1.4 ha in 1977 to 1.0 ha in 2012 (Headey et al., 2014). The growing rural population, combined with a slow movement out of agriculture, likely contributed to this development.

The reduction in poverty headcount ratio from over 60% of Ethiopians living in extreme poverty (under 1.90 USD/day) in the 1970s and 1980s to about half that figure in 2016, as well as an improved level of daily

calorie intake, suggests that recent agricultural growth has benefited at least some smallholders (World Bank, 2021). However, there are at least two sub-groups of Ethiopian smallholders: (1) a group with access to relatively large plots located in areas with more favorable agro-ecological conditions and/or market connectivity, and (2) a group that does not have access to these favorable traits. The former group, which Mellor (2017) calls "small commercial farmers" (SCFs), is more likely than the latter to both drive and benefit from agricultural change. Mellor (2017) defines SCFs as rural households that have enough land to produce sufficient income to exceed the 1.90 USD/day poverty line, market most of their production, make almost all of their income from farming, and typically have access to farms sized 0.75–5 ha. These farmers make up 54% of the rural population in Ethiopia, using 77% of the land (Mellor, 2017). However, factoring in the small proportion of large-scale farmers, this implies that at least 40% of the Ethiopian rural population is stuck in near-subsistence farming. This group is likely unable to benefit significantly from the ongoing agricultural transformation. For the segment of the Ethiopian population that cannot grow themselves out of poverty, there is a need for other protective measures, such as safety nets, cash transfers, and public work programs.

Regional differences also influence who benefits from agricultural change. Previous research suggests that areas that are more connected have more successful agricultural improvements than remote areas, and the prospects for both production and commercialization vary widely between regions and locations (Wiggins, 2000; Andersson Djurfeldt & Djurfeldt, 2013; Andersson Djurfeldt, 2017). In Ethiopia, the central regions of Oromia and Amhara have accounted for the bulk of the increase in agricultural production (Rohne Till, 2021). These regions have likely benefited from their central location (close to the main market of Addis Ababa), their favorable agro-ecological climate (Sebastian, 2014), and their comparatively larger farms (Rohne Till, 2021).

In contrast, regional characteristics leave marginal areas at greater risk of stagnant or even falling agricultural productivity, which may push the inhabitants of such regions into labor-intensive, poorly remunerated, non-farm livelihoods (Hazell et al., 2007). While the majority of the Ethiopian population resides in Oromia (33 million) and Amhara (27 million), more than a third of Ethiopians live elsewhere. This group may not benefit sufficiently from the macro-level improvement of agricultural production and productivity to grow themselves out of poverty. Safety net spending was

prioritized in Ethiopia in the early 2000s. This spending was mainly channeled as food aid and cash transfers through two large programs: the Household Asset Building Programme and the Productive Safety Nets Programme (World Bank, 2008; FAO, 2014). However, this spending has since decreased (Rohne Till, 2021). Given that a large share of Ethiopians may be too poor to be successful commercial farmers, future economic growth and poverty reduction will likely require government interventions to support agricultural productivity growth and protect poor rural households (Abro & Alemu, 2014).

Agricultural and Economic Growth in the Twenty-First Century

The main period under investigation in this book's empirical section (Part III) is 2002–2010. In this period, real GDP per capita growth averaged 5.9%, agricultural production of all grains (cereals, pulses, and oilseeds) grew at an annual average rate of 8.1%, and agricultural public spending as a share of total spending averaged 18.9% (CSA, 2002–2010; Feenstra et al., 2015; ReSAKSS, 2021). In terms of agricultural policies, the commitment to the agricultural sector was particularly pronounced during 2002–2015. This strengthened commitment followed a reformulation of and recommitment to ADLI in 2002 and continued until the central role of agriculture was downplayed in the Growth and Transformation Plan II in 2015 (MOFED, 2002, 2015).

The substantial increase in agricultural production has also been accompanied by improvements in agricultural productivity, both in land and in labor. In terms of land, the average cereal yield increased from 0.97 metric tons/ha in 1994 to 1.36 in 2002, 1.83 in 2010, and 2.83 in 2019 (FAOstat, 2021). In terms of labor productivity, apart from the drought in 2003, the 2002–2010 period saw strong labor productivity increases in agriculture, although the industrial sector has seen the most rapid labor productivity growth in recent years (Fig. 5.3). While there is no consensus on the specific mechanisms that have driven the increases in agricultural production and productivity, several studies suggest that high government spending on agriculture has been an important contributing factor (World Bank, 2016; Bachewe et al., 2018; Grabowski, 2020; Rohne Till, 2021). In addition, the period has also seen rather substantial improvements in infrastructure, albeit from low levels (Minten et al., 2014; World Bank, 2016). These improvements may have spurred the

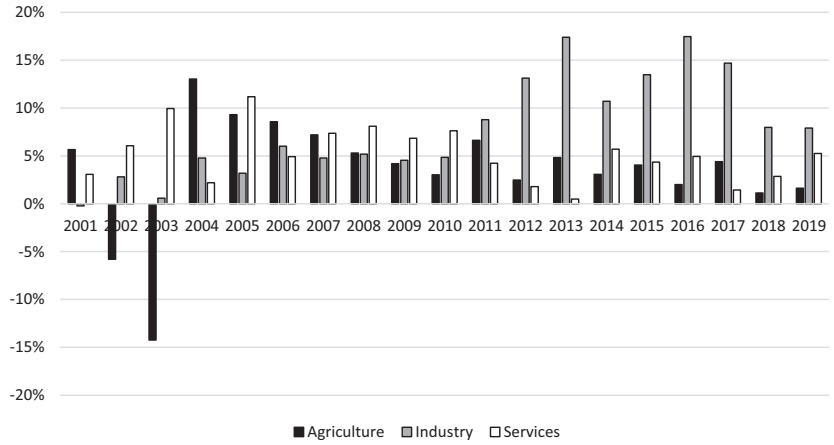

Fig. 5.3 Labor productivity growth per sector (annual % change of value added per worker). (Source: Author's calculation based on World Bank (2021))

agricultural transformation by increasing (product and factor) market connectivity. Moreover, they may have supported the development of time-sensitive agricultural sub-sectors, such as flowers and fruits.

The economic and agricultural growth in the last 20 years has been accompanied by structural change in production but not in employment. The share of agricultural value added to total value added decreased to 41% in 2011 and 34% in 2019, while employment remain high at 73% in 2011 and 66% in 2019 (Table 5.2). The expansion of the industrial sector that can be seen in Table 5.2 is due to a construction boom across the country, largely financed by government spending (World Bank, 2016; PSI, 2020). The service sector has also expanded significantly. It is a highly heterogeneous sector, including both high-tech, capital-intensive enterprises such as Ethiopian Airlines and the financial sector as well as petty traders (PSI, 2020).

Similar patterns of structural transformation have been observed in many of the countries in SSA currently undergoing economic growth. This trend notably differs from the historically important role of the manufacturing sector in both output and employment during economic growth. In the past, the manufacturing sector has been a very successful engine of growth for low-income countries; it is a technologically dynamic

Table 5.2 Sector composition in Ethiopia, 1961–2019 (%)

	1961	*1971*	*1981*	*1991*	*2001*	*2011*	*2019*
Share of value added							
Agriculture	81%	75%	71%	64%	48%	41%	34%
Manufacturing	2%	3%	4%	4%	6%	4%	6%
Other industry	6%	6%	5%	6%	7%	10%	24%
Services	11%	16%	20%	26%	38%	41%	37%
Share of employment							
Agriculture	96%	92%	89%	90%	85%	73%	66%
Manufacturing	0.2%	0.4%	0.3%	0.5%	1%	3%	10%
Other industry	1%	2%	2%	2%	3%	7%	
Services	2%	6%	9%	8%	11%	16%	24%

Source: Timmer et al. (2015) for 1961–2001; World Bank (2020) for 2011–2019

Note: Percentages may not sum up to 100 due to rounding

sector producing tradable goods that can also provide employment to a significant share of the population (Rodrik, 2013). However, in Ethiopia and in other SSA countries, very little labor has been absorbed into the sector. This may be due to the advent of labor-saving automation and high-skill technologies used in manufacturing, which have made it difficult to produce internationally competitive manufacturing goods based on low-cost labor (Rodrik, 2016, 2018). As a result, the manufacturing sector in SSA has not been able to generate a high share of formal employment in Ethiopia and other countries in SSA. This stands in stark contrast to the development of, for example, the fast-growing East Asian economies (Diao et al., 2021).

The nature of the structural transformation in Ethiopia is likely linked to the economy's productivity patterns. On the one hand, labor productivity growth has been higher in the industrial sector than in other sectors in Ethiopia since 2011 (Fig. 5.3) and has persistently been substantially higher than in agriculture (Fig. 5.4). On the other hand, the productivity levels both in the industrial sector overall, and specifically within the manufacturing sector, are low when compared with those of other low-income countries (PSI, 2020). While some observers are optimistic that the Ethiopian manufacturing sector may come to play a larger role in employment, output, and exports going forward (Oqubay, 2018), this has not yet been the case (Diao et al., 2021).

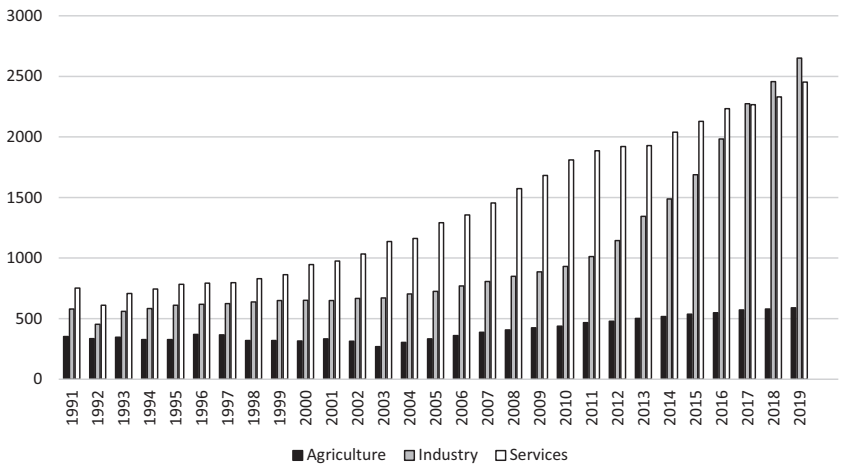

Fig. 5.4 Labor productivity per sector (value added per worker in constant 2010 US dollars). (Source: Author's calculation based on World Bank (2021))

A final note on the role of prices and inflation is needed to contextualize the present research's empirical study. The study period saw a highly volatile price environment, with inflation ranging from 44% in 2008 during the global price hike to deflation of -8.2% in 2001 following good harvests (Durevall et al., 2013; World Bank, 2021). During the global food price spike of 2008 (and the subsequent spikes in 2010/2011 and 2012), Ethiopia was one of the most affected countries. This marked a clear shift from earlier periods, when Ethiopia had low inflation apart from a limited number of war- or drought-induced inflation periods. The severe impact of the 2008 global price hike on Ethiopia's inflation was likely linked to both external (Durevall et al., 2013) and internal causes (Admassie, 2014). Food prices are very closely linked to inflation in Ethiopia and are highly sensitive to changes in the supply–demand balance, as both supply and demand are very price-inelastic in the short run (Pinstrup-Andersen, 2014; Admassie, 2014). In the economic multiplier model that this research applies in Part III, prices are treated in current prices in each year, and as such reflect the situation as it was that one year. However, as prices are fixed in the short run (in each year) but allowed to

change over the period of analysis (between the years), the study considers how inflation has affected the economic structure over the period of study without the price changes distorting the analysis.

The above contextualization of some key elements of Ethiopia's economic, political, and agricultural history has highlighted the particular setting in which the empirical findings of Part III should be understood. While the book aims to provide insights that could be relevant to other low-income countries in the initial phase of economic development, any such lessons should be drawn with caution. Current development trajectories are unlikely to repeat past experiences; all economies will not ultimately mirror those of now-rich countries. Therefore, rather than providing actionable "lessons" or a roadmap for development, the research seeks to offer evidence on the complexity of economic change and some specific elements of this complexity in the Ethiopian case.

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PART III

CHAPTER 6

Methodology

Abstract This chapter introduces the book's empirical investigation of the role that agricultural growth has played in aggregate economic growth in Ethiopia in the twenty-first century. This chapter describes the main method and data used for empirical investigation. It describes both the data contained in the three Social Accounting Matrices (SAMs) that form the book's main empirical data source, as well as the methodological proceedings of the Semi-Input-Output multiplier model that the book applies.

Keywords Social Accounting Matrix (SAM) • Semi-Input-Output (SIO) multipliers • Growth linkages

To explore the role of agriculture in Ethiopia's economic growth, this section quantitatively evaluates the country's changing agricultural growth linkages. It uses a Social Accounting Matrix (SAM)-based economic multiplier model to calculate the agricultural sector's growth linkages and compare them to the manufacturing sector. Along with econometric studies (Bravo-Ortega & Lederman, 2005; Tiffin & Irz, 2006; Self & Grabowski, 2007) and growth accounting studies (Martin & Mitra, 2001; Gulati et al., 2005; Bosworth & Collins, 2008), multiplier analysis is one of the main methods for assessing the role of agriculture in economic growth. The choice to use this method in the present study is made in light of the recognized limitations of growth accounting, which provides

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only a decomposition of the proximate sources of growth, and the difficulty of establishing convincing causal links through econometric studies (as discussed by Tsakok & Gardner, 2007).

The economic multiplier method allows us to address two specific questions: how large are the growth linkages of agriculture and manufacturing, and has their size changed over time relative to each other? Through these questions, the method can explore which sector was the best growth option at three snapshots during Ethiopia's economic growth in 2002, 2006, and 2010. This approach also allows us to get closer to the counterfactual question of which sector was the strongest growth engine at these points and therefore would have been the most appropriate sector to invest in. Given the historical record, we know that both the agricultural sector and the economy grew over the period of investigation. However, the economic multiplier method allows for a greater understanding of whether Ethiopia's agricultural growth was the main engine of its economic growth or whether the same (or higher) aggregate growth would have been generated had there been similar growth in the manufacturing sector instead. The method also tries to uncover whether the size of the growth linkages of agriculture and manufacturing have changed over time. Although 2002–2010 is a short time frame to observe significant economic change, it was a transformative period in the Ethiopian economy, representing a break toward higher economic growth than in previous periods. If successful industrialization was occurring in this period of economic growth—as theory and previous development experiences would suggest—then the multiplier analysis would show that the growth linkages from the manufacturing sector strengthened over time, while the agricultural growth linkages would shrink.

Data

To calculate growth linkages in an economy, information on the economy's production technologies and consumption patterns is needed. This information can be obtained via the construction of a SAM. A SAM is a summary table for a given period (often a year) that provides a coherent, detailed database on the production, incomes, consumption, investment, external trade, and other flows in the economy, revealing a country's economic structure. There is a large literature on the construction, usefulness, and application of SAMs (Pyatt & Round, 1979; Defourny & Thorbecke, 1984; Keuning & de Ruijter, 1988; Sadoulet & de Janvry, 1995;

Thorbecke, 2000; Round, 2003; Breisinger et al., 2009). Several studies have employed SAM-based multiplier analysis to examine how an income injection in one part of an economic system affects the economy (Hayden & Round, 1982; Bell & Hazell, 1980; Thorbecke et al., 1992; Powell & Round, 2000; Tarp et al., 2002). SAMs are usually studied for one year at a time due to the extensive work and data collection that is required to construct them. While the use of multiple SAMs is therefore somewhat uncommon, previous studies using SAMs for multiple years include Cohen (1989), Hewings et al. (1998), Lima et al. (2004), and Llop (2007); other studies have used SAMs for multiple countries, including Vogel (1994) and Arndt et al. (2012). The multiple SAMs available for Ethiopia during this period offer a unique opportunity to provide a detailed understanding of the relationship between agricultural and economic growth in a low-income country.

A SAM is an accounting framework represented as a square matrix in which each cell represents a flow of funds from a column account to a row account. A basic SAM structures the economy into seven types of accounts: activities, commodities, factors of production, households, government, savings and investment (S-I), and rest of the world (RoW) (Breisinger et al., 2009). In this structure, "activities" are the entities that produce goods and services, and "commodities" are the goods and services that activities produce. In most SAMs, including the SAM used here, the values in the activity accounts are measured in producer prices. Therefore, the SAM structure used also includes an eighth account for "margins," which include the marketing and transportation costs associated with commodity flows.

Three national Ethiopian SAMs are available from previous research, for 2002 (EDRI, 2008), 2006 (EDRI, 2009), and 2010 (Aragie, 2014).[1] As two of the previous SAMs were constructed by the Ethiopian Development Research Institute (EDRI), and the third is an updated version of the 2006 SAM, the SAMs share a similar structure and are suitable for comparison. The rich and detailed data contained in the SAMs are sourced from both macro and micro sources. The main data sources for

[1] A small SAM by Taffesse and Ferede (2004) for 1999/2000 and village-level SAMs by Ferede (2008) and Taye (1993) also exists but are not included, as they would not be comparable to the large SAMs in this study. A national 2011 SAM is also under construction under the Nexus Project. However, this study chose to use the 2010 SAM to keep the time intervals consistent between each SAM.

the 2002 SAM are national accounts statistics (MOFED, 2006), supply-use tables (MOFED, 2007), industry surveys (CSA, 2003a, 2003b, 2003c), agricultural census data (CACC, 2003), labor force survey data (CSA, 2006a), balance-of-payments statistics (CSA, 2004), and household survey data (CSA, 2001), as well as internal government revenue, government expenditure, and customs data files (EDRI, 2008). These were constructed as a square matrix of 133 × 133 cells in Excel containing information about 42 production activities, 61 commodity groups, five primary factors, two household groups, and 17 tax instruments, as well as aggregate accounts for trade margins, transport margins, government, investment, and RoW. The 2006 SAM is an extended version of the 2002 SAM that uses similar data sources, but is updated if available (EDRI, 2009). Updates include industry survey data (CSA, 2006b, 2006c, 2006d), agricultural census data (CACC, 2007a, 2007b), balance-of-payments statistics (CSA, 2006e), and household survey data (CSA, 2006f). The SAM is a square matrix of 255 × 255 cells containing information on 99 production activities, 91 commodity groups, five factors of production, 14 household groups, 17 tax instruments, and aggregate accounts for trade margins, transport margins, government, investment, and RoW. The 2010 SAM is an updated version of the 2006 SAM constructed by Aragie (2014). It updates the 2006 SAM with a new Household Consumption and Expenditure survey for 2011 and national accounts for 2011 and includes finer disaggregation between home production and marketed production. It is a square matrix of 236 × 236 cells containing information on 50 production activities, 39 commodity groups, 36 primary factors, 27 household groups, five tax instruments, and aggregate accounts for trade margins, transport margins, government, investment, and RoW (Aragie, 2014).

To make the three SAMs comparable, they were recoded into the same structure of eight activities, eight commodity groups, two factors of production, two household types, and aggregate accounts for margins, government, S-I, and RoW, as summarized in Table 6.1.[2] As such, the research is based on three SAMs, each structured into a 24 × 24 square matrix. The high level of aggregation into eight activities and commodities is implemented in order for the three SAMs to be comparable over time.

[2] Corporate enterprises are excluded from the SAMs for simplicity. As such, profits (gross operating surplus) are assumed to be paid directly to households (i.e., households' direct taxes include corporate taxes).

Table 6.1 Structure (accounts) of the 2002, 2006, and 2010 SAMs

	Account	*Code*	*Main sub-sectors included*
Activities	Agriculture	aagr	Production of cereals, cash crops, livestock, forestry, fishing.
	Food-processing	afpr	Production of meat, vegetable, dairy, sugar and sugar confectionery, animal feed, beverages (incl. alcohol) and tobacco, milling service activity, other food-processing.
	Manufacturing incl. mining	aman	Production of textiles, leather products, wood products, fertilizers, chemicals, mineral products, metals and metal products, motor vehicles, machinery and equipment, other manufacture, other mining products.
	Utility	auti	Fuel, electricity, water.
	Construction	acon	Construction.
	Trade and transport	atrad	Trade and repair services, hotels and restaurants, transport services, communication.
	Public services	apubs	Public administration, defense, education, health.
	Private services	aprvs	Financial services, recreation and other services, real estate and renting services.
Commodities	Agriculture	cagr	Cereals, cash crops, livestock, forestry and fishing products.
	Food-processing	cfpr	Meat, vegetable, dairy, sugar and sugar confectionery, grain mill, other food products, animal feeds, beverages (incl. alcohol) and tobacco products.
	Manufacturing incl. mining	cman	Textiles, leather products, wood products, fertilizers, chemicals, mineral products, metals and metal products, motor vehicles, machinery and equipment, other manufacture, other mining products.
	Utility	cuti	Fuel, electricity, water.
	Construction	ccon	Construction.
	Trade and transport	ctrad	Trade and repair services, hotels and restaurants, transport services, communication.
	Public services	cpubs	Public administration, defense, education, health.
	Private services	cprvs	Financial services, recreation and other services, real estate and renting services.
Margins	Margins	mar	Transport margins, trade margins.
factors	Labor	lab	Unskilled workers, skilled workers.

(*continued*)

Table 6.1 (continued)

	Account	*Code*	*Main sub-sectors included*
	Capital	cap	Agriculture capital and land, livestock capital, nonagricultural capital and land.
Households	Urban households	hurb	Urban poor households, urban non-poor households.
	Rural households	hrur	Rural poor households, rural non-poor households.
Institutions	Government	gov	Government, direct taxes, indirect taxes.
	Savings and investments	s-i	Savings, stock change.
	Rest of the world	row	Rest of the world.

Note: Following Arndt et al. (2012), the recoding was facilitated by standard industry/product classifications so that each account includes as similar information as possible. However, the mining sector is included in the manufacturing sector account because in the 2010 SAM to which this study has access, the mining and manufacturing sectors are grouped. As the mining sector is small in resource-poor Ethiopia, this is not expected to affect the overall results. In the 2002 SAM, the total supply of the mining sector was 765 million *birr* compared to the total supply in the manufacturing sector of 33,981 million *birr*; in 2006, it was 1023 million *birr* of a total of 62,734 million *birr*

Method

To capture the size and change of economic linkages in Ethiopia, the study calculates Semi-Input-Output (SIO) multipliers based on the three SAMs. SIO multiplier analysis is an economic model that assumes that all relationships in each SAM are linear and prices are fixed (in the short run). The work follows the guidelines for SIO multiplier analysis as outlined in Breisinger et al. (2009).

SIO multiplier analysis indicates the size of a sector's contribution to aggregate growth through its linkages with other sectors. It shows how much the overall economy would grow if one sector grows. This is estimated by calculating how much the overall economy would grow if one sector experienced an exogenous demand-side shock—for example, due to increased export demand, public spending, or aid—considering both the direct and indirect effects. The indirect effects are also called "demand linkages" and include backward and forward production linkages as well as consumption linkages. Together, the direct and indirect effects make up the total multiplier effect. The total size of a sector's growth linkages depends on the interdependencies among an economy's sectors in terms of production technologies and household consumption patterns.

To calculate the multiplier effect, the SAM accounts are divided into endogenous and exogenous accounts such that a change in the latter influences the former. In the model, the government, capital (S-I), and RoW accounts are treated as exogenous. As such, the model only considers two sets of agents (activities and households) interacting through two sets of markets (commodities and factors). The model also requires the classification of sectors into those with perfectly elastic supply and those that are supply-constrained. If demand for a supply-unconstrained sector increases, domestic output increases to match the increased demand. However, if demand for a supply-constrained sector increases, it is satisfied by imports. The degree of supply responsiveness in a sector depends on technological and resource constraints and the capacity to utilize available technologies and resources. In this study, two scenarios are modeled: one where agriculture is supply-unconstrained and another where agriculture is supply-constrained.[3] In both scenarios, the public service sector is treated as supply-constrained, which is consistent with the literature. All other sectors are treated as supply-unconstrained.[4]

The SIO multiplier analysis is used to simulate the insertion of equivalent investments leading to equal-sized demand increases in either the agricultural sector or the manufacturing sector for each of the three years. The exogenous injection represents increased demand from any of the exogenous accounts, such as increased public spending, increased investment demand

[3] It is a strong assumption to model the agricultural sector as supply-unconstrained given the numerous constraints on agricultural production in low-income countries, such as shortage of land, rainfall, input supply, and marketing infrastructure, as well as seasonal labor bottlenecks, limited soil fertility, and agro-climate constraints (Abrar et al., 2004; Ferede, 2008). However, while strong, it is not unreasonable to assume that agriculture in Ethiopia is not supply-constrained given its rapid growth during the period of investigation. To avoid biasing the results upwards by modeling the agricultural sector as only supply-unconstrained (as discussed by Haggblade et al., 1991), both specifications are included in the study.

[4] In regard to the manufacturing sector specifically, it may not always be appropriate to model it as supply-unconstrained in low-income settings given the common constraints of shortages of skilled labor, foreign exchange, and fixed capital (Diao et al., 2010). However, much literature highlights the special importance of the manufacturing sector as an appropriate growth engine in low-income countries due to its often relatively low capital and technology intensity and heavy use of low-skilled labor (Rodrik, 2016). In addition, previous studies have indicated that capacity utilization in Ethiopian manufacturing is low and that there exist slack resources that could be pulled into production (Diao et al., 2007). To avoid underestimating the potential growth linkages of the manufacturing sector in Ethiopia, the sector is modeled as supply unconstrained.

from either domestic or international capital, or foreign aid.[5] The resulting multiplier effect reveals how much the economy would grow—given its production technologies and consumption patterns in the year described by the SAM—if one sector experienced such an exogenous demand-side shock. It does not attempt to explain why such a demand-side shock would occur, nor why some sectors respond more or less than others. Instead, it gives a numerical description of how an exogenous inflow into one sector would affect the other sectors in the economy once the structural (demand and supply) interconnections are fully taken into account. To calculate the total multiplier effects, the SIO model uses matrix algebra. The equations are detailed below, and the equation legend is provided in Table 6.2. The equations are developed based on the guidelines in Breisinger et al. (2009).

Table 6.2 Equation legend, values and shares

Values		*Shares*	
X	Gross output of each activity	a	Technical coefficients
Z	Total demand for each commodity	b	Share of domestic output in total demand
V	Total factor income	v	Share of value added or factor income in gross output
Y	Total household income	l	Share of value of total demand from imports/ commodity taxes
E	Exogenous components of demand	c	Household consumption expenditure shares
		s	Household savings rate

$$\begin{aligned} Z_1 &= a_{11}X_1 + a_{12}X_2 + c_1Y + E_1 \\ Z_2 &= a_{21}X_1 + a_{22}X_2 + c_2Y + E_2 \end{aligned} \tag{1}$$

$$\begin{aligned} Z_1 &= a_{11}b_1Z_1 + a_{12}b_2Z_2 + c_1\left(v_1b_1Z_1 + v_2b_2Z_2\right) + E_1 \\ Z_2 &= a_{21}b_1Z_1 + a_{22}b_2Z_2 + c_2\left(v_1b_1Z_1 + v_2b_2Z_2\right) + E_2 \end{aligned} \tag{2}$$

[5] While financing channel is likely to influence the real-world effects of demand increases (Rocchi et al., 2013), it is not possible to distinguish the exogenous account from which the increased demand originates in the SIO multiplier analysis. In this study, the increased demand is treated conceptually as originating from increased public spending; the study assumes that the increased demand originates from government spending under a chosen development strategy. Furthermore, as discussed, for example, by Thorbecke (2018), even if one accepts that the formulation of economic policy is largely endogenous rather than exogenous in the real world (influenced by the political balance of power and existing institutions, etc.), this type of analysis can still play an important role in informing strategic planning.

$$\begin{aligned} Z_1 - a_{11}b_1Z_1 - c_1v_1b_1Z_1 - a_{12}b_2Z_2 - c_1v_2b_2Z_2 &= E_1 \\ -a_{21}b_1Z_1 - c_2v_1b_1Z_1 + Z_2 - a_{22}b_2Z_2 - c_2v_2b_2Z_2 &= E_2 \end{aligned} \tag{2}$$

$$\begin{aligned} \left(1 - a_{11}b_1 - c_1v_1b_1\right)Z_1 + \left(-a_{12}b_2 - c_1v_2b_2\right)Z_2 &= E_1 \\ \left(-a_{21}b_1 - c_2v_1b_1\right)Z_1 + \left(1 - a_{22}b_2 - c_2v_2b_2\right)Z_2 &= E_2 \end{aligned} \tag{3}$$

$$\begin{pmatrix} 1 - a_{11}b_1 - c_1v_1b_1 & 0 \\ -a_{21}b_1 - c_2v_1b_1 & -1 \end{pmatrix}\begin{pmatrix} Z_1 \\ E_2 \end{pmatrix} = \begin{pmatrix} 1 & a_{12}b_2 + c_1v_2b_2 \\ 0 & -1 + a_{22}b_2 + c_2v_2b_2 \end{pmatrix}\begin{pmatrix} E_1 \\ Z_2 \end{pmatrix} \tag{4}$$

$$\begin{pmatrix} 1 - a_{11}b_1 - c_1v_1b_1 & 0 \\ -a_{21}b_1 - c_2v_1b_1 & -1 \end{pmatrix} = I - M^* \tag{4.1}$$

$$\begin{pmatrix} 1 & a_{12}b_2 + c_1v_2b_2 \\ 0 & -1 + a_{22}b_2 + c_2v_2b_2 \end{pmatrix} = B \tag{4.2}$$

$$\left(I - M^*\right)\begin{pmatrix} Z_1 \\ E_2 \end{pmatrix} = B\begin{pmatrix} E_1 \\ Z_2 \end{pmatrix} \tag{4.2}$$

$$\begin{pmatrix} Z_1 \\ E_2 \end{pmatrix} = \left(I - M^*\right)^{-1} B\begin{pmatrix} E_1 \\ Z_2 \end{pmatrix} \tag{5}$$

The final SIO multiplier equation (5) shows that an exogenous increase in demand for the unconstrained sectors (E_1) leads to a final increase in total demand for these sectors (Z_1), including all of the forward and backward linkages ($(I\text{-}M^*)^{-1}$). However, the exogenous demand for constrained sectors (E_2) is leaked to imports (because the final demand for the supply-constrained sectors (Z_2) is met through increased imports), eliminating any linkages for those sectors. The information regarding linkage effects from the SAM is incorporated into the multiplier model through the coefficient matrix M.

The above equations calculate accounting multipliers based on average patterns, not "fixed-price" multipliers based on marginal responses (despite the name, note that both multipliers are formally "fixed-price," as prices are fixed in the short run). While "fixed price" multipliers may be conceptually closer to the underlying reality, as the marginal responses in the system may be different from the average one, Pyatt and Round (1979) compared computations for both types, and found that numerical differences were very small. As such, accounting multipliers are deemed sufficient for this study.

The SIO model suffers from several shortcomings. These include its assumptions regarding fixed prices and its presentation of the results as if the economic system adjusted immediately to exogenous changes without addressing the institutional barriers that can prevent such adjustment. In addition, while using three SAMs, the SAM methodology is not optimal for the study of structural change, as the model assumes that the structure is fixed in each year (although changing across the SAMs). As such, this study cannot speak to the relationship of agricultural growth to structural change but is limited to exploring the power of agriculture (and manufacturing) to generate growth. In combination with the high level of aggregation of the sectors—specified to make the SAMs comparable across time—this implies that the model specified here cannot plausibly claim to capture the full complexity of the connection between agriculture and the aggregate economy in Ethiopia. As a result, the study is primarily a tool for measuring the broad changes in economic multipliers in Ethiopia over time rather than a tool for detailed policy analysis. Given that the SIO analysis does not include the institutional barriers to linkages, the results are best understood as the upper bounds of economic linkages. The interpretation of the results should therefore focus on comparisons and patterns of change rather than on exact multiplier sizes.

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CHAPTER 7

SIO Multiplier Analysis

Abstract This chapter presents the main results of the Semi-Input-Output (SIO) multiplier analysis. Overall, the results of the empirical analysis show that the agricultural sector was the best growth option in Ethiopia in the studied time period, with high and strengthening growth linkages to other sectors. Due to the apparent rigidity of the manufacturing sector, manufacturing growth would not have had as strong an effect on overall growth. These results are presented in detail, as well as discussed, in this chapter.

Keywords SIO multiplier analysis • Multiplier effect • Agriculture-led growth • Manufacturing-led growth

The main results of the Semi-Input-Output (SIO) multiplier analysis are displayed in Table 7.1. The table contains the results for three scenarios for all three years: (1) agriculture-led growth (a one-unit demand injection into agriculture), (2) manufacturing-led growth (a one-unit demand injection into manufacturing) with an unconstrained agricultural sector, and (3) manufacturing-led growth with a supply-constrained agricultural sector.

Three aggregates are calculated based on the SIO model: total gross output multiplier, total GDP multiplier, and households' total income multiplier. The output multiplier is the sum of the total effects in the activity accounts and shows how much total output would increase following a

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Table 7.1 SIO multiplier analysis

		2002			*2006*			*2010*			
		Agriled	*Manuled*	*Manuled*	*Agriled*	*Manuled*	*Manuled*	*Agriled*	*Manuled*	*Manuled*	
			A elastic	*A inelastic*		*A elastic*	*A inelastic*		*A elastic*	*A inelastic*	
Activities											
Agriculture	aagr	1.65	0.33	0.00	1.79	0.26	0.00	2.13	0.30	0.00	*Output*
Food-processing	afpr	0.10	0.05	0.03	0.11	0.03	0.02	0.09	0.02	0.01	*multipliers*
Manufacturing	aman	0.09	0.20	0.19	0.10	0.22	0.21	0.13	0.57	0.55	
Utility	auti	0.04	0.03	0.02	0.04	0.02	0.01	0.10	0.03	0.01	
Construction	acon	<0.01	<0.01	<0.01	0.02	0.01	0.01	0.13	0.03	0.01	
Trade/transport	atrad	0.49	0.59	0.50	0.59	0.35	0.27	0.39	0.27	0.22	
Public services	apubs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Private services	aprvs	0.26	0.22	0.17	0.23	0.08	0.05	0.09	0.02	0.01	
Commodities											
Agriculture	cagr	1.68	0.30	0.18	1.94	0.26	0.13	2.36	0.33	0.14	*Demand*
Food-processing	cfpr	0.24	0.10	0.06	0.34	0.10	0.06	0.14	0.03	0.02	*multipliers*
Manufacturing	cman	0.66	1.44	1.32	0.52	1.25	1.18	0.35	1.54	1.49	
Utility	cuti	0.03	0.02	0.02	0.04	0.02	0.01	0.24	0.06	0.03	
Construction	ccon	<0.01	<0.01	<0.01	0.02	0.01	0.01	0.20	0.05	0.02	
Trade/transport	ctrad	0.56	0.67	0.57	0.72	0.43	0.33	0.64	0.46	0.37	
Public services	cpubs	0.02	0.01	0.01	0.02	<0.01	<0.01	0.10	0.03	0.01	
Private services	cprvs	0.24	0.20	0.16	0.26	0.09	0.05	0.13	0.03	0.01	
Margins											
Margins	mar	0.44	0.61	0.53	0.37	0.29	0.24	0.29	0.34	0.30	
Factors											
Labor	lab	0.98	0.35	0.18	1.35	0.26	0.09	1.41	0.30	0.11	*GDP multipliers*
Capital	cap	1.01	0.50	0.32	0.87	0.31	0.20	1.05	0.33	0.18	

Households										
Rural HHs	hrur	0.71	0.29	0.17	1.67	0.43	0.21	1.95	0.50	0.23	*Income multipliers*
Urban HHs	hurb	1.27	0.55	0.33	0.46	0.11	0.05	0.49	0.12	0.05	
Institutions										
Government	gov	0.20	0.21	0.17	0.13	0.17	0.15	0.14	0.24	0.22	
Savings-Invest.	s-i	0.35	0.15	0.09	0.25	0.06	0.03	0.16	0.04	0.02	
Rest of world	row	0.42	0.63	0.56	0.51	0.73	0.66	0.58	0.69	0.61	
Total output multipliers		**2.64**	**1.42**	**0.95**	**2.87**	**0.97**	**0.59**	**3.06**	**1.25**	**0.82**	
Total GDP multipliers		**1.99**	**0.85**	**0.50**	**2.22**	**0.58**	**0.29**	**2.46**	**0.63**	**0.29**	
Total income multipliers		**1.98**	**0.85**	**0.49**	**2.12**	**0.54**	**0.26**	**2.44**	**0.63**	**0.28**	

Source: Author's calculation

one-unit increase in demand for agriculture or manufacturing. Taking Column 1 as an example, the table shows that if one million birr had been injected into the agricultural sector in 2002 (Column 1), the result would have been an increase of 1.65 million birr in agriculture itself, 0.10 million birr in food-processing, 0.49 million birr in the trade and transport sector, 0.26 million birr in the private services sector, and smaller increases in the remaining sectors. Together, an increase of one million birr in exogenous demand for agriculture would have increased the gross output of the entire economy by 2.64 million birr. The one-unit demand increase is seen in the corresponding commodity demand cell for agriculture or manufacturing in row 11/13. Similar to the output multiplier, the GDP multiplier is the sum of the total effects in the factor payment accounts. The multiplier shows how much the income of production factors (labor and capital) would increase per one-unit demand increase and expresses the increase in the total value added. The households' income multiplier is the sum of total effects in the household accounts, showing the total effect on urban and rural households' income of a one-unit increase in demand. The GDP and income multipliers are smaller than the output multipliers due to different leakages in the circular flow of income (e.g., import and tax leakages), which is standard in most economic structures (Breisinger et al., 2009).

The results of the SIO multiplier analysis show that an exogenous injection of one million birr into agriculture in 2002 would have, given the linkage structure in Ethiopia that year, led to a total GDP increase of 1.99 million birr and an increase in total output of 2.64 million birr (Column 1). It would also have generated additional household incomes of 1.98 million (1.27 in urban areas and 0.71 in rural areas) after taking the various transfers, spillovers, and feedback effects in the economic system into account. The same injection of exogenous demand into the manufacturing sector in 2002 (Column 2) would only have led to an increase of 0.85 million birr in Ethiopia's GDP, 1.42 million in increased output, and 0.85 million in household income (0.29 million in rural areas and 0.55 million in urban areas).

The higher multiplier effect of agriculture compared to manufacturing continues throughout the period of study. In both 2006 and 2010, the higher multiplier for agricultural demand compared to manufacturing demand remains. One million birr of increased exogenous demand for agricultural products would have led to an increase in GDP of

2.22 million birr in 2006 and 2.46 in 2010 (Columns 4 and 7). In contrast, increased manufacturing demand would have led to GDP increases of 0.58 million birr in 2006 and 0.63 million birr in 2010 (Columns 5 and 8). The output and income multipliers also remained smaller for manufacturing. If agriculture were a supply-constrained sector (so that increased demand is satisfied with exports), a manufacturing-led investment strategy would have even more limited linkages in Ethiopia during this time period. The total GDP multipliers in this scenario are 0.50 in 2002, 0.29 in 2006, and 0.29 in 2010 (Columns 3, 6, and 9).

These larger economic linkages for the agricultural sector compared to those of the manufacturing sector are linked to the structure of the Ethiopian economy. An analysis of the underlying Social Accounting Matrices (SAMs) reveals that three aspects are important features of this structure. First, agricultural products make up a large share of households' spending in Ethiopia, which is consistent with the structure of many low-income countries. In Ethiopia, agricultural and food-processing products are the largest share of household consumption for both urban and rural households. On average, in the 2002–2010 period, this accounted for 60% of rural households' spending and 45% of urban households' spending (Table 7.2). Second, the SAMs reveal that agriculture is the most labor-reliant sector in the Ethiopian economy (Table 7.3); such sectors tend to be more linked to the domestic economy than capital. Third, a larger share of the increased demand translates into output increases in the agricultural sector than in the manufacturing sector (comparing the demand and output multipliers in Table 7.1). This implies that a larger share of increased investments into manufacturing would be leaked to imports rather than stimulating the domestic economy compared to increased investment in agriculture. Together, these structural features and the rural and agriculture-dominant character of the Ethiopian economy contribute to the larger multipliers for agriculture compared to manufacturing.

Looking at the change over time, the multiplier analysis shows that in each of the three snapshots in 2002, 2006, and 2010, growth in the agricultural sector had a stronger effect on overall growth than growth in the manufacturing sector would have had. Rather than decreasing—as expected if the dynamism of the Ethiopian growth came from a sector outside agriculture—the agricultural multipliers increased. Over the same time period, the multipliers for manufacturing decreased. These results imply that in each of the three years, the agricultural sector was a better

Table 7.2 Average share of household consumption spending by sector, 2002–2010 (%)

	Agriculture	*Food-processing*	*Manufacturing*	*Utilities*	*Construction*	*Trade & transport*	*Public services*	*Private services*
Rural HHs	49%	12%	18%	3%	1%	8%	2%	7%
Urban HHs	33%	13%	26%	5%	1%	11%	3%	9%

Source: Author's calculation based on SAMs obtained from EDRI (2008, 2009) and Aragie (2014)

Table 7.3 Average contribution of capital and labor to total value added by sector, 2002–2010 (%)

	Agriculture	*Food-processing*	*Manufacturing*	*Utilities*	*Construction*	*Trade & transport*	*Public services*	*Private services*
Rural HHs	49%	12%	18%	3%	1%	8%	2%	7%
Urban HHs	33%	13%	26%	5%	1%	11%	3%	9%

Source: Author's calculation based on SAMs obtained from EDRI (2008, 2009) and Aragie (2014)

engine of overall growth than the manufacturing sector would have been. They also imply that during this period, the strength of the agricultural sector as a growth engine was not outpaced by the manufacturing sector.

While the results of the SIO multiplier analysis highlight the importance of the agricultural sector as a growth engine, they also shed light on a possible challenge for Ethiopia's continued economic growth. For growth linkages to stimulate growth—whether stemming from the agricultural sector or otherwise—it is crucial that the sectors that these linkages stimulate can grow; otherwise, the linkages will not result in aggregate growth. The decreasing growth linkages for the manufacturing sector during this period might therefore be a cause of concern. If the economic growth were leading to a successful structural transformation toward higher-productivity sectors (such as manufacturing), one would expect the growth linkages of the manufacturing sector to have grown during this period.

Discussion of Results

The results of the SIO multiplier model show that the agricultural sector was the best growth option in 2002, 2006, and 2010, with high and strengthening growth linkages to other sectors. Due to the apparent rigidity of the manufacturing sector, manufacturing growth would not have had as strong an effect on overall growth.

The study's findings are largely in line with the substantial body of previous work suggesting that agriculture has large multipliers in low-income countries (Pyatt & Round, 1979; Hazell & Roell, 1983; Haggblade et al., 1991; Powell & Round, 2000; Diao et al., 2010b). The findings are also in line with Diao et al.'s (2007, 2010a) findings that agriculture-led growth has been broadly successful in generating growth in Ethiopia given its economic structure. Moreover, the present work provides a more formal SAM-based model for Dorosh and Mellor's (2013) finding that agriculture is a viable means for growth in Ethiopia.

In addition to the inherent limitations of the SIO methodology discussed in Chap. 6, the study's application of the chosen method could have been strengthened by a finer disaggregation of regions, production for market and home consumption, sub-sectors, and by extending the timespan covered. However, such disaggregation was not possible given the available SAMs and the need for a similar SAM structure over time.

Despite these limitations, the empirical investigation is based on rich data for the three years under study, and offers an extension of the previous one-year studies exploring agriculture's growth linkages in Ethiopia. The changes that the Ethiopian agricultural sector underwent during the study period—with substantial growth in agricultural production, productivity, and input use; changing demand patterns; and growing urbanization (Tamru et al., 2017; Bachewe et al., 2018; Dorosh et al., 2018; Vandercasteelen et al., 2018)—lend further support to that the increased agricultural growth linkages that the study identifies are plausible. As such, despite limitations, the applied methodology provides several insights into the functioning of the Ethiopian economy.

The findings show that the agricultural sector has been an important engine of Ethiopia's growth in the short- to medium-term perspective that is studied. However, it cannot speak to whether this also holds for the long term; the time frame is too short, and SIO would not be the optimal method for long-term analysis. The results that the study does provide suggest that while agricultural growth played a large role in Ethiopia's economic growth in 2002–2010, this agriculture-led growth did not spur a structural transformation away from agriculture, as the growth linkages from agriculture increased while those of the manufacturing sector decreased. Based on theory and the historical experience of most now-rich countries, successful long-term growth requires a structural transformation away from low-productivity agriculture to more productive sectors. Historically, this has meant a structural shift toward the manufacturing sector (Chenery & Syrquin, 1975; Rodrik, 2013). However, while some scholars still advocate for the primacy of manufacturing-led growth (Lin, 2012, 2015), it is unclear whether this pattern will hold in the future. The low-income countries of today have seen a much more limited experience in the manufacturing sector than previous developers (Rodrik, 2016; Gollin et al., 2016). Going forward, sectors such as the service sector or high-productive agriculture may be able to take on some of the beneficial characteristics historically associated with manufacturing (Gollin, 2018). If sufficiently permissive conditions are created for the service and agricultural sectors, there is no inherent reason why they cannot be important ladders to economic growth in today's low-income countries. Given the rapid development of the agricultural sector in Ethiopia in the last 20 years (Bachewe et al., 2018; Rohne Till, 2021) and the limited size of the manufacturing sector in terms of employment and output (Table 5.2), growth

linkages (Table 7.1), and low creation of formal employment opportunities (Diao et al., 2021), this ought to be good news for Ethiopia's future growth prospects.

However, even if these aspects indicate that the agricultural sector could continue to be an important engine of growth beyond the short and medium term studied, this prospect does not come without challenges. In addition to the lack of historical precedence—no now-rich country has achieved this status based on agricultural growth in the long term—two aspects are of key concern. First, if agricultural growth continues without growth in other sectors, the falling relative prices of agricultural products may undermine the ability of agricultural growth to lead to overall growth. In order to sustain overall growth, nonagricultural growth is also needed to match the growing supply of agricultural products and increasing demand for nonagricultural products as a result of agricultural growth. Second, the state of Ethiopia's infrastructure might limit the extent to which agricultural growth can continue to generate aggregate growth. Virtually all previous research on agricultural growth linkages emphasizes the importance of rural infrastructure (Haggblade et al., 2007). Despite recent improvements and substantial public spending, Ethiopia still has one of the lowest road densities in the world and has high transport costs relative to international standards (Minten et al., 2014). Lacking infrastructure limits market connections and leads to poorly functioning commodity and factor markets, which limit the potential for agricultural growth to successfully translate into growth in nonagricultural sectors.

These results suggest that while agriculture has been the main sector of growth in the medium term at an early stage of economic development in Ethiopia, it likely cannot be the sole engine of growth for successful long-term economic growth and structural transformation. The realization of agriculture-led aggregate growth will depend on growth both inside and outside of agriculture. This implication is also in line with the previous literature on agriculture-led growth in Ethiopia; for successful growth, agriculture cannot be focused on in isolation of the rest of the economy (Dercon et al., 2009; Diao et al., 2010a). The relatively poor performance of the Ethiopian manufacturing sector so far warrants further investigation. Under a successful process of growth and structural transformation, this sector would also thrive. Its lack of success may itself reflect the challenges identified above, which may have limited the ability of agricultural growth to translate into growth in nonagricultural sectors.

In light of the empirical results and the discussion of these, the main conclusion to emerge from the empirical analysis is that the agricultural sector was the best growth engine in Ethiopia in the studied period. In 2002–2010, the agricultural sector had high growth linkages, which did not diminish during the growth process that took place during these years.

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CHAPTER 8

Concluding Remarks

Abstract This chapter sums up the main conclusions based on the book's three main parts: the theoretical discussion on the role of agriculture in economic growth; the historical account of key aspects of the Ethiopian case study; and the empirical investigation of the relationship between agricultural and aggregate economic growth in Ethiopia during the rapid growth period in 2002–2010. The chapter also outlines some relevant areas of future research, based on the book's research.

Keywords Agricultural growth • Agriculture-centered structural transformation • Role of the state

This book set out to explore whether agricultural-led growth is happening in a country in sub-Saharan Africa (SSA) today, using Ethiopia's recent experience of rapid growth as a case study. Guided by this aim, the main topics of interest discussed in the book are the role of the agricultural sector for economic growth in today's low-income countries, as well as the role that the state can play in agricultural-led economic growth. These topics have been explored in three parts: a theoretical discussion on the role of agricultural growth in economic growth and the role of the state in generating agricultural growth; a historical account of key aspects of the Ethiopian case study; and through an empirical investigation of the relationship between agricultural and aggregate economic growth in Ethiopia during the rapid growth period in 2002–2010.

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The book's empirical investigation (Part III) explored the role that the agricultural sector played in Ethiopia's growth in 2002–2010 by estimating the agricultural growth linkages and contrasting them to those of the manufacturing sector. Two main empirical results emerged: (1) the agricultural sector has high growth linkages in Ethiopia, and (2) these linkages did not diminish during the growth process in 2002–2010. These results indicate that the agricultural sector was the best growth engine in Ethiopia in this period. Moreover, they show that the importance of agriculture for growth was not outpaced by manufacturing, as one would predict if an industrialization process were occurring in the country. These findings imply that the agricultural sector has been important for economic growth in Ethiopia, but that going forward, support both inside and outside agriculture is needed for a successful transformation away from (low-productivity) agriculture. This begs the conclusion that the rapid agricultural growth in 2002–2010 was able to stimulate aggregate growth at the early stage of development that characterized Ethiopia during the period. However, as discussed in Chap. 7, it remains to be seen whether agricultural growth will continue to be the main engine of growth in the long run.

While it is not the job of an economic historian to predict the future, the findings on the prospects for Ethiopian growth are generally positive. The agricultural sector is growing rapidly, extreme poverty is decreasing, and economic growth remains high. However, while the overall tone of the book is optimistic, any celebration of the country's achievements must be tempered by the ample challenges that the country faces. Importantly, Ethiopia's pressing security concerns in light of the ongoing civil war and the lack of political inclusion pose real threats both to continued growth and to the safety and wellbeing of the Ethiopian peoples; efforts to stabilize the situation are crucial. Moreover, the heavy-handed governance that the Ethiopian government has engaged in during the growth period risks excluding some segments of the society, which can cause growth to stagnate and risk civil unrest. Outside the security concerns, many areas also require further improvement: the structural transformation is lagging, poverty is widespread, urbanization levels are some of the lowest in the world, and the manufacturing sector is still in its infancy. Going forward, these challenges will need to be addressed, especially those concerning political and economic inclusion.

A second prediction, or perhaps recommendation, for the future growth path of Ethiopia is that this research does not support an overly rapid abandonment of the agriculture-led development strategy. Using the terminology of Timmer's (1988) four phases of agricultural transformation, it may be favorable to exhaust the benefits of the second phase, "agriculture as a contributor to growth," before moving on to the integration, and reduced role, of the agricultural sector in the economy (phases three and four). Since the Growth and Transformation Plan II in 2015 (MOFED, 2015), the role of the agricultural sector as the center of development has been downplayed in Ethiopian policy in favor of manufacturing. Given the importance of agriculture uncovered in this book and Ethiopia's very early stage of economic development, such a shift may be premature. Instead of focusing on the manufacturing industry and industrial zones—which, even if successful, are only likely to account for a small share of total output and employment (Schmidt et al., 2018)—it may be more effective to focus on achieving structural transformation through high-productivity agriculture. If so, the under-performance of the coffee sector (Mellor, 2014; Cheru et al., 2019) could be the next step to address. By focusing on such an agriculture-centered structural transformation, the country may overcome the challenges posed by its small and slow-growing manufacturing sector, huge rural population, and current discord between the output and employment aspects of the structural transformation.

In terms of future research, much work is still needed to understand the role of agriculture and the state in economic development. Three aspects of this issue seem particularly important. First, the micro-level dynamics of Ethiopia's macro-level agricultural change represent fertile ground for future research and have not been addressed. Further and more detailed consideration of the micro-elements of agricultural and economic change is needed to further grasp the complex nature of how individuals are acting and faring in the agricultural and rural sectors. Research on the local-level dynamics of the observed increase in agricultural production and productivity would add to our previous knowledge on the drivers of micro-level agricultural change and the related processes of smallholder intensification, diversification, and commercialization (Andersson Djurfeldt & Djurfeldt, 2013; Wiggins, 2018). As part of this work, regional studies within Ethiopia's agricultural development would also increase our understanding of the specific dynamics of the ongoing

agricultural transformation. Such regional research could help us understand why some regions of Ethiopia have thrived while others have not, shedding more light on the key aspects of the transformation dynamics. Second, more research on the costs—and not only the benefits—of investing in agriculture versus other sectors is needed. This book's empirical investigation has shown that stimulating agricultural growth has a larger effect on aggregate growth than stimulating manufacturing growth. However, it cannot speak to the cost of stimulating these different types of growth. Hypothetically, the cost of generating agricultural growth could be so high that it offsets the benefit of generating more aggregate growth. Such research might advance our understanding beyond whether it is "good" to invest in agriculture, to whether it is "better" than alternative investments. Third, more research could be done on how other contemporary low-income countries could learn from Ethiopia's experience of an agriculture-led development strategy. However, extracting any such lessons from history is a complex undertaking that should be done with proper care for each individual context (as discussed by, e.g., Harwood, 2018). The book suggests that the Ethiopian experience could be relevant for countries that share some similarities in terms of economic structure, agro-ecological conditions, and political environment. In light of Ethiopia's early stage of economic development, limited access to natural resources, large and rural population, land scarcity, some favorable agro-ecological areas, and the prominent role of agriculture in policy and government commitments, countries that could draw from the Ethiopian experience may include Uganda and Kenya. However, every country has its own conditions and history, and proper analysis would be needed to substantiate such a suggestion.

In addition to these three areas of future research, the aspect of climate change has not been part of the current research, which is a limitation. Climate change has had and will continue to have a large impact on African agriculture, which may be particularly vulnerable to climate change given its rain-fed nature and often low capital intensity (Hassan, 2010). While there is no inherent tension between continued agricultural expansion and environmental sustainability (Wiggins, 2000; Reij & Smaling, 2008), adaptation to climate change will be an important, complex, and potentially costly dimension of continued agricultural development in SSA.

Despite ample room for future research, this research contributes to our current knowledge given its investigation of the role of agriculture in economic growth, its case study of one of SSA's fastest-growing economies, and its rich empirical data examined through both historical and economic methods. The book concludes that the agricultural sector continues to be an important engine of growth in today's low-income countries and that there is scope for governments in such countries to take a leading role in the transformation of the agricultural sector on the path toward long-term economic growth.

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