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Enabling Environment for Agricultural Growth and Competitiveness

EVALUATION, INDICATORS AND INDICES

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Abstract

Enabling Environment for Agricultural Growth and Competitiveness: Evaluation, Indicators and Indices

by

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The key contribution of this report lies in developing a typology to structure the components of the enabling environment for agricultural growth and competitiveness, and in constructing an illustrative Agricultural Growth Enabling Index (AGEI) to summarise a wide array of available information in a coherent manner. The construction of the preliminary AGEI is based on four blocks with 40% of the weight on agriculture/rural factors and 20% each on broader economy-wide governance, capital availability and market operation. The AGEI can be used to provide across-country comparisons or single-country evaluations using the index itself or its components. It allows the decomposition within each main block to show the relative strength and weaknesses of each country across various sub-indices. It has been applied here to a selected set of twenty emerging and developing countries. The preliminary results demonstrate that the AGEI brings together information relevant to the enabling environment for agricultural growth and competitiveness, and which is largely consistent with more in-depth studies of the selected countries. While constrained in some respects, the AGEI appears to be the first index completed with this objective. Further expansion and refinement of the included set of indicators to better reflect key determinants of agriculture's enabling environment would help provide an important input into better policy decisions.

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JEL Classification: O13, Q10, Q18

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Abbreviations

ABI	Agribusiness Indicators
AGEI	Agriculture Growth Enabling Index
DB	Doing Business
DBA	Doing Business in Agriculture
EIU	Economist Intelligence Unit
EOS	Executive Opinion Surveys
ES	Enterprise Surveys
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
GCI	Global Competitiveness Index
GDP	Gross Domestic Product
GFSI	Global Food Security Index
GMA	Government measures and actions
GSSE	General Service Support Estimate
HDI	Human Development Index
ICT	Information and communications technology
IFC	International Finance Corporation
IFPRI	International Food Policy Research Institute
ISI	Import-substitution industrialisation
LAC	Latin America Countries
MCC	Millennium Challenge Corporation
MAFAP	Monitoring African Food and Agricultural Policies
NRA	Nominal Rate of Assistance
OECD	Organisation for Economic Co-operation and Development
PFIA	Policy Framework for Investment in Agriculture
PMR	Product Market Regulation
PSE	Producer Support Estimate
R&D	Research and Development
RRA	Relative Rate of Assistance
SEA	South and East Asia
SSA	Sub-Saharan Africa
TFP	Total Factor Productivity
UNDP	United Nations Development Program
WB	World Bank
WDI	World Development Indicators
WGI	World Governance Indicators

Executive summary

This report addresses three objectives. First, it identifies key determinants of economic growth and development, agricultural growth and competitiveness, and the existing indicators and indices by which these determinants have been measured, through an extensive literature review. Second, it proposes a new typology to structure the components of the enabling environment for agricultural growth and competitiveness and uses this typology to assess the types of indicators that would be desirable for inclusion in an index of the enabling environment across countries. Third, it constructs an illustrative, preliminary Agricultural Growth Enabling Index (AGEI) and applies this index to a selected set of 20 emerging and developing countries. While preliminary in many respects, this is, to the best knowledge of the authors, the first completed exercise of its type.

Throughout the analysis, a positive enabling environment for agriculture is interpreted to comprise the following:

- a multifaceted setting for the sector and economy wide of non-distorting and stable policies
- adequate provision of public goods, good governance through laws and regulations that address market failures
- strong and effective institutions through which government measures and activities are operationalised.

The expected outcome of a positive enabling environment is enhanced agricultural growth and competitiveness driven by well-functioning markets operating in a context of stability and public sector behaviour that is supportive of a forward-looking private economy.

A number of key points emerge to determine such growth and competitiveness. Economic growth and development theory and empirical studies suggest that both supply side and demand side issues need to be considered. Although extensive lists of indicators related to government measures and activities and other factors affecting growth can be identified, and may be used as check-lists of things to consider, the main challenge is to analyse the specific constraints that a country faces and work to address them. These constraints vary by country and evolve with time and changing circumstances. For agricultural growth and development, the crucial role of the rural nonfarm economy emerges as the link between agricultural supply and demand. The policy bias for or against the agricultural sector in terms of relative prices and subsidies, but also infrastructure and public services, and the overall circumstances of domestic demand, need to be taken into account. The state of the global economy will also be an important factor.

There are several challenges to constructing indices of the determinants of growth or competitiveness. These include:

- the choice of appropriate indicators for which to construct such an index
- the availability and the quality of data or the cost of developing more adequate data for those indicators
- the choice of appropriate normalisation, weights, and aggregation methods by which the various indicators are transformed into the comprehensive index.

Within these constraints indicators and indices of the enabling environment are useful to gather quantitative information from different sources, to summarise the situation within a single country, or to allow comparisons across countries. Indices lack the depth of intensive case studies, cluster analysis or formal econometric analysis. Still, they can be utilised to increase public awareness about the current situation regarding different topics and areas and their evolution over time, and to help policy makers to focus on the issues that may require specific attention.

The Global Competitiveness Index (GCI) developed for the World Economic Forum is a well-known index of global competitiveness that, acknowledging its limitations, is drawn upon in this analysis. The Global Food Security Index (GFSI) is a new index of global food security that includes a more substantial set of indicators related specifically to agriculture. There are also a number of related recent studies and on-going initiatives about agricultural growth and competitiveness that suggest alternative indicators that could be utilised.

The typology developed to identify components of the enabling environment for agricultural growth and competitiveness integrates two main dimensions: the various categories of government measures and activities affecting the sector's performance and the effects of these measures and activities across four levels of the economy: agricultural producers; the rural/regional economy, which provide the geographical and local governance settings for food and agricultural production; agricultural value chains, which are the market linkages for specific products between inputs and outputs; and the general economy, where, among other things, final demand is determined.

The potential indicators of the relative performance of countries across these components are described and the limited availability of some relevant indicators on a comparable basis is appraised. Some of the cells of the typology are relatively well covered from available data and studies, particularly for the general economy and the agricultural sector at the farm level. For rural regions and agricultural value chains there are greater deficiencies of available measurements. This poses a limitation on constructing an index of the enabling environment consistent with the postulated typology of the determinants of growth and competitiveness.

The preliminary AGEI is constructed taking note of these considerations. The AGEI is designed to show how an index for agriculture can be constructed to summarise a wide array of available information in a structured manner and then be used to provide across-country comparisons or single-country evaluations using either the index itself or its components. The construction of the preliminary AGEI is presented: it is comprised of four blocks with 40% of the weight on agriculture/rural factors and 20% each on broader economy-wide governance, capital availability and market operation.

The countries to which the AGEI is applied were purposefully selected to include those emerging and developing countries which are the focus of OECD country analyses (including selected OECD members defined as emerging economies) supplemented by a range of other countries to provide reasonable geographic coverage. It should be noted that all countries covered are classified as factor and efficiency driven economies according to the GCI groupings. At this stage, innovation driven economies, most of OECD countries, are not included due to their different structural characteristics. The latter are covered by other OECD projects discussing various components of the agricultural enabling environment, in particular those focused on agricultural innovation systems and on green growth in agriculture.

The preliminary results demonstrate that the AGEI brings together information relevant to the enabling environment for agricultural growth and competitiveness in a parsimonious

manner largely consistent with more in-depth studies of the selected countries. Brazil, Chile and China appear relatively strong across the four blocks, but also noticeable is the variability in relative scores among the main blocks for many countries. Even Brazil, Chile and China show this variation and differ in which components account for their high overall scores (governance and capital for Brazil; governance, markets and agriculture/rural for Chile; and capital for China). South Africa scores relatively lower compared to the other countries on capital and much higher on markets. India scores relatively low on the markets and agriculture/rural components compared to its scores on the other two main blocks.

Among the countries with lowest AGEI scores, Ethiopia, Pakistan, Senegal and Tanzania score relatively poorly on all four blocks. Egypt scores above the average of the countries on the agriculture/rural block. For a number of other countries, there is quite a mixed set of relative scores: for example, Indonesia, Kenya, Russia and Ukraine each score on at least one main block of the AGEI well above and well below the other countries. The reasons for these results are discussed. Similar decompositions are presented for the indicators within each main block of the AGEI and the relative strengths and weaknesses described among the countries for the various sub-indices and within specific countries across the full set of blocks and their components.

The key contribution of this report lies in developing a typology and constructing a preliminary index of the enabling environment for agricultural growth and competitiveness. While constrained in some respects, this initial AEGI appears to be the first index completed with this objective and, overall, provides interesting results. A purpose of this report is to stimulate discussion of the many dimensions of such an index, and of the feasibility and efficacy of how they might be approached in further research and analysis. In short, from this exercise, better indices can eventually be constructed. Expansion and refinement of the included set of indicators will allow further depth of analysis on the determinants of a positive enabling environment to promote agricultural growth and competitiveness, and provide an important input into better policy decisions.

Each aspect of this study is exploratory and designed to contribute to the on-going research on agriculture's enabling environment. On all three objectives of this report, the evaluations presented merit additional consideration. These evaluations include: i) the literature review of existing relevant indicators of the determinants of agricultural growth and competitiveness and of the recent and ongoing studies and initiatives to extend this database; ii) the elaboration of the conceptual typology for evaluating the enabling environment; iii) the matching of indicators to this typology; iv) the specification of an index characterising the enabling environment in each of its dimensions; v) the set of countries to which such an index is applied; and vi) ultimately, verification that the specified index accomplishes its intended purpose by correlating with observed growth.

1. Introduction

In this report a positive enabling environment for agricultural growth is interpreted to comprise a multifaceted setting for the agricultural sector and economy wide of non-distorting and stable policies, adequate provision of public goods, good governance through laws and regulations that are conducive to private-sector economic activity while addressing market failures, and strong and effective institutions through which government measures and actions (herein, GMAs) are operationalised.

The expected outcome of a positive enabling environment is enhanced agricultural growth and competitiveness driven by well-functioning markets operating in a context of stability and public sector behaviour that is supportive of a forward-looking private economy. Competitiveness is understood as the capacity of agriculture to grow and thrive in domestic and world markets without the support of those public policies that are considered market distorting. Although this report focuses on the enabling environment for agricultural growth and competitiveness, the analysis is placed within the context of related agricultural development objectives such as poverty alleviation, food security and nutrition, prosperity of small farmers, social equity, productivity growth and environmental sustainability in agriculture.

This report is organised into five sections. The current Section 1 introduces basic definitions and provides an overview of the content of the report. In Section 2, a three-part review is provided of the literature on growth and development theory and empirical studies (Section 2.1), agricultural growth and development (Section 2.2), and indices of growth and competitiveness determinants, which includes a review of existing indices and the issues that arise in their construction, related recent studies, and ongoing or proposed initiatives to classify, select indicators and construct indices of the enabling factors for economic competitiveness, food security and agricultural growth and competitiveness (Section 2.3).

Building on the literature review, Section 3 develops a typology to identify components of the enabling environment for agricultural growth and competitiveness. This typology link together two main dimensions of agriculture's enabling environment: various categories of GMAs affecting the sector's performance and the effects of these measures across four levels of the economy: agricultural producers; the rural/regional economy, which provide the geographical and local governance settings for food and agricultural production; agricultural value chains, which are the market linkages for specific products between inputs and outputs; and the general economy, where, among other things, final demand is determined. The potential indicators of the relative performance of countries across these components are discussed and a summary is provided of some of the existing indicators that could be used to construct an index of agriculture's enabling environment. The limited availability of some relevant indicators on a comparable basis across countries is discussed.

In Section 4, an illustrative index of agriculture's enabling environment (a preliminary Agricultural Growth Enabling Index, AGEI) is constructed along the lines of the proposed typology and drawing on a selected subset of the available indicators both for the general economy and specific to agriculture. This preliminary index is applied to a sample of 20 emerging and developing countries, their performance on the index and its components are evaluated, and the relationship of the index to observed agricultural growth is examined.

Section 5 provides a summary and conclusions from the report. The contribution of the report lies in pushing through to completion an exercise that, starting with a typology of GMAs built on the literature review (and which could also serve as a checklist for policy analysis), develops a preliminary index of the enabling environment for agricultural growth

and competitiveness. While each aspect of the study is exploratory, the purpose of the report is to stimulate discussion of the many dimensions involved in the typology and the proposed index.

Annex A provides an overview of various initiatives that are trying to identify, classify and measure different GMA issues related to agricultural growth and competitiveness, beyond those initiatives which are discussed in detail in the main body of the report.

2. Literature review

The literature on GMAs addressing the wide range of policies, public investments and other expenditures, laws, regulations, institutions and market performance that support economic growth and agricultural growth and competitiveness is very large. This section starts from a brief overview of literature on the determinants of economy-wide growth and development (Section 2.1) within which agricultural growth and development is discussed in a greater detail (Section 2.2). It is followed by a discussion on the Global Competitiveness Index (GCI) of the World Economic Form and the Global Food Security Index (GFSI) developed recently by the Economist Intelligence Unit (EIU) that can be drawn upon to partly characterise the enabling environment for agriculture in quantitative terms. Other studies and data available for economic enabling environment indicators are also discussed, and some recent initiatives from OECD, FAO, the World Bank and IFPRI are described that are identifying, classifying, quantifying, and ranking different GMAs related specifically to agricultural growth and competitiveness (Section 2.3). Although there are important overlaps in those exercises, they identify a multiplicity of determinants of the enabling environment for agriculture, classify them in different ways, and suggest different indicators and indices.

2.1. Growth and development theory and empirical studies

Growth theory and regressions

Starting with the Solow-Swan model it has been clear that the proximate causes for economic growth are factor accumulation (basically capital, depending on savings and investment, and labour, depending on demographics and human development) and productivity (a combination of available technologies and the efficient use of them) (Weil, 2005). This, however, does not answer what are the fundamental causes that lead to factor accumulation, technological development and efficiency. Adam Smith provided an early answer when he argued that "Little else is requisite to carry a state to the highest degree of opulence from the lowest barbarism but peace, easy taxes, and a tolerable administration of justice: all the rest being brought about by the natural course of things." Other schools of thought envisioned a more active involvement of the state in the economy, a debate that still reverberates in modern analyses of growth and development policies.

Quantitative efforts to test the importance of the more fundamental causes of growth started in the late 1960s and early 1970s (Robinson, 1971; Adelman and Morris, 1967), but the work on growth determinants exploded during the 1980s and 1990s (see Barro and Sala-i-Martin, 1998). The growth equations derived from the Slow-Swan model implied a relationship between the rate of growth, the (natural logarithm) of level of income per capita at the beginning of the period analysed, and the (natural logarithm) of the steady state level of income per capita as captured by a set of variables postulated as growth determinants.

There has been a large literature on the growth regressions, their results, and pitfalls. Sala-i-Martin (2002) summarises the early results as follows: "(i) There is no simple

determinant of growth; (ii) The initial level of income is the most important and robust variable (so conditional convergence is the most robust empirical fact in the data); (iii) The size of the government does not appear to matter much. What is important is the quality of government (governments that produce hyperinflations, distortions in foreign exchange markets, extreme deficits, inefficient bureaucracies, etc. are governments that are detrimental to an economy); (iv) The relation between most measures of human capital and growth is weak. Some measures of health, however, (such as life expectancy) are robustly correlated with growth; (v) Institutions (such as free markets, property rights and the rule of law) are important for growth; and (vi) More open economies tend to grow faster."

These broad conclusions, and the policy recommendations they imply, although generally accepted, have generated some controversies as well. It has been argued that rather than distilling robust results about what constitutes good policies, the strongest conclusion of the literature has been the identification of extremely bad policies that impede growth (Easterly, 2003). Also, while early work on human resources focused on years of schooling (a quantitative variable) and did not find much correlation with economic growth (Sala-i-Martin, 1997), more recent empirical work using better proxies for the quality of education (such as comparable international tests on cognitive achievement) has found stronger links to growth (Hanushek and Wößmann, 2007; Aghion, 2009).

Similarly, the adequacy and interpretation of proxies used in growth regressions for "openness," "outward orientation," and "globalisation," have been questioned. For example, Birdsall and Hamoudi (2002) showed that the positive correlation reported by Dollar and Kraay (2001) between growth and globalising economies is related to the fact that the countries performing worse were commodity dependent, and the collapse in commodity prices in the 1980s and 1990s reduced both growth and the value of the variable interpreted as a proxy for openness, creating a misleading correlation. Among macroeconomic variables, while the negative impact on growth of inflation appeared weak (perhaps because of non-linearities and threshold effects), indicators of overvaluation of the exchange rate were clearly associated with low growth and economic crises (Díaz-Bonilla and Robinson [2010] present a review of the related literature).

While the previous examples show some variations with the early conclusions summarised by Sala-i-Martin (2002), other aspects have been reinforced and expanded. For, instance, the importance of institutions, a theme with a large tradition in classical and development economics, has been reaffirmed by subsequent growth analysis. These institutions include political institutions (democracy, political freedom, regulation of conflict and distribution), legal institutions (property rights, the rule of law), market institutions (market structures, competition policy, international openness), governance institutions (the size of bureaucracy, government corruption), and other institutional aspects (see Adelman and Morris [1967] for an early assessment and Acemoglu and Robinson [2012] for a recent synthesis).

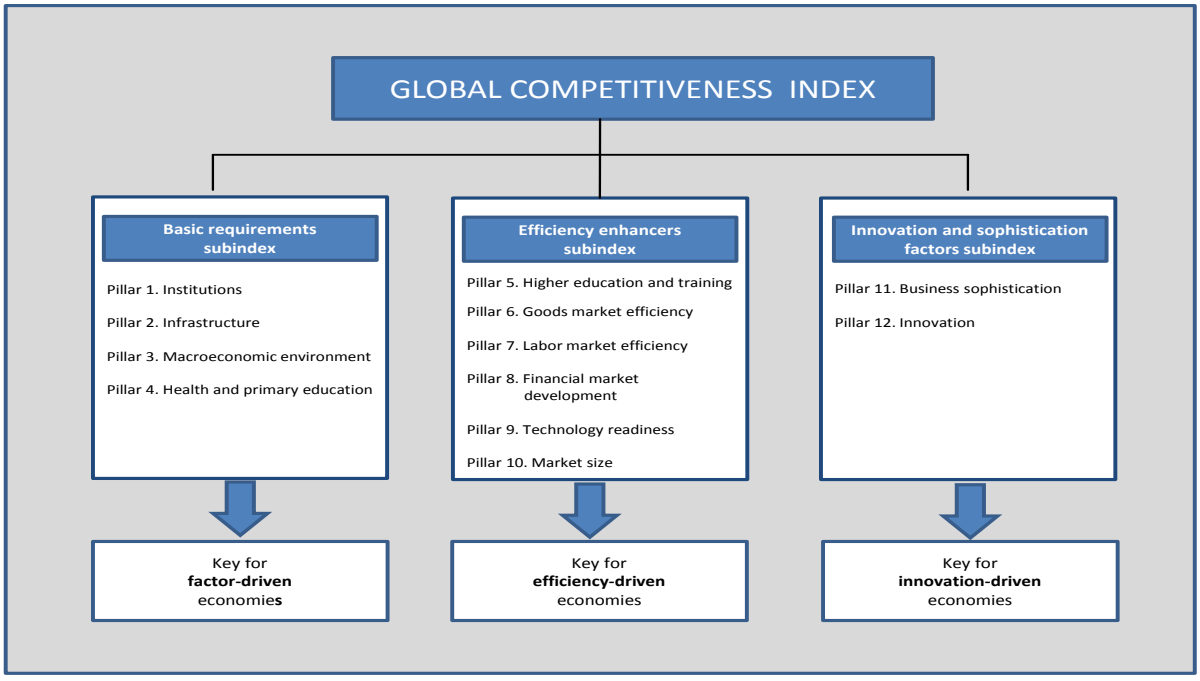
Another topic that has received further attention is technology and innovation. While the Solow-Swan model considered technological change as an exogenous factor, more recent models within the new growth theory have proposed different approaches that look at endogenous innovation, including Schumpeterian models that involve creative destruction (Romer, 1990; Aghion and Howitt, 1998). These models suggest that innovation and productivity are fostered by "(i) better protection of (intellectual) property rights, as this will improve the extent to which successful innovators can appropriate the rents from their innovation; (ii) better financial development, as tight credit constraints will limit individuals' ability to finance a new innovative idea; (iii) a higher stock of educated labour, as this will improve individuals' ability to imitate more advanced technologies or to

innovate at the frontier building on giants' shoulders; and (iv) macroeconomic stability: by ensuring low (risk-adjusted) equilibrium interest rates, it will encourage individuals to engage in long-term growth-enhancing investments" (Aghion and Durlauf, 2009).

Other aspects of structural conditions and GMAs, such as the size of the market and market competition, are also crucial variables. One of the implications of these theories, Aghion and Durlauf (2009) argue, is that the best policies and institutions to foster innovation, growth and productivity may take different forms depending on whether countries are catching up and are still far from the world technological frontier, or whether they need to innovate because they are close or at that frontier. For instance, countries in the latter stage may need more product market competition and entry, stronger college education, equity (as opposed to loan) finance, and more democracy and decentralisation, compared to the countries in the former stage.

The list of real or postulated growth determinants and advances in data collection and processing have led to the creation of indices of different types to try to measure those determinants. For instance, the Global Competitiveness Index (GCI) (Sala-i-Martin et al., 2013) collects data on different variables under 12 pillars. These are grouped in three main blocks, which are applied to countries under three groups (factor-driven, efficiency-driven, and innovation-driven), as characterised in Figure 1.

Figure 1. Indices of factors determining growth



Source: Sala-i-Martin et al., 2013.

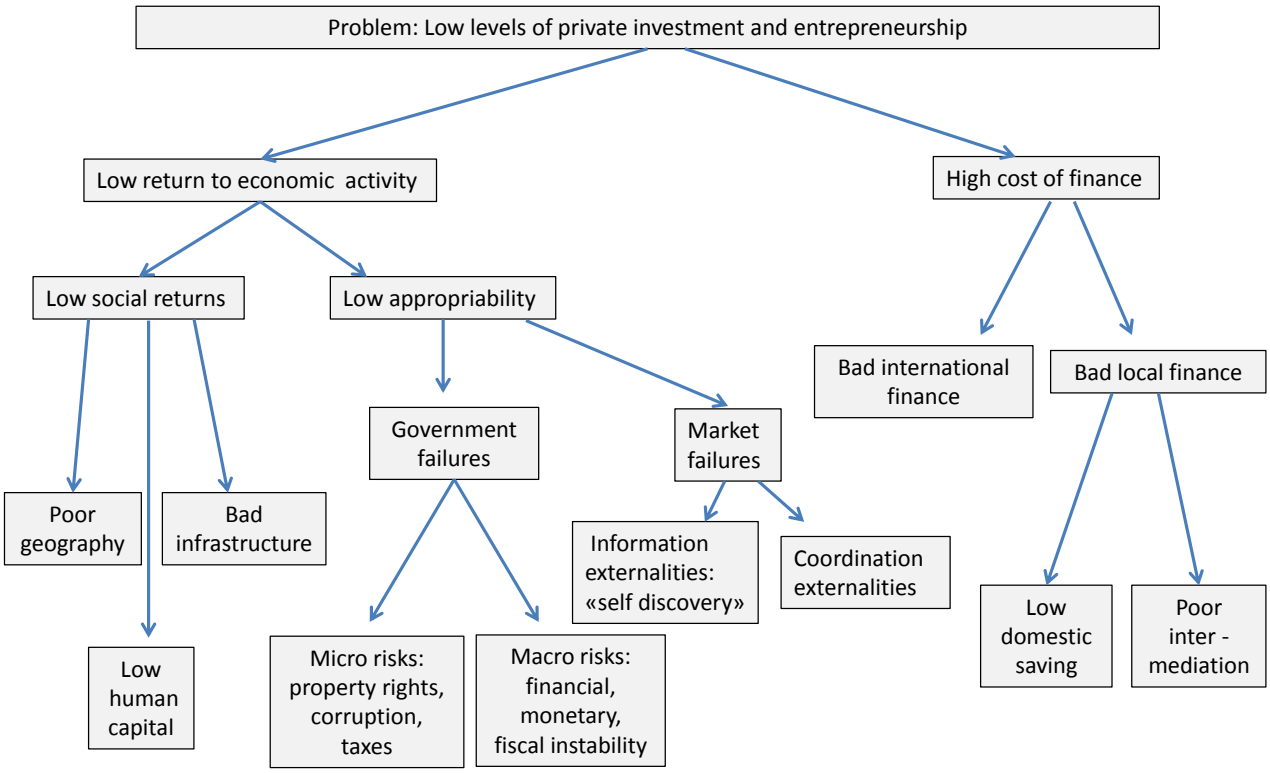
Growth diagnostics

A different line of empirical analysis, also emerging from a variation of the Solow-Swan model, but reacting to what is considered a "laundry-list" approach to growth, has highlighted the need to look at the specific constraints that may be affecting a country's economic performance, in what has been called growth diagnostics (Hausmann, Rodrik, and Velasco, 2005). It is argued that growth regressions, even if they solve all the

econometric specification problems, would provide a list and ranking of policies that work for the "average country;" but then, individual countries are not averages, and they suffer from specific constraints and face unique opportunities.

Growth diagnostics starts from neoclassical growth models where the rate at which the economy grows is a function of the difference between the expected return to asset accumulation and the cost of those assets as perceived by the private economic agents. Higher growth depends on the incentive to accumulate, which is the difference between the proportion of social economic returns that is privately appropriable (less than gross returns if there is a tax on earnings, but also driven by many other things), and the opportunity cost of funds. Growth diagnostics builds a decision tree starting from whether the returns are high or low, whether they can be appropriated, and the cost of financing. By working down the tree it identifies a series to reasons that may be constraining growth, as shown in Figure 2.

Figure 2. Decision tree for growth diagnostics



Source: Hausmann, Rodrik, and Velasco, 2005.

The objective of growth diagnostics is to determine for specific countries what are the main constraints utilising an explicit and structured approach (which is not based on growth regressions), and then to suggest policies and other measures aimed at lifting those constraints. However, Aghion and Durlauf (2009) have argued that growth regressions can be a better way of identifying the growth constraints than the decision tree approach utilised by Hausmann, Rodrik and Velasco, 2005.

Demand side issues

Most of the analysis mentioned so far works from the supply side, assuming that demand is always there to absorb the products generated (a form of Say's Law) and that factors of production are fully employed, even though there are important variations in demand conditions. Robert Solow (2005), one of the originators of the basic Solow-Swan growth model, has acknowledged the omission of demand considerations as a weakness of the growth theory based on this model. Recognising the importance of the demand side for growth and the possibility of unemployed factors, Kaldorian and Keynesian growth models (see for instance, Setterfield, 2010) consider autonomous demand (such as exports), as well as income distribution between wages and profits, as factors that determine aggregate demand and therefore growth. In demand-led endogenous growth models technological change is also linked to demand side issues.

For developing countries, the state of the global economy is an important determinant of the internal growth conditions in those countries, not only because of the impact on the demand side via trade flows, but also through more complex demand and supply interactions related to capital flows, technology diffusion, real interest and exchange rates, and migration. Growth regressions that do not control for the state of the world in these terms may provide inadequate advice on policy interventions and other domestic variables considered to impact growth.

Pro-poor growth

In development analysis growth is often linked to the need to improve the standard of living of significant sectors of the society, particularly the poor. More than forty years ago, Little, Scitovsky, and Scott (1970) and Balassa and Associates (1971) argued, among other things, that the import-substitution industrialisation (ISI) strategy followed then by many developing countries was, due to policy distortions, excessively capital-intensive (which slowed employment growth in industry) and limited the development of agriculture. Both effects had negative implications for poverty alleviation. Chenery et al. (1974) presented the case for a growth and investment programme centred especially on accumulation of human and physical capital by the rural poor.

Separately, a basic-needs approach to poverty also emerged in the late 1970, arguing that objectives such as growth, or even employment and income redistribution, were means to the more concrete objective of attending to the needs of the population (defined primarily by advances in health, education and other indicators of human development, especially for the poor and vulnerable). The basic-needs approach implied an important role for the public sector in the provision of certain public services and improvements in access so as to effectively reach the poor. It also promoted organisation of the population that was to receive the services and their participation in the decisions and actions to be implemented (Streeten and Burki, 1978).

After a period during the 1980s, in which macroeconomic stabilisation and structural reforms were the focus of growth policies, in the 1990s concerns about slow or no progress in poverty reduction in many developing countries led to an emphasis on pro-poor growth, as something different from growth alone calculated using the average of per capita income (World Bank, 1990). The most common notion was that growth was pro-poor if the poor benefitted the same or more than the non-poor population. Although there have been a series of statistical difficulties and differences in how to operationalise this concept, one analytic result is that the impact of growth on the reduction of poverty depends inversely on indicators of income or asset inequality (Ravallion, 2004). While overall economic growth remains a central factor for poverty reduction, the sectoral composition of growth seems to

matter with agricultural growth appearing to be more pro-poor than growth in other sectors in developing countries. This reflects the reality that a large proportion of the poor depend on agriculture, thus accelerated growth in this sector "is likely to disproportionally benefit the poor" (Dollar et al., 2013).

Recent synthesis

The latest large-scale effort to summarise the analysis of successful growth strategies has been the Commission on Growth and Development (2008, 2010), also known as the Spence Commission. The Spence Commission argues that countries with successful growth stories have:

- fully exploited the world economy
- maintained macroeconomic stability
- showed high levels of investment, private and public, with high rates of domestic saving
- respected market signals in general (although not absolutely at times) and allowed structural changes and labour mobility, protecting laid-off workers but not maintaining unviable industries, companies or jobs
- have governments committed, credible, and capable of providing a range of public goods, offering a vision of the future that justified today's efforts, and that tried to ensure that opportunities and benefits were shared widely.

The Commission (2010) classifies policies into five broad categories: accumulation, innovation, stabilisation, allocation, and inclusion. It also warns that every country must tailor policies to their respective conditions, because "a list of ingredients does not make a recipe."

2.2. Agricultural growth and development

Agricultural growth and structural change

The Solow-Swan model and many variations of it analyse a one-sector economy. That is the case of most of the demand-side models as well. To analyse agricultural growth as a component of the aggregate economy, it is necessary to consider more than one sector. There are some examples of both types of growth models that disaggregate the economy into agriculture and non-agriculture. For example, Acemoglu (2009) shows in a neo-classical model with a consumption specification that follows Engel's law that the agricultural sector grows at a lower rate than industry. Thirlwall (1986), in a Kaldorian model, shows that agriculture is an important demand factor for industry.

Therefore, it is necessary to consider more than one sector to be able to analyse not only growth but also development. The latter involves, among other things, the notion of structural changes, both in the composition of employment and production. An important part of the process of development is the shift of employment and production from agriculture to manufacturing, and then from manufacturing to services (Acemoglu, 2009). While accelerations in agricultural growth appear at the beginning of most successful cases of development (starting with the Industrial Revolution in the 19th century), later an important part of the process of development is the shift of employment out of agriculture.

More specifically, Barrett, Carter, and Timmer (2010) (following Timmer, 1988), in their review of one hundred years of agricultural development literature, note that

agriculture evolves through four stages when long historical periods are considered. They label these four stages as "the "Mosher" stage when getting agriculture moving is the main policy objective (Mosher, 1966); the "Johnston-Mellor" stage when agriculture contributes to economic growth in the rest of the economy through a variety of linkages, such as supplying labour and raw materials to industry, providing food for industrial workers, expanding markets for industrial production, and by the generation of foreign exchange through exports (Johnston and Mellor, 1961); the "Schultz" stage when rising agricultural incomes fall behind those in a rapidly growing nonfarm economy, inducing political tensions (Schultz, 1978); and the "Johnson" stage where labour and financial markets fully integrate the agricultural economy into the rest of the economy (Johnson, 1997). Individual countries may follow different paths, but a constant of the process of structural change is that agriculture's share in employment and production declines, in good measure linked to the declining percentage of food demand as incomes increase.

In his context, policies to enhance an enabling environment for agricultural growth must ensure, at various stages of development, that structural change takes place without distorting incentives that may accelerate the movement of labour out of agriculture (such as the case of turning incentives against agriculture) or slowing it down (by shifting incentives in favour of the sector).

Price policy biases against or supportive of agriculture

Some of the ideas of linkages from agriculture to the rest of the economy were embedded in the notion of the agricultural sector as a basis for support of the strategy of inward oriented ISI that was attempted by a variety of developing countries after the end of World War II. The particular setting of incentives of the ISI led to various criticisms, including to what was considered its anti-agricultural policy bias. Several studies (Little, Scitovsky and Scott, 1970; Balassa and Associates, 1971; Krueger, 1978) pointed to the supply-side constraints generated under the ISI policies by the resulting macro structure reflected in two relative prices (the tradables/nontradables price (essentially, the real exchange rate) and the relative price of industrial products to agricultural products, reflecting tariffs and other market interventions). According to these studies the policies adopted had a triply damaging effect: i) they made the economy operate within the production possibility frontier; ii) they led to a composition of total production that did not allow the country to benefit from international trade; and iii) they slowed the outward growth of the productive possibility frontier (or productive potential) of the country.

This overall critique was followed by sector-specific studies (mostly covering the period from the 1960s to the mid-1980s) that analysed the direct and indirect effects of trade, exchange rate, and other macroeconomic policies on price incentives for agriculture (Krueger, Schiff, and Valdés, 1988). The analysis focused on the production incentives provided to agricultural products by the policies implemented. This analysis found that agricultural importable goods were generally protected while exportable ones were taxed. However, once the indirect effects of overvalued exchange rates and industrial protection were considered, there was a negative price bias against agriculture that affected incentives and the performance of the sector. The policy recommendation was to eliminate inefficient industrial protection, to avoid the overvaluation of the exchange rate, and to phase out export taxes on agriculture. At the same time, it was considered that sectoral interventions that supported and subsidised agriculture should also be substantially revamped and scaled down, given that overall incentives would shift in favour of agriculture with the change in the general macroeconomic and trade framework (World Bank, 1986).

The elimination of a general price and macroeconomic bias against agriculture became one of the goals of policy reform strategies, including structural adjustment programmes, supported by the World Bank and others international institutions, and many countries undertook such reforms in the 1990s. This price bias, however, was different from a more general urban bias discussed by Lipton (1977), which also included the allocation of public investment and expenditures, and other policies. He argued that the poor remain poor in developing countries because public expenditures and economic policy in general (not only relative prices), benefitted urban groups who were better positioned to pressure governments to defend their interests, while rural population were short-changed.

The partial-equilibrium calculations on policy bias against agriculture by Krueger, Schiff, and Valdés (1988) and others have been criticised for, among other things, the use of nominal instead of effective rates of protection and the ad-hoc estimation of the exchange rate misalignments. Jensen, Robinson, and Tarp (2002), for example, using general equilibrium models for the same countries, concluded that the partial-equilibrium measures used in earlier studies tended to overstate the price bias against agriculture. Alternatively, it could be argued that whatever the previous bias had been, it had been reduced or eliminated during the 1990s, through the changes in exchange rate, fiscal, monetary, and trade policies resulting from the structural adjustment programmes implemented by many developing countries.

Furthermore, looking at levels of import tariffs since 2000, and contrary to the conventional assessment in the late 1980s, agriculture (considering both primary and processed products) seems, on average, more protected than industry in developing countries (Díaz-Bonilla and Robinson, 2010). Recent estimates of the nominal rate of assistance (NRA) for agriculture (Anderson and Valenzuela, 2008) show that such assistance has been growing in developing countries, turning positive since the mid-1990s. The increased NRAs in those countries have been both the result of more protection for importables (i.e., a growing NRA > 0) and less taxation for exportables. Likewise, the relative NRAs for agricultural and non-agricultural goods (what Anderson and Valenzuela (2008) call the relative rate of assistance, or RRA), which in their calculations showed a significant bias against agriculture during the 1960s through the early 1980s, has been moving since then in favour of the agricultural sector, turning positive in the late 1990s and early 2000s. Therefore, not only does whatever policy bias existed before seem to have been eliminated, but those indicators suggest there is often now positive relative support for the agricultural sector in many developing countries.

In either case, measurement of the enabling environment for agriculture needs to consider relative price incentives for the sector using adequate indicators. It should also be recognised that analysing only relative-price biases may leave out important determinants and aspects of the performance of the agricultural sector in emerging and developing countries.

Demand conditions and linkages

Several studies have focused on agricultural growth multipliers for the rest of the economy, i.e. how much overall GDP was generated by expanding agricultural GDP (see for example, Haggblade and Hazell, 1989). These analyses usually found positive and large multipliers, showing the importance of agricultural development for the economic dynamism of the rest of the economy. However, considering that the focus of this report is the evaluation of the enabling environment for agricultural growth and competitiveness, the discussion that follows, while acknowledging the importance of agricultural growth and development for the whole economy, focuses on the reverse linkages from the rest of the

economy to agriculture, which are most germane for the discussion of what enables growth and competitiveness in the agricultural sector.

In a recent OECD review of agricultural policies for poverty reduction, it is stressed that "many of the policies required to improve farmers' opportunities are non-agricultural." They include improvements in education, primary healthcare and in overall investment climate, which "depends on factors such as peace and political stability, sound macroeconomic management, developed institutions, property rights and governance" (OECD, 2012). In the FAO review based on consultations on the enabling environment for agribusiness and agro-industry development, Konig et al. (2013) argue that "policies and strategies that aim to increase agro-based investments must not only emphasise business climates, but also consider the elements that affect investment profitability and, in consequence, investors' perceptions of risk-to-return ratios." This recognises that the notion of business climate perceived as operating only on the supply side may be missing crucial aspects of a general enabling environment. In particular, as in growth models, demand conditions need to be considered. For example, Orden, Paarlberg and Roe (1999) and Gardner (2002) include among the underlying causes of US agricultural growth in the 20th century, the economic growth in the non-farm economy, which provides the demand for agricultural products. Also, Barrett, Carter, and Timmer (2010), after discussing the impact of agriculture on the growth performance of the rest of the economy, refer to the reverse link when they note that "unless the non-agricultural economy grows, there is little long-run hope for agriculture."

In terms of an enabling environment for agriculture, even if overall growth occurs, a problem is that the two-way linkages between agriculture and the rest of the economy may not occur automatically without adequate governmental policies, investments and institutions. For example, in several African countries the urban demand side is not well linked to the potential supply side that exists in the domestic economy. Barrett, Carter, and Timmer (2010), when discussing those linkages, note that "the rural nonfarm sector provides the bridge between commodity-based agriculture and livelihoods earned in the modern industrial and service sectors in urban centres… The firms and activities in the rural nonfarm sector mediate many of the two-way linkages between agriculture and the macroeconomy that are at the core of the development process."

Therefore, two important enablers of growth in the agricultural sector are: i) sustained growth on the demand side (i.e. growth in the non-agriculture economy and exports) and ii) the strengthening of the rural nonfarm sector and the value chains that link agricultural supply with demand (see for instance, Haggblade, Hazell, and Reardon, 2007). Economic policies that ensure trade opportunities as part of the demand for agricultural products would include, for instance, properly managed exchange rates, which avoids overvaluation and excessive volatility. At the same time, as the larger percentage of agricultural production in many developing countries is consumed locally, that domestic demand depends on the overall functioning of the economy. In consequence, general macroeconomic and other policies that maintain sustainable growth of aggregate demand in line with potential aggregate supply, that ensures inclusive and broad-based growth, and that avoids economic crisis, would be part of the overall enabling environment for agricultural growth.

It should also be noted that the composition of external and domestic demand may vary by product, and generate different growth paths. For instance, Diao, Dorosh and Rahman (2007) analyse the demand-side conditions for agricultural growth in East and Southern Africa and find that an export-led agricultural growth strategy may not generate substantial overall income growth, while increasing productivity and production of staple foods

supports higher growth in agriculture provided that there is rapid growth in the nonfarm economy (which creates demand) and that marketing costs are reduced (which allows African producers to supply that demand).

Public spending and agricultural growth

In terms of agricultural growth determinants, a literature over the past decade (building on earlier contributions) has focused on the impacts of public investments and other expenditures at relatively broad levels on the growth of agricultural output among developing countries. Benin, Fan and Johnson (2012) summarise the approach. Agricultural growth depends on advances in total factor productivity (TFP), which is heavily affected by public expenditures on agricultural research and development (R&D), and the level of utilisation of input factors, which reflects private-sector investment and allocation decisions given input and output market signals. These two growth determinants, in turn, are affected by direct, indirect and interaction effects (including the crowding-out or crowding-in effects of the public expenditures on private spending) from various forms of public expenditures on agriculture and the non-agricultural economy, and by the effects of non-expenditure factors affecting TFP and markets.

In the public spending assessment studies (see, for instance, Mogues and Benin, 2012; Mogues et al., 2012; Fan, 2008), there are econometric estimates of the effects of different forms of public agricultural spending (e.g. research, irrigation, conservation) on agricultural factor use (e.g. use of labour, capital and intermediate inputs) and agricultural output and productivity (e.g. output per capita, per worker, per hectare, TFP). Likewise, econometric estimates are drawn upon to measure the effects of non-agricultural public spending (education, health, roads, electrification, rural development, telecommunications) on these growth-related variables. With these estimates, simulation analysis can be carried out to assess the impacts of alternative choices and time-paths of public outlays.

Some of the results of this literature are as follows, as summarised from the extensive review of existing studies by Mogues et al. (2012):

- First, aggregate public spending on agriculture seems to have moderate or even modest returns on rural welfare, agricultural growth, economic growth, or poverty reduction. This is the result of considering together public expenditures that seem to have important positive impacts with others that do not have positive impacts or even lead to negative outcomes. The implication is that it is important to analyse different types of public expenditures in and for agriculture.
- Second, a consistent result across a large number of studies is that returns to agricultural R&D expenditures are positive and substantial for agricultural productivity and growth. Four-fifth of the 120 reported internal rates of return to expenditures on agricultural research are greater than 20%, and two-fifth are between 20 and 60% (Evenson, 2001), although returns vary by regions and products (Alston, 2010). Estimates for China, for example, show that one monetary unit spent on R&D yields more than 6.5 monetary units of agricultural GDP, and in the case of India during the 1990s the result is between 9-10 monetary units of agricultural GDP. Given those results, it appears that there is a substantial underspending on agricultural R&D.[1]

1. Goñi and Maloney (2014), while recognising the importance of R&D for technological catch up, argue that the rates of return to R&D follow an inverted U: they rise with distance to the technological frontier and then fall thereafter, potentially even turning negative for the poorest countries. This might be due to the weakness of such factors as education, the quality of scientific

- Third, in several countries where comparisons have been attempted, public spending on agricultural R&D outperforms other public expenditures in agriculture, such as extension, irrigation, and fertiliser subsidies, in terms of raising agricultural productivity. It also seems to outperform other spending on agriculture, such as rural road infrastructure, education, electrification, health, and telecommunications, although several of the latter spending also have positive impacts on agricultural growth and productivity. Agricultural extension expenditures show relatively high returns and irrigation appears a positive investment in some countries, but not in others. The estimates cited by Mogues et al. (2012) for China indicate that one monetary unit spent on general education yields more than 2 monetary units of agricultural GDP; for roads and telephones, between 1.5 and 1.7; and for irrigation and electricity, less than 1.5. Fertiliser subsidies, at least as measured in India, rank last out of eight different types of agricultural and non-agricultural spending in terms of their contribution to agricultural productivity. For India the cited studies indicate expenditures of one monetary unit in roads result in 7-8 units of agricultural GDP, education between 5-6 units, irrigation, 4-5 units, and credit subsidies about 4 units, whereas a monetary unit expenditure on fertiliser and power subsidies led to just 1 unit or less of agricultural GDP.
- Fourth, public expenditures on agricultural R&D appear to also rank high among the most effective interventions to reduce poverty (although not always as the first option, as the case for raising agricultural productivity). Estimates summarised in Mogues et al. (2012) calculate than 1 million monetary units in China led to 1 200 fewer poor people when invested in education, while R&D was a close second, leading to a 1 000-reduction in the poverty headcount. The same calculations for India, based on one million monetary units, were 120 fewer poor people due to spending in roads, and 80 fewer due to R&D (the second largest impact); in Thailand, it was more than 250 fewer poor people for electricity and between 100-150 for R&D (also the second largest impact); and finally, in Uganda, this monetary level of R&D expenditure led to a reduction of almost 60 in the poverty headcount (the largest impact) and feeder roads ranked second with a reduction of about 30-40 person in the poverty headcount. It should be noted that 1 million monetary units may have different purchasing power in the countries mentioned, therefore comparisons of the impact of expenditures on the amount of poverty reduction across countries, as opposed to between alternative expenditures within countries, are not valid. Overall, the results suggest that there is no (or minimal) trade-off between growth and poverty alleviation policies in regards to spending on agricultural R&D.
- Fifth, certain agricultural expenditure (such as biofortification) have positive impacts on health and nutritional outcomes, and are identified as highly cost-effective (Meenakshi et al., 2010).
- Sixth, returns to public expenditure on and for agriculture have been declining over time, with the exception of agricultural R&D. For instance, in the studies cited by Mogues et al. (2012), the use of fertiliser subsidies in India had a larger impact in previous decades than more recently: in the 1960s-1970s 1 monetary unit spent on irrigation subsidies led to about 4-6 monetary units of agricultural GDP (lower than R&D which yielded between 8-10 units), but in the 1980s and 1990s the impact declined to between 2-3 monetary units of agricultural GDP (while the impact of

infrastructure, the overall functioning of the national innovation system, the quality of the private sector, all necessary to complement R&D, but becoming "increasingly weak with distance from the frontier and the absence of which can offset the catch up effect".

expenditures on R&D stayed at 8 or more). These results suggest that there may be a start-up effect, but that this impact declines over time. The consideration of the time dimension is important because the short and long term effects of public expenditures seem to be different.

- Seventh, besides the type of public expenditure it may be important to consider the geographical dimension of the expenditures. Mogues et al. (2012) offer the tentative conclusion that there may be greater returns per dollar of expenditure in less-favoured areas than those in high-potential areas, both in terms of poverty reduction and, more controversially, for agricultural performance. They caution that further empirical analysis is needed on these questions. In any case, the effects of government expenditures on agricultural development are usually heterogeneous depending on geographic areas, which highlights the importance of the co-ordination between central and sub-national governments to define what expenditures are needed, where are they needed, and whether the level and composition of public resources applied in a region are adequate for the goals defined.
- Eighth, the evidence is mixed on whether aggregate public expenditures on agriculture "crowd-in" private investments (Mogues et al., 2012). In any case (as shown in the country data compiled by Lowder, Carisma and Skoet, 2012) private investments are far larger than public ones, crowded-in or not.
- Ninth, the findings from different studies should be interpreted as results at the margin (i.e. the impact of an additional unit of expenditures). Therefore, they cannot be utilised to justify or assess actual or proposed large changes in the structure of expenditures, such as significantly reducing funding of an activity, or allocating substantial new resources to another, which would dramatically change the impacts of those resources. Also, Mogues et al. (2012) caution about the extrapolation to other circumstances of the conclusions that emerge from certain regions or time periods in the studies they reviewed. The context and application of the conclusions of those results need to be carefully considered.
- Tenth, public expenditures have opportunity costs, not only in terms of alternative uses of those funds, but related to how those expenditures are financed, such as taxes, borrowing, and money creation. Therefore, it is important to be able to justify public expenditures focused on agriculture. Usually the reasons for public interventions are related to the presence of some sort of market failure or to distributional concerns.
- Eleventh, as illustrated in the preceding points, the studies reviewed in Mogues et al. (2012) show that agricultural expenditures can help with outcomes in other areas (such as health), while expenditures not directly aimed at agriculture, including energy, rural roads, education, and so on, have strong impacts on agricultural growth and productivity. Therefore, there is a need to co-ordinate across ministries and agencies, share information about the amount and characteristics of the public expenditures and their cross-sectoral effects, and improve the allocation of resources to achieve multiple development goals. The co-ordination imperative and the geographical dimension also call for a better understanding of the differential impacts of public expenditures at the national, provincial, and local level, including the impact of decentralisation in public sector expenditures and interventions in and for agriculture.

Pro-poor growth, and food security

Theodore Schultz (1979) famously argued that by understanding the economics of agriculture one could know much of the economics of being poor, which in turn was much

of the economics that really matters. Since then, several empirical studies have evaluated the impact of agricultural growth on poverty reduction, on income growth in different quintiles, and on similar indicators. An objective of those studies was to determine whether agricultural growth was pro-poor (Eastwood and Lipton, 2000; OECD 2006). The results in general supported the notion that agricultural growth not only is pro-poor in reducing poverty or increasing more the income of the lower quintiles of the income distribution, but also appears to have larger impacts on poverty reduction than growth in other sectors. The channels through which agricultural growth helps reduce poverty, which are also relevant for food security, are i) an increase in farms income, ii) more employment opportunities in rural areas, iii) declines in food prices for net buyers, and iv) general multiplier effects on the rest of the economy from agricultural growth and demand.

The exceptions to these results appeared in developing countries with large inequalities in land holdings where agricultural growth appeared uncorrelated with poverty reduction (Eastwood and Lipton, 2000). Also, the correlation weakens with increases in a country's income (i.e. in richer countries, agricultural growth does not have stronger impacts on poverty reduction when compared with other sectors).

The issue of ensuring that agricultural growth remains pro-poor is related to the dilemma in developing countries between pursuing growth and production, usually concentrating support on larger, modern agricultural units, or emphasising poverty reduction and food security with a focus on small farmers, landless rural workers, and other vulnerable groups. This dilemma has many facets, including the possibility of complex two-way influences, such as whether more equal societies have higher and more stable rates of growth than their more unequal counterparts (Alessina and Perotti 1996; Deininger and Squire, 1997). Others have noted the positive impacts of an agrarian structure based on family farms on the emergence of democratic governance (Moore, 1967) and on the formation of larger domestic markets that allow the development of industry and other activities. The environmental sustainability of a strategy based on large commercial farms, versus a strategy focused on small-scale agriculture, has also been amply debated.

Agricultural growth, and in particular pro-poor agricultural growth, is also important for food security for a number of reasons (see, for instance, Díaz-Bonilla et al., 2003; OECD, 2013a). The common definition of food security, such as the one adopted at the World Food Summit in 1996, includes four main components: availability (which depends on domestic supply and trade of food); access (which is influenced by income, employment, and poverty patterns related to economic growth and development); utilisation (which depends on the nutritious quality of food, but also on other factors such as health services, water and sanitation infrastructure, education, women empowerment, and good governance); and stability (i.e. that people should have physical and economic access to adequate food at all times).

Agricultural growth and, in particular, increased food production contribute to all four aspects of food security. Food production directly ensures availability (first component). While overall economic growth is a key factor contributing to the remaining three aspects of food security, the role of agricultural and food production growth is also important. For example, it generates broad employment and income opportunities that are crucial for food access (second component). Agricultural growth, with its multiplier effects in the rest of the economy, also contributes to government revenues, which may be used to improve basic health services, water and sanitation systems and safety nets for the poor and vulnerable. These expenditures and investments, in turn, help both access and the proper utilisation of food (second and third components). Support for public goods that enable food production combined with an active role of trade policies help ensure stability of food consumption

(fourth component). Thus, across all four dimensions, a positive enabling environment for agricultural growth and competitiveness contributes to food security.

While agriculture and food production contribute to the four components of food security, the latter is a multifaceted concept that is affected by a variety of factors. For instance, Smith and Haddad (2000) in a cross-country analysis with data from 63 developing countries over the period 1970-96, and using anthropometric measures of food insecurity (linked to child malnutrition), found that in the regions with the highest rates of food insecurity (Sub-Saharan Africa and South Asia), besides improvements in per capita food availability, women's education also contributed to strong declines in food insecurity. In East Asia, the need to improve women's education (and the status of women relative to men) ranked above food availability as a contributor to food security. In other regions, such as Latin America, North Africa and the Middles East, increases in food availability were not as relevant, while issues such as women's education and status, and the provision of health services appear more important to reduce food insecurity.

In summary, the enabling environment for agricultural growth and competitiveness appears crucial for poverty alleviation and food security in most developing countries. Additional considerations about agrarian structures, the role of small farmers and rural labourers, and women empowerment should also be taken into account when designing government interventions.

World economic conditions

The prevailing international economic conditions affect economy-wide growth in individual countries, as discussed briefly in Section 2.1, and in the agricultural sector, in particular. Domestic policies may have different effects depending on whether the world economy is growing or not; on whether world interest rates and world agricultural prices are high or low; on the evolution of the exchange rates of major global currencies; on the level, composition and direction of international capital flows; and on other similar indicators of the world business cycle.

The world economy has gone through different growth cycles during the last decades, with two periods of relatively high agricultural prices (as well as other commodities): in the 1970s, and since the late-2000s. In between, the global economic recession of the early 1980s, a result of tight monetary policies in industrialised countries to control inflation, along with protectionism, production subsidies and export subsidy wars among some major agricultural producers, such as the European Union and the United States, combined with strong productivity improvements led to the collapse of agricultural prices in the mid-1980s and 1990s. This in turn appears to have discouraged investments in the rural sector of many developing countries, with negative consequences for the rural poor. The World Bank and other development banks cut the amounts of loans to agricultural and rural development projects, a decision that was influenced in part by low world agricultural prices that reduced the returns of those projects (Lipton and Paarlberg, 1990).

Swings in the value of the US dollar, influenced by variations in the monetary stance of the Federal Reserve, also contributed to variations in the nominal prices of agricultural commodities (Mundell, 2002; Orden 2002; Frankel, 2006). Shifts in capital flows (with associated booms and busts in developing countries), have had strong impacts on agricultural conditions world-wide as well. Capital outflows and devaluations during the 1980s debt crises in Latin American and Caribbean (LAC) countries and the simultaneous strong decline in overall growth during what has been called the "lost decade" affected production of livestock and dairy products and of raw materials for non-food manufacturing

products, whereas food crop production (which tend to be more tradable, and benefited from exchange rate adjustments) fared relatively better (López-Cordovez, 1987).

Another example is the sequence of financial crises between the mid-1990s and early 2000s, which disrupted the economies of many Asian and LAC countries. The 1997 financial crises in Asia led to the contraction of demand for agricultural products in world markets, while the economic problems in Brazil and Argentina in the late 1990s and early 2000s resulted in expanded world agricultural supplies, leading to the decline of world agricultural prices (IMF, 1999; Langley, 2000; Langley et al., 2000; Shane and Liefert, 2000).

The impact was not limited to those countries. Most of the capital flowing out of crisis countries largely went to developed countries, mainly the United States. Capital inflows appreciated the US dollar. As a consequence of all those factors, nominal and real prices of commodities at the end of the 1990s and early 2000s reached some of the lowest levels recorded, contributing to lower investments in the sector that was a factor later in the price spike of 2008. The current global economic crisis has opened a new phase in world economic conditions. Policies are still trying to correct the imbalances in fiscal, financial, and external accounts, with uncertain future implications for macroeconomic developments and their effects on agriculture (Orden, 2010).

In summary, while it makes sense to concentrate on the supply-side determinants of a positive enabling environment for agriculture in a sustained period of relatively high agricultural prices, discussing the domestic policy and investment conditions for agriculture in emerging and developing countries without considering the evolution of global macroeconomic conditions will miss an important component of the overall policy setting. It must also be recognised that those world conditions will not impact equally on these countries; rather those results will differ depending on different structural conditions and on the policies followed by governments.

Heterogeneity among regions and countries

Levels of agricultural growth and development are also related to the variety of agricultural conditions in different countries. The 2008 World Development Report (World Bank, 2008) divided developing countries into three groups, depending on the contribution of agriculture to growth and the importance of rural poverty. The groups were called "agriculture-based countries" (where agriculture contributes significantly to growth and the poor are concentrated in rural areas), "transforming countries" (where agriculture contributes less to growth but poverty is still predominantly rural), and "urbanised countries" (in which agriculture is not the main contributor to growth and poverty is mostly urban). Countries in Sub-Saharan Africa (SSA) represent the largest percentage in the first group; many countries from South and East Asia (SEA) and the Pacific and, to a lesser extent, North Africa and the Middle East belong in the second category; and LAC, but also Eastern Europe and Central Asia, are the main geographical regions for the third group.

Agricultural sectors in these groups of countries show distinct characteristics, as discussed in depth by Diaz-Bonilla and Robinson (2010). Agriculture in LAC is less important as a percentage of the GDP and the rural population is smaller compared to total population than in other regions. SSA and SEA fall on the other extreme, with agriculture production and rural population having larger incidence in those regions. LAC depends more on agricultural exports, and agriculture appears more productive (per unit of labour), uses more capital (using tractors as a proxy), and, after South Asia, is the region better served by roads. SSA and LAC have more available arable land per capita than Asian developing countries, but average holdings are far larger in LAC and land appears to be

distributed more unequally in LAC than Asia, with Africa in between. SSA has an availability of arable land that is comparable to LAC, but average holdings are far smaller and of similar sizes to those in Asia. SSA also shows the lowest values for the capital/technology and roads indicators, highlighting some of the opportunities and constraints to expand agricultural production in that region.

In terms of food insecurity indicators, SSA and SEA have a larger percentage of food insecure countries, and they are predominantly rural, while LAC has more countries in the neutral food-security category and are basically urban countries (Diaz-Bonilla et al., 2000). The same policy (such as maintaining domestic prices high to help producers or the opposite, keeping those prices low to help consumers) will have different impacts in these two types of countries.

The different regions also differ in the structure of their agricultural trade, which has been changing over time. Africa exports mostly to the EU and other African countries, but, lately, trade with Asia has increased significantly, surpassing intraregional trade. The export partners of LAC countries are mostly internal in the region, followed by the US and Canada, the EU, and Asia but with large differences from north to south on the continent (countries to the south tend to have lower levels of trade with the US than the northern ones). Developing countries in Asia sell mostly to other developing countries in the region and only after that to Japan and the EU (Diaz-Bonilla and Robinson, 2010).

This heterogeneity among developing countries has implications for the impacts of the enabling determinants of agricultural growth. For instance, an improvement of the terms of trade for agricultural products (say, by a devaluation of the local currency) will have a different production response in SSA, where producers face relatively more constraints in linkages to markets, infrastructure, capital, and technology, than in the other two regions. In SSA countries, the growing urban markets appear in several cases better linked to food aid and imports than to the producers in the domestic economy. In turn, the distributive effect will be different in small-farmer agricultural economies of Asia than in many LAC countries with dualistic agrarian structures and large populations of urban poor. In the latter countries improving relative prices for agriculture, at least on impact, will help relatively more large farmers while negatively affecting poor urban consumers. In addition, changes in macroeconomic and agricultural policies in Europe, for instance, could have a relatively greater impact on Africa than in Asia, due to their greater trade and financial links. The same can be said in the case of the US and a number of LAC countries. These differences in structure, performance, production, and trade must be kept in mind in analysing possible policy and other reforms to enhance agriculture's enabling environment.

Figure 1 (from Sala-i-Martin et al., 2013) has shown the GCI that defines three types of countries, depending on whether they have factor-driven, efficiency-driven, or innovation-driven economies. Sala-i-Martin et al. (2013) also identify countries in transition from the first to the second stage, and from the second to the third one, for a total of five categories, with the stage of development determined largely by the per capita income levels of countries. Table 1 cross-tabulates those five GCI stages with the three types of agricultural economies identified by the World Bank for developing countries. Illustrative examples of 36 countries are given in the cells defined by the GCI and World Bank categorisations. The selection of countries is simply to provide examples of developing countries for most of the cells (developed countries are not included in the three World Bank groups and therefore are not considered).

Table 1 offers a way of looking at the combination of factors that enable growth for the whole economy (which, as discussed, is important for the development of the agricultural sector) and the constraints and requirements posed by the type of agricultural and rural

conditions of a country. It is clear that factor-driven economies, in which the country as a whole still needs to address the four basic pillars for growth as delineated in the GCI (institutions, infrastructure, macroeconomic environment, and health and primary education) are largely those that fall under the World Bank's category of agriculture-based economies. Only Paraguay among agriculture-based economies included in Table 1 appears in the efficiency-driven economies, that are focusing on the efficiency enhancers of growth (pillars 5-10 in Figure 1) linked to higher education, the operation of goods, labour, and financial markets, technological readiness, and that have certain market size. On the other extreme, the urbanised developing economies in the classification of the World Bank do not appear as factor-driven economies in the GCI classification. Transforming economies in terms of their transition from agriculture-based to urbanised counties are largely classified as factor-driven or efficiency-driven in the GCI classification.

An implication is that for growth and development purposes, the enabling environment for agriculture is dependent on the economy-wide enabling environment. While sectoral progress can be made, one cannot expect agriculture's enabling environment to leap far ahead of the enabling environment across the entire economy.

Table 1. Cross-classification of 36 emerging and developing countries by GCI and the World Bank

	World Bank Classification		
GCI Classification	**Agriculture-based**	**Transforming**	**Urbanised**
Stage 1: Factor-driven	Ghana, Ethiopia, Kenya, Malawi, Nepal, Nicaragua, Nigeria, Senegal, Tanzania	Bangladesh, India, Pakistan, Viet Nam	
Transition (stage 1 to 2)		Egypt	Bolivia, Philippines, Venezuela
Stage 2: Efficiency-driven	Paraguay	Albania, China, Indonesia, Thailand	Bulgaria, Colombia, Ecuador, South Africa, Ukraine
Transition (stage 2 to 3)		Malaysia	Argentina, Brazil, Chile, Hungary, Mexico, Russia, Turkey
Stage 3: Innovation-driven			Slovenia

Source: Authors' tabulation.

2.3. Indices of growth and competitiveness determinants

As discussed above, there is a strong connection between determinants of overall economic growth and competitiveness among countries and the factors affecting agriculture. Thus, the GCI competitiveness-factors articulated in Figure 1 provide a framework that is a useful starting point in assessing components of the enabling environment for agricultural growth and competitiveness and for the selection of indicators of that environment. Greater specificity about agriculture is provided by some of the indicators of the EIU's GFSI and there are other relevant studies, existing databases and ongoing initiatives to identify, classify, select indicators and construct indices to quantify and rank the enabling factors for agricultural innovation, growth and competitiveness.

The GCI and issues arising in construction of indices

The first step in constructing an index is the choice of indicators for inclusion. Further details about the 12 pillars of the GCI (shown schematically in Figure 1) are presented in Table 2. As shown in the earlier figure, four pillars make up a block of "Basic Requirements" for competitiveness. These pillars address the quality of public and private

institutions and availability of public-good infrastructure, as well as macroeconomic policy and the quality of human capital as reflected in health conditions and primary education. The basic requirements are considered most important as determinants of competitiveness for factor-driven economies.

A second set of six pillars comprise a block on "Efficiency Enhancers" considered more relevant for efficiency-driven economies. Central to this block are measurements of the adequate operation of goods, labour and financial markets, complemented by measurements of higher education and technology readiness, and conditioned by market size faced by a country.

The third block of determinants of competitiveness is judged particularly relevant to innovation-driven economies. This block of "Innovation and Sophistication Factors" is comprised of two pillars: business sophistication and R&D innovation.

In constructing the GCI, each of the pillars 1-10 is comprised of two or more sub-pillars of key determinants selected as important to economic competitiveness. Each of these sub-pillars, and pillars 11 and 12, are comprised of one or more categories of determinants, and each category is comprised of one or more specific indicators. The indicators of the determinants affecting competitiveness are measurements either from primary data collected specifically for the GCI or secondary data available from other sources.

The primary data collected by the GCI is obtained through surveys of firms (Executive Opinion Surveys, EOS) in each country. For the 2012 report about 14 000 surveys were utilised, representing an average of 100 respondents per country. The surveys ask respondents to rank different dimensions from 1 (worse) to 7 (best) (Browne, Geiger, and Gutknecht, 2012). Although the GCI data-gathering methodology has been improved there are still some weaknesses that can be understood by comparing the GCI surveys with another potential source of information about the enabling environment for economic growth. The comparative source of information is the Enterprise Surveys (ES) conducted by the International Finance Corporation (IFC) of the World Bank.

The IFC/World Bank have been collecting since 2002 firm-level data using surveys of representative samples of the private sector in developing countries. The ES are usually face-to-face interviews with owners or high-level management of firms in different sectors and of different sizes, covering a broad range of topics related to the business environment, such as access to finance, corruption, infrastructure, crime, competition, and performance measures. Since 2002, there have been ES for about 130 000 companies in 135 economies. The data, methodology, and studies conducted using the ES are accessible at www.enterprisesurveys.org. A useful feature is that the ES distinguish a Food Sector within its manufacturing coverage, which provides information otherwise not available about this component within agricultural production and marketing value chains.

Comparing the ES of the IFC/WB with the EOS of the GCI there are several points to note. First, the sample of the EOS for the GCI is significantly smaller than the ES; the latter typically includes 1 200-1 800 interviews in larger economies, 360 interviews in medium-sized economies, and about 150 interviews in small economies. Second, the questions in the GCI survey ask the respondent executives for more open-ended opinions, while the ES tends to ask about specific problems faced by firms. For instance, there is a difference between asking how would the respondent rate the situation of corruption or of the electrical infrastructure in a country (from 1 to 7) versus asking what would be the amount of bribes as a percentage of sales that a firm like the one interviewed has to pay, or how many hours were lost to electric outages. The latter approach provides more comparable and objective information, while it is difficult to compare the meaning of an open-ended

ranking number across different countries and cultures. Third, for more open-ended, general questions, such as those asked for the GCI, there is always the question why only a specific type of agents in the economy have been asked for their views (in this case, executives from firms).

Despite these considerations, the structure and competitiveness methodology of the GCI are useful, even if the specific data may provide a less reliable comparative representation of country circumstances than the ES. While the ES of the IFC/WB generate a variety of indicators, they are not aggregated into single numbers to match relevant dimensions of a growth framework, as provided by the GCI.

Another methodological point to be considered relates to the interpretation of certain indicators intended to reflect the adequacy of operation or efficiency of markets. This is particularly relevant for labour markets, where some analysts consider that greater flexibility for employers is better (as seems to be the case in the GCI framework), while other studies suggest that more collaborative and shared approaches in determining wage and employment conditions may lead to better results not only in terms of equity but also efficiency (see for instance, Freeman, 2005).

Additional issues in constructing an index include normalisation of indicators, aggregation methods (such as arithmetic versus geometric) and the weights placed on each of the included measurements (Klugman et al. [2011] provides a detailed discussion). For the GCI the primary-data indicators are normalised as numbers between 1 to 7 and are aggregated arithmetically. There are also weights placed on each indicator and category within each sub-pillar, each sub-pillar within a pillar, each of the pillars within the three main blocks and, finally, on each main block. Within each category of competitiveness determinants, the selected specific indicators are given equal weight. Likewise, each category within a sub-pillar is given equal weight. Nine of the 12 pillars have two or more sub-pillars. For six of these cases an equal weight is given to each sub-pillar, while in three cases the weights on sub-pillars are uneven (pillars 1, 6 and 10). Within each main block, each pillar is also given an equal weight that depends on the number of pillars (25% in the basic requirements block, 17% in the efficiency-enhancers block and 50% in the innovation and sophistication factors block).

Although the indicators making up the GCI are purposefully selected so that the index reflects the expected determinants of competitiveness, the relatively uniform weights applied across the indicators can be described as a neutral position on their relative importance. An alternative, which is not utilised in the basic GCI weighting, would be to incorporate weights that reflected some evaluation of relative importance, for example, based either on elicited expert opinion or on econometric analysis of the impact of the various determinants on a quantifiable measurement such as economic growth rates.

This type of weights is applied at the highest level of the GCI evaluation. At this level, the weight placed on each main block differs among countries assigned to each stage of development. For example, for factor-driven economies (primarily those with per capita incomes below USD 2 000), the basic requirements block is given a weight of 60%, whereas the block on innovation and sophistication factors is given a weight of only 5%. By the opposite end of the GCI stages of development, for innovation-driven economies (primarily those with per capita incomes above USD 17 000), these weights have shifted to 20% and 30%, respectively. Thus, at this level of index construction, a substantial judgment is made about how the determinants of competitiveness differ at different stages of economic development.

Table 2. Pillars of the Global Competitiveness Index

BASIC REQUIREMENTS **1st pillar: Institutions 25%** A. Public institutions 75% 1. Property rights 20% (1.01 Property rights; 1.02 Intellectual property protection) 2. Ethics and corruption 20% (1.03 Diversion of public funds; 1.04 Public trust in politicians; 1.05 Irregular payments and bribes) 3. Undue influence 20% (1.06 Judicial independence; 1.07 Favouritism in decisions of government officials) 4. Government efficiency 20% (1.08 Wastefulness of government spending; 1.09 Burden of government regulation; 1.10 Efficiency of legal framework in settling disputes; 1.11 Efficiency of legal framework in challenging regulations; 1.12 Transparency of government policymaking; 1.13 Provision of government services for improved business performance) 5. Security 20% (1.14 Business costs of terrorism; 1.15 Business costs of crime and violence; 1.16 Organised crime; 1.17 Reliability of police services) B. Private institutions 25% 1. Corporate ethics 50% (1.18 Ethical behaviour of firms) 2. Accountability 50% (1.19 Strength of auditing and reporting standards; 1.20 Efficacy of corporate boards; 1.21 Protection of minority shareholders' interests; 1.22 Strength of investor protection)
2nd pillar: Infrastructure 25% A. Transport infrastructure 50% (2.01 Quality of overall infrastructure; 2.02 Quality of roads; 2.03 Quality of railroad infrastructure; 2.04 Quality of port infrastructure; 2.05 Quality of air transport; infrastructure; 2.06 Available airline seat kilometres B. Electricity and telephony infrastructure 50% (2.07 Quality of electricity supply; 2.08 Mobile telephone subscriptions; 2.09 Fixed telephone lines)
3rd pillar: Macroeconomic environment 25% (3.01 Government budget balance; 3.02 Gross national savings; 3.03 Inflation, 3.04 Government debt; 3.05 Country credit rating)
4th pillar: Health and primary education 25% A. Health 50% (4.01 Business impact of malaria; 4.02 Malaria incidence; 4.03 Business impact of tuberculosis; 4.04 Tuberculosis incidence; 4.05 Business impact of HIV/AIDS; 4.06 HIV prevalence; 4.07 Infant mortality; 4.08 Life expectancy) B. Primary education 50% (4.09 Quality of primary education; 4.10 Primary education enrolment rate)
EFFICIENCY ENHANCERS **5th pillar: Higher education and training 17%** A. Quantity of education 33% (5.01 Secondary education enrolment rate; 5.02 Tertiary education enrolment rate) B. Quality of education 33% (5.03 Quality of the educational system; 5.04 Quality of math and science education; 5.05 Quality of management schools; 5.06 Internet access in schools) C. On-the-job training 33% (5.07 Local availability of specialised research and training services; 5.08 Extent of staff training)
6th pillar: Goods market efficiency 17% A. Competition 67% 1. Domestic competition (6.01 Intensity of local competition; 6.02 Extent of market dominance; 6.03 Effectiveness of anti-monopoly policy; 6.04 Extent and effect of taxation; 6.05 Total tax rate; 6.06 Number of procedures required to start a business; 6.07 Time required to start a business; 6.08 agricultural policy costs) 2. Foreign competition (6.09 Prevalence of trade barriers; 6.10 Trade tariffs; 6.11 Prevalence of foreign ownership; 6.12 Business impact of rules on FDI; 6.13 Burden of customs procedures; 6.14 Imports as a percentage of GDP) B. Quality of demand conditions 33% (6.15 Degree of customer orientation; 6.16 Buyer sophistication)
7th pillar: Labour market efficiency 17% A. Flexibility 50% (7.01 Co-operation in labour-employer relations; 7.02 Flexibility of wage determination; 7.03 Hiring and firing practices; 7.04 Redundancy costs; 6.04 Extent and effect of taxation) B. Efficient use of talent 50% (7.05 Pay and productivity; 7.06 Reliance on professional management; 7.07 Brain drain; 7.08 Female participation in labour force)
8th pillar: Financial market development 17% A. Efficiency 50% (8.01 Availability of financial services; 8.02 Affordability of financial services; 8.03 Financing through local equity market; 8.04 Ease of access to loans; 8.05 Venture capital availability) B. Trustworthiness and confidence 50% (8.06 Soundness of banks; 8.07 Regulation of securities exchanges; 8.08 Legal rights index)
9th pillar: Technological readiness 17% A. Technological adoption 50% (9.01 Availability of latest technologies; 9.02 Firm-level technology absorption; 9.03 FDI and technology transfer) B. ICT use 50% (9.04 Internet users; 9.05 Broadband Internet subscriptions; 9.06 Internet bandwidth; 9.07 Mobile broadband subscriptions; 2.08 Mobile telephone subscriptions; 2.09 Fixed telephone lines)
10th pillar: Market size 17% A. Domestic market size 75% (10.01 Domestic market size index) B. Foreign market size 25% (10.02 Foreign market size index)
INNOVATION AND SOPHISTICATION FACTORS **11th pillar: Business sophistication 50% (**11.01 Local supplier quantity; 11.02 Local supplier quality; 11.03 State of cluster development; 11.04 Nature of competitive advantage; 11.05 Value chain breadth; 11.06 Control of international distribution; 11.07 Production process sophistication; 11.08 Extent of marketing; 11.09 Willingness to delegate authority; 7.06 Reliance on professional management)
12th pillar: R&D Innovation 50% (12.01 Capacity for innovation; 12.02 Quality of scientific research institutions; 12.03 Company spending on R&D; 12.04 University-industry collaboration in R&D; 12.05 Government procurement of advanced technology products; 12.06 Availability of scientists and engineers; 12.07 PCT patent applications; 1.02 Intellectual property protection)

Source: Schwab, K. and X. Sala-i-Martin, 2013.

The GFSI

A relatively new index with quite a different focus is the EIU's Global Food Security Index (GFSI) (EIU, 2013). The three blocks of this index and their components are shown in Table 3. Food security is assessed as depending on affordability, availability, and quality and safety. Among the components of these blocks are indicators that reflect national incomes and poverty, domestic agricultural supply conditions, government measures and actions (GMAs) affecting agricultural production, food safety nets and food safety, and dietary availability of various nutrients. Unlike the GCI, the GFSI includes several indicators that specifically address agriculture and might be included in an assessment of the enabling environment for agricultural growth and competitiveness. The indicators within the GFSI come from secondary sources and assessments and scoring by EIU analysts. For the GFSI, two sets of weights are provided (http://foodsecurityindex.eiu.com/). The default option is equal weight assigned to each indictor (called neutral weights). Alternatively, a set of weights provided by an expert panel can be applied, or any user can define their own weights and construct a customised index.

Table 3. Components of the Global Food Security Index

1) AFFORDABILITY 1.1) Food consumption as a share of household expenditure; 1.2) Proportion of population under global poverty line; 1.3) Gross domestic product per capita; 1.4) Agricultural import tariffs; 1.5) Presence of food safety net programmes; 1.6) Access to financing for farmers
2) AVAILABILITY 2.1) Sufficiency of supply [2.1.1 Average food supply; 2.1.2 Dependency on chronic food aid]; 2.2) Public expenditure on agricultural R&D; 2.3) Agricultural infrastructure [2.3.1 Existence of adequate crop storage facilities; 2.3.2 Road infrastructure; 2.3.3 Port infrastructure]; 2.4) Volatility of agricultural production; 2.5) Political stability risk
3) QUALITY AND SAFETY 3.1) Diet diversification; 3.2) Nutritional standards [3.2.1 National dietary guidelines; 3.2.2 National nutrition plan or strategy; 3.2.3 Nutrition monitoring and surveillance]; 3.3) Micronutrient availability [3.3.1 Dietary availability of vitamin A; 3.3.2 Dietary availability of animal iron; 3.3.3 Dietary availability of vegetal iron]; 3.4) Protein quality; 3.5) Food safety [3.5.1 Agency to ensure the safety and health of food; 3.5.2 Percentage of population with access to potable water; 3.5.3 Presence of formal grocery sector]

Source: EIU, 2013.

Recent initiatives and studies of agriculture's enabling environment

There are a number of other recent initiatives that are trying to identify, classify, and rank different GMAs related to agricultural growth and competitiveness. Unlike the GCI and GFSI, these other initiatives either are not designed to provide, or have not yet been sufficiently developed to make available, broad-based comparisons among emerging and developing countries based on index performance. In an Annex, seven of these initiatives are summarised: 1) OECD's Policy Framework for Investment in Agriculture (PFIA); 2) the joint OECD-FAO Monitoring African Food and Agricultural Policies (MAFAP); 3) World Bank's Doing Business in Agriculture (DBA) which is related to the World Bank's Doing Business Index; 4) World Bank's Agribusiness Indicators (ABI); 5) Growth-

related indicators from IFPRI; 6) The measurements and indicators included in the OECD's PSE/GSSE database, and 7) OECD's Product Market Regulations (PMR) methodologies.

There are also other current initiates (not summarised in the Annex) that are developing (or propose to develop) indices related to one or more aspects of the enabling environment for agricultural growth. These include a joint initiative of the Danish Ministry of Foreign Affairs and USAID to undertake the development of an Agricultural Transformation Index (ATI, 2013), the Agribusiness Regulation and Institutions Index (USAID, 2012), a proposed African Farming and Rural Investment Climate Index (IFPRI, 2012), and the *OECD Green Growth Strategy Framework*, which attempts to develop a framework to monitor progress on green growth in agriculture. The goal of the latter is to identify relevant, succinct and measurable statistics for further developing green growth indicators in the agricultural sector in OECD countries. The choice of specific indicators was primarily governed by the objective of capturing key aspects of a low-carbon, resource efficient agricultural sector (OECD, 2013b).

An additional useful study is *Agricultural Innovation Systems: A Framework for Analysing the Role of the Government* (OECD, 2013c). This study presents some key questions and possible performance indicators for a broad set of GMA determinants of agricultural innovation. The report does not propose specific indicators to be used from among those identified or that a specific index be constructed.

A subsequent scoping paper refers to this report as providing a framework for assessing "the role of governments in improving agricultural innovation …to help countries review, in a coherent and systematic way, the impact of a wide range of economy-wide and sectoral policies on agricultural innovation" (OECD, 2013d). Comparable to the GCI, but with a specific reference to effects on agricultural innovation, this study identifies a set of GMAs affecting the innovations systems including the macroeconomic situation, governance and the regulatory environment (including intellectual property rights), financial market regulation, tax, competition, trade and investment policies, infrastructure and rural policy, labour and land policies, education, health and information policies, and consumer and environmental policies. The scoping paper calls for case studies to be undertaken in two or three countries during 2013-14 both to provide useful information for these particular countries and to "provide the opportunity to review available information, and identify information and analytical gaps, and areas for further improvement in terms of data, analysis and policy."

Another relevant recent study is FAO's *Enabling Environments for Agribusiness and Agro-Industries Development* (Konig et al., 2013). This report finds, as described briefly above, that the agribusiness and agro-industries enabling environments are highly influenced by broad macro-level forces. This report also finds that additional business climate factors specific to agriculture and rural areas (such as efficient land markets and tenure systems and availability of rural finance and risk management products) are essential as well. Working within the notion of the business climate focused mainly on supply side issues, the report draws upon and summarises results from 20 in-depth country studies presented at four regional workshops organised by FAO and partner institutions between 2006 and 2008. Regional differences in the most constraining factors are noted and discussed in this report.

Parallel to the three blocks related to stages of development in the GCI, the conceptual framework presented by Konig et al. (2013), drawing on Christy et al. (2009), divides enabling factors for agribusiness and agro-industrial competitiveness into three hierarchical categories: essential enablers (trade policy, infrastructure, land tenure and property rights); important enablers (financial services, R&D, standards and regulations); and useful

enablers (business linkages and development services and ease of doing business). Similar to the growth diagnostics of Hausmann et al. (2005) and the OECD *Policy Framework for Investment in Agriculture* (OECD, 2013e; see discussion in the Annex), Konig et al. (2013) suggest that their hierarchy could be used as a checklist of issues to be addressed by specific countries. However, they are hesitant about the cost-effectiveness and feasibility of constructing a cross-country index for comparisons of the enabling environments specific to agribusiness and agro-industry, in part because even within these sectors there are significant differences in competitiveness-facilitating factors among various subsectors such as crops versus livestock.

Taking these and other considerations into account, the various existing indicators, indices and studies, along with the seven measurement projects reviewed in the Annex, provide different lists and classifications of GMAs and other factors that may help or hinder agricultural growth, and they present a variety of indicators. Some of those indicators characterise a governmental intervention itself (e.g. the percentage value of an ad-valorem tariff, or the level of expenditures in certain governmental activities, public investments or transfers). Others look at the immediate impact of certain measures (e.g. how much time is needed to comply with various regulations). Still others show what may be happening to economic agents as a result of multiple influences, and not only from governmental interventions decisions (e.g. how many farmers are receiving credit from banks). Finally, some indicators may refer to structural contextual factors related only in the long term to agricultural or economy-wide policies (such as literacy or life expectancy).

Among the seven projects creating indicators of GMAs as determinants of agricultural growth that are summarised in the Annex, the different empirical approaches have specific insights to offer. MAFAP work is in part closely linked to OECD PSEs and GSSEs. Therefore, it shows transfers to producers and budget expenditures and investments in general public agricultural services. MAFAP also expands the coverage of indicators to include investments in the rural economy and the functioning of agricultural value chains. This relates to the issue of the rural nonfarm sector as the linkage between supply and demand and the quality of rural infrastructure and services as the geographical locus where agricultural production takes place. The OECD PFIA and WB DBA and ABI exercises show that laws and regulations (which may or may not have a budgetary counterpart in PSE and GSSE) can have important implications for agricultural growth and competitiveness. Also the way the government operates, including the administration of justice, the presence or absence of corruption, political stability and an efficient management of public resources, affects agricultural growth.

Another point to be noticed is that general approaches to improving the business climate, such as the PFIA or DBA, refer generically to the food and agricultural value chain. Different types of actors have not been distinguished; in particular the business climate projects do not differentiate among types of farmers (from near landless to commercial operators). MAFAP distinguishes among different actors in the value chain, but also does not separate types of farmers. Yet, in some cases the business climate that would help small farmers requires different measures than the one that supports commercial operators (FAO, 2012).

Additional sources of information

In addition to the indices, studies and initiatives already described, it is useful to note several other sources of information and indices that cover certain aspects of an enabling environment for agriculture. The Human Development Index (HDI) calculated by the UN Development Program (UNDP) for its annual Human Development Report is probably the

earliest attempt at assessing countries' performance on development issues. The HDI was initiated in 1990 in conjunction with the basic-needs approach to development in order to highlight that growth had to translate into real improvements in measurable dimensions of human well-being. The basic HDI includes three dimensions: education, health, and income. That index has been extended and refined since 2010 by the construction of parallel indices: the Inequality-Adjusted HDI, the Gender Inequality Index, and the Multidimensional Poverty Index. The database includes an important range of indicators, many of which are collected from national sources through the UN statistical system.

The World Development Indicators (WDI) database of the World Bank collects a significant amount of information on economic, social, and environmental dimensions, including data for the private sector from the bank's Doing Business project. Doing Business gathers data on measures of business regulations and their application in about 185 countries. It looks mostly at regulations for small and medium firms throughout their life cycle, from starting up, to different operations during the existence of the firm, to closing down (www.doingbusiness.org).

The WDI also includes the country ratings from the Worldwide Governance Indicators (WGI) project of the World Bank and the Brookings Institution. The WGI project is described as reporting "aggregate and individual governance indicators for 215 economies over the period 1996–2011, for six dimensions of governance: Voice and Accountability, Political Stability and Absence of Violence, Government Effectiveness, Regulatory Quality, Rule of Law, Control of Corruption." These aggregate indicators use information from enterprises, citizens and experts, based on surveys in industrial and developing countries (http://info.worldbank.org/governance/wgi/index.asp).

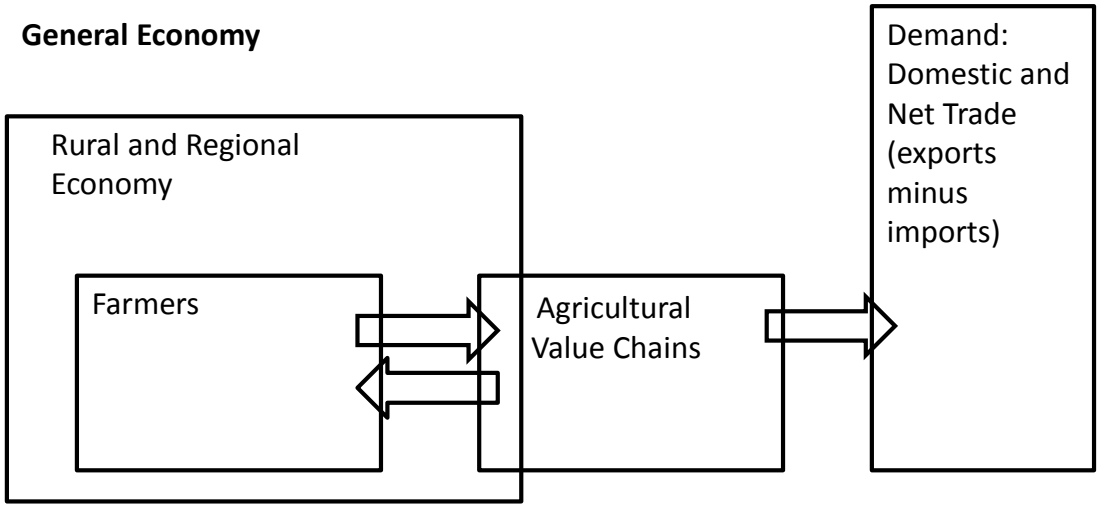
The Millennium Challenge Corporation (MCC), an initiative of the United States to provide foreign aid to countries according to certain performance criteria, has also collected relevant information. The MCC does not prepare an index but uses indicators (that in several cases, but not all, overlaps the HDI and World Bank databases) and thresholds to identify countries with policy environments in which the funds from the MCC are considered to have more impact. The indicators cover three areas "Ruling Justly," "Investing in People" and "Encouraging Economic Freedom." The criteria utilised by the MCC to select those indicators are as follows: "1) developed by an independent third party; 2) utilise an analytically-rigorous methodology and objective, high-quality data; 3) are publicly available; 4) have broad country-coverage; 5) are comparable across countries; 6) have a clear theoretical or empirical link to economic growth and poverty reduction; 7) are policy-linked (i.e. measure factors that governments can influence); and 8) have appropriate consistency in results from year to year" (www.mcc.gov/documents/reports/reference-2012001114001-fy13-guide-to-the-indicators.pdf).

3. A typology to identify components of agriculture's enabling environment

Drawing on the preceding literature review, this section presents a typology to link together two main dimensions of the enabling environment for agricultural growth: the categories of GMAs affecting the enabling environment for agricultural growth and competitiveness and the focus of these measures and activities within the economy. The latter includes the supply side (at the farm level), the demand side (which depends on the functioning of the whole economy and the opportunities for trade) and the links between them. Figure 3 shows an initial schematic of the different levels of the economy. Farmers are embedded geographically in the rural and regional economy and economically in agricultural value chains, which cover the flows of products, inputs, equipment, and

services related to the activities of primary production, processing, transportation and commercialisation of agricultural products. These three levels are encompassed by the general economy and country-wide governance and institutions; this level includes the final demand for agricultural products (unprocessed or transformed), which has a domestic and an external (net trade) component.

Figure 3. Schematic of economic components of agriculture's enabling environment



Source: Authors' conceptualisation.

3.1. Structure of the typology

Table 4 builds on this schematic of the economy to present the typology integrating the GMA affecting agricultural growth and competitiveness across the different levels of the economy. The basic premise of this typology is that given the complexity of the issues involved it is constructive to disentangle the relevant components of the economy on one axis and the governance (public action) components of the enabling environment on the other. Table 4 also serves as a relatively compact representation of a check-list to evaluate GMAs affecting agricultural growth and competitiveness. Within the cells of Table 4, various relevant indicators or indices are given that, based on the previous review, can be utilised to rank countries in the context of the effects of the governance issue described by a given row on a certain level of the economy.

The columns of Table 4, distinguish at opposite ends between farmers (second column) and the general economy (last column). In between are two columns characterising the key linkages of agriculture to the nonfarm economy: the rural/regional economy and agricultural value chains. A more granular analysis of the agriculture's enabling environment may have to divide farmers between small-holders and family farms and commercial operators. It is useful to separate the rural and regional economies (which provide the geographical and local governance settings for food and agricultural production) from the food and agricultural value chains (which are the market linkages for specific products between inputs, outputs and final demand). Finally, it is important to have the component of the general economy, considering that its growth and stability are crucial to providing a stable context for production and investment and markets for agricultural and food production domestically and through international trade.

Among the rows of Table 4, agricultural policies are supplemented by a range of economy-wide GMAs and their outcomes, selected largely in line with the pillars of the

GCI. One difference from the GCI with specificity to agriculture is to include land and water markets along with goods, labour and financial markets. A second difference is to include environmental governance (the last row) to take sustainability of the enabling environment into account. Agricultural policies are divided into those on-farm and general services, in accordance with the methodology applied by the OECD to distinguish policy measures covered by the PSEs and by the GSSEs. This level of generality could be complemented by more detailed lists of specific measures and activities disentangled in separate rows in further analysis.

Given the construction of Table 4, with the structure of the rows along the line of the GCI, there exist a fairly complete set of indicators and index values to fill in the last column on the general economy. There might be controversies over the GCI pillars, their specific components, the weights they are assigned, or with the quality of the data utilised. Nonetheless, the substantial resources that go into its construction and its recent prominence make the GCI pragmatic to use as an input into an index of agriculture's enabling environment. From the GFSI, several specific indicators are included in cells of the first column on farmers. Also included in Table 4 are measures of agricultural R&D and total public expenditures (available from IFPRI) and indicators from other sources: the ES and WDI database of the World Bank; the HDI from UNDP; the MCC database; and some other UN data sources. However, a number of the cells are left empty, particularly regarding the rural and regional economy and the food and agricultural value chains, because such indicators do not exist, or the preceding review has not identified indicators comparable across countries.

Table 4. Typology of government measures and actions across levels of the economy and selected available indicators

Government measures and actions		Farmers (from near landless to commercial farms)	Rural and regional economy	Food and agricultural value chains (non-farm components)	General economy
Agricultural policies	**Farms and Agribusiness**	PSE (OECD); NRA (Anderson and Valenzuela)		CSE (OECD); selected components	Agriculture/non-agriculture terms of trade (National Accounts); RRA (Anderson and Valenzuela)
	General services	GSSE (OECD); selected components	GSSE (OECD); selected components	GSSE (OECD); selected components	
Economy-wide policies	**Institutions**			Food safety/health agency (GFSI 3.5.1); Crime and corruption for food sector firms (ES WB)	Institutions (GCI P1);Political stability affecting food security (GFSI 2.5); Ruling Justly (MCC); Worldwide Governance Indicators (WB and Brookings Institution); Homicides rate (WDI WB)
	Infrastructure	Private crop storage (GFSI 2.3.1); Agricultural irrigated land (WDI WB)	Agricultural/rural Infrastructure (GFSI 2.3); Improved rural water source (rural/urban), Access to improved sanitation facilities (WDI WB)	Energy, water and transportation indicators for food sector firms (ES WB)	Infrastructure (GCI P2); Technical readiness (GCI P9); Port Infrastructure (GFSI 2.3.3); Logistics performance, electrification, telephones, internet connections (WDI WB); Energy, water and transportation indicators economy-wide (ES WB)
	Macroeconomic environment	Total public expenditure on agriculture as per cent of agricultural GDP (IFPRI)	Fiscal data for some local and provincial governments (IMF)		Macroeconomic environment (GCI P3); Exchange rate misalignment (Cline and Williamson; IMF)
	Health/education (including social safety nets)		Literacy (rural/urban) (UN Social Statistics)	CSE (OECD); selected components	Health and primary education (GCI P4); Higher education and training (GCI P5); Presence of food safety nets (GFSI 1.5); Health and education indicators (HDI UNDP; WDI WB)
	Goods markets			Tax/regulations and other business indicators for food sector firms (ES WB)	Goods market efficiency (GCI P6); Doing Business indicators); taxes on income, goods and services, and trade, Cost of business start-up procedures (WDI WB); PMR (OECD)

Table.4. Typology of government measures and actions across levels of the economy and selected available indicators *(cont.)*

Government measures and actions		Farmers (from near landless to commercial farms)	Rural and regional economy	Food and agricultural value chains (non-farm components)	General economy
Economy-wide policies	**Land and water markets**	Arable land resources (WDI WB); Renewable freshwater resources (WDI WB); Land rights and access (MCC); Annual freshwater withdrawals (WDI WB); Land holdings GINI indices (FAO)			
	Labour markets	Employment in agriculture, Child employment in agriculture (WDI WB)		Proportion of workers in food sector firms offered formal training, Proportion of unskilled workers, Per cent of firms identifying labour regulations or an inadequately educated workforce as a major constraint (ES WB)	Labour market operations (GCI P7); Labour force education levels (WDI WB)
	Financial markets	Access to finance by farmers (GFSI 1.6)		Per cent of food sector firm investment/working capital financed by banks, Per cent of firms that consider finance a constraint (ES WB)	Financial market development (GCI P8); Financial availability indicators (WDI WB); Access to Credit (MCC using IFC data)
	Higher education / Technology / Innovation	Public agricultural R&D expenditure as per cent of agricultural GDP (IFPRI); Cereal yields, Agricultural machinery, Fertiliser consumption (WDI WB)		Per cent of food sector firms with internationally-recognised quality certification, Per cent of firms using technology licensed from foreign companies (ES WB)	Higher education and training (GCI P5); Business sophistication (GCI P11); R&D Innovation (GCI P12); Research and development expenditure (WDI WB); Graduates in science and engineering (HDI UNDP)
	Environment	Change in forest area, Population living on degraded land (HDI UNDP); GHG net emissions/removals by land use change and forestry, Droughts, floods, extreme temperatures, Agricultural methane and nitrous oxide emissions (WDI WB)		Water pollution by food industry (WDI WB)	Greenhouse gas emission, Impact of natural disasters, Natural resource depletion (HDI UNDP)

3.2. Flow of the typology

The logic of the typology shown in Table 4 can be illustrated as follows, again recognising that indicators are missing from the table for many growth and competitiveness determinants. With respect to farmers, in the case of sectoral policies, most interventions are captured in the OECD PSE, while a range of economy-wide safety net policies may address farmers and other consumers through conditional and unconditional transfers. The agricultural policies affect primarily the supply side of the economy while economy-wide consumer transfers affect primarily the demand side, but with possibly significant supply-side impacts if recipients, for instance, are also rural households engaged in agriculture. In the case of public spending benefitting farmers, many of the important ones are GSSE measures.

Much larger, economy-wide measures affect farmers through the provision of diverse public services including health, education, housing, energy (not farm related), roads, information and communications technology (ICT). It is important to determine the rural/urban allocation of those expenditures to ascertain whether urban bias (Lipton, 1977) is still present. However, usually available data is not disaggregated in this way. Laws and regulations can be enacted affecting land tenure, water use, labour markets, energy and environmental decisions, or to establish a framework for farmers' co-operatives. Farmers are also affected by economy-wide criminal and civil law and its enforcement. The institutions through which the policies, investments and laws and regulations become operative include farmers' public-private consultative bodies and more broadly the public administrative agencies and the courts and mediations bodies.

Moving to the rural and regional economies there may be differential agricultural programmes or economy-wide taxes or subsidies (including through trade measures) with regional/locational implications. Income redistribution policies may be reflected in differential social security and other payments to rural households or by region. In the case of public investments, regional effects may arise from some GSSE measures or from provision of economy-wide public services. There are also key laws and regulations with impact on the rural economy, from the framework for the legal operation and funding of state and local governments, to controls on water systems and other infrastructure, to zoning regulations or movement restrictions on agricultural products. A crucial aspect of the performance of public institutions in the rural and regional economies is control of crime and violence, since without a peace and security in the countryside agricultural activities will not develop. Regional economies are affected through laws and regulations affecting labour and financial market operations. Relevant institutions include public-sector enterprises which may provide some of the basic services (energy, transportation, telecommunications), regional development bodies, and regional public-private consultation bodies.

The column corresponding to food and agricultural value chains includes a variety of potential public decisions and actions affecting agricultural growth. The government may impose taxes (including import taxes) or provide subsidies to firms producing seeds, fertilisers, machinery or energy. Some of those policy interventions are captured in the PSE when they relate directly to farmers, but there may be taxes and subsidies that affect firms in the value chain other than farmers for which costs or benefits are not passed through to farmers. Agricultural value chain firms may be affected by social security (contributive) transfer requirements to their employees, and safety net transfers to consumers will affect demand for agricultural products and thus, indirectly, the firms in

the agricultural value chains. Government expenditures may also benefit non-farm agents and markets in the value chains through R&D or provision of logistics infrastructure such as for marketing or storage. The government will also provide economy-wide infrastructure such as for transportation that will have significant effects on agricultural value chains. Laws and regulations affecting the firms in the value chain include those related specifically to contract farming and SPS regulations and standards, as well as economy-wide laws and regulations related to competition, contracting and business regulation, energy and environmental rules, and so on. Public sector (state-owned) enterprises may provide input and output marketing, storage, transportation and other services, with varying impacts on the efficient and equitable operation of those markets. Other public institutions may provide sectoral public-private consultation bodies for policy dialogue or establish contract and conflict mediation bodies.

Regarding the general economy, most of the legal and public institution performance factors relevant to growth and competiveness are incorporated in the GCI pillar on institutions, along with security against terrorism and organised crime and the ethics and accountability of private business. Some elements of the legal and public institution performance factors are related to the efficiency indicators included in the goods, labour and financial market pillars. Neither of the relative price variables (the real exchange rate and the internal terms of trade between the agricultural and non-agricultural sectors) emphasised in the agricultural growth and development literature are included in the GCI macroeconomic pillar; therefore they are included separately in Table 4. The impacts on agriculture from general economic policies also involve a larger number of variables and channels, including labour markets, income and demand effects, inflation, interest rates, credit availability, and the possibility of macroeconomic and financial crises. Many of these channels are reflected in the GCI indices included in the general economy column of the table.

Various GMAs and their combinations will not be equally relevant under all circumstance and at all stages of development. The most basic requirement is that a country is not suffering from internal or external war, and that crime and violence in the countryside are controlled. In those cases, the relevant policies for agriculture are related to military, diplomatic, and police activities. Also, a severely constraining natural resource endowment will not be compensated by the best of the business climates. Provided that a country has a minimum level of peace and order, and of productive natural resources, then it is possible to move to the discussion of what else in an enabling environment can help with agricultural growth and competitiveness.

Another level of problems comes from the functioning of the whole economy. If the country suffers from low and variable growth because of macroeconomic instability related to balance of payments, high unemployment, debt, or banking crises, and/or very high and unstable inflation, then it is not likely that the agricultural sector will perform well. Sometimes, the low and volatile overall growth is related to political and social instability, which usually spills over into economic instability. Political instability is also associated with low government efficiency (which reduces the provision of public goods), legal unpredictability (which reduces the expected returns of economic activity), and corruption (which acts as a tax on the potential returns of farmers and entrepreneurs in general).

Low economic growth and instability affect domestic demand for agricultural products, and most likely hampers also exports. Therefore, a key factor for agricultural growth, adequate demand that can be transformed into adequate returns, will not exist.

Yet, having a general economy that is growing is not enough: that growth has to generate demand that can be effectively transmitted to the domestic agricultural market and the country must be able to competitively engage in external markets.

Given the conditions mentioned so far (peace and lack of violent conflict and criminality, some natural resources, some macroeconomic stability, a minimum of political steadiness, government efficiency and decency, and a neutral trade regime) then public investments and other measures and actions to enable agricultural growth will have a higher payoff. Measures linked to the development of the rural economy and strengthening value chains appear crucial in this regard, as well as the provision of public goods for farmers, particularly agricultural R&D, education, and health. Considering the latter point, endemic, debilitating, and deadly diseases in the countryside (from malaria to HIV/AIDS) may be a constraint to agricultural growth as limiting as a very bad resource base.

These and other important considerations about the enabling environment for agricultural growth and competitiveness are reflected to varying degrees in the indicators included in Table 4. Caveats arise from inadequate data, the choices (or absence) of specific measurements, and the simplicity of the assigned weights for aggregated indicators such as the pillars of the CGI shown in Table 4. Also, indices lack the depth of intensive case studies, cluster analysis or formal econometric analysis. In particular, by combining different dimensions into a single number, indices may be hiding different "shapes" or "geometries" of the several components feeding into the indicator, while cluster analysis or principal component approaches, although with their own limitations, would handle better the issue of multidimensionality. Still, indicators and indices of the enabling environment are useful to gather quantitative information from different sources, to summarise the situation within a single country, or to allow parsimonious comparisons across countries. They can also be utilised to increase public awareness about the current situation regarding different topics and areas and their evolution over time, and to help policy makers to focus on the issues that may require specific attention.

4. An illustrative index of agriculture's enabling environment

This section brings the considerations discussed above together by constructing a preliminary Agriculture Growth Enabling Index (AGEI) utilising some of the existing indicators in Table 4. The more complex checklist outlined in that table, is reduced to a more manageable set of representative dimensions for agricultural growth and competitiveness. The exercise is designed to show how such an index for agriculture can be constructed to summarise a wide array of available information in a structured manner and then be used to provide cross-country comparisons or single-country evaluations using either the index itself or its components. The intent is to illustrate the strengths and limitations of such an index through this exercise with the preliminary AGEI. Better indices can eventually be constructed, and expansion and refinement of the included set of indicators will allow further depth of analysis. However, the forms of analysis an index can provide are captured in this illustrative exercise.

Constructing any index to rank the enabling environment for agricultural growth and competitiveness faces several challenges. First, there is the issue of the quality of the data and the cost of gathering and updating it. Herein, the preliminary AGEI is restricted to existing data sources, which as noted each have strengths and weaknesses. The typology for an index of the enabling environment for agricultural growth and competitiveness shown in Table 4 has been constructed building on a foundation from the GCI

framework. For this illustrative exercise, the GCI is one key source of indicators in the AGEI, notwithstanding previous comments about its limitations. In the future, it would be useful to utilise other indicators, such as the ES, that are based on larger samples and with more specific questionnaires for most of the primary indicators utilised in the GCI. Cost considerations may preclude developing new primary data sources for such indicators.

Second, as noted there are indicators and indices that signal policy actions, or more generally, policy interventions; others may show the direct results of those interventions; still others may reflect outcomes and impacts, resulting from a variety of factors, and not only government interventions; and finally there may be indicators of structural conditions, some of which may be influenced by governmental interventions only in the long run. Each one of these is among the components likely to determine growth and competitiveness, and they need to be integrated into a full analysis. However, it has been pointed out that there may be clear trade-offs in designing indices that focus on policy levers that can be utilised by governments (actionable indicators) versus indicators that describe the structural conditions in different countries but may not necessarily point to clear governmental interventions (DANIDA and USAID, 2012).

4.1. Structure of the preliminary AGEI

Keeping the above points in mind, for the preliminary AGEI, selection among indicators is limited primarily to a subset of the GCI pillars (Sali-i-Martin et al., 2013), selected components of the GFSI index (first available version, EIU, accessed online, June 2013), and several other indicators specific to agriculture. The indicators selected for the preliminary AGEI mostly measure circumstances within each country around the early 2010s. The components and structure of the index are shown in Table 5. The preliminary AGEI consists of four blocks that include 15 indicators, often themselves an index comprised of multiple individual indicators in its original construction. Each of the components of the AGEI is weighted equally within its block with the exception of public R&D expenditures on agriculture which have been given a weight twice that of each of the remaining two subcomponents within Pillar A (see discussion below).

The first block reflects governance quality as reflected through the GCI macroeconomic and institutions pillars and an index of political stability affecting food security drawn from the GFSI. The second block reflects investment in and availability of capital. This block includes two indicators related to human capital (health/education from GCI and presence of food safety nets from GFSI) and one indicator reflecting physical capital (the infrastructure pillar from GCI). The third block reflects economy-wide effectiveness of markets (as reflected in the CGI pillars on labour, goods and financial markets).

Table 5. Structure of the preliminary Agriculture Growth Enabling Index

Governance (20% weight; equal shares on each subcomponent) Macro (GCI P3) Institutions (GCI P1) Political stability affecting food security (GFSI 2.5)
Capital (20% weight; equal shares on each subcomponent) Health/Education (GCI P4) (human capital) Presence of food safety nets (GFSI 1.5) (human capital) Infrastructure (GCI P2) (physical capital)
Markets (20% weight; equal shares on each subcomponent) Goods market operations (GCI P6) Labour market operations (GCI P7) Financial market operations (GCI P8)
*Agriculture/*Rural (20% weight on each pillar; equal shares on each subcomponent within a pillar with the exception of double weight on public agricultural R&D expenditures) Pillar A: Access to financing for farmers (GFSI 1.6) Public agricultural R&D expenditure as a per cent of agricultural GDP (IFPRI) Land market rights and access (MCC) Pillar B: Agriculture Infrastructure (GFSI 2.3) Index of intensification (authors based on WDI) Index of availability of land and water (authors based on WDI)
Country coverage Brazil, Chile, China, Colombia, Egypt, Ethiopia, India, Indonesia, Kazakhstan, Kenya, Mexico, Pakistan, Russia, Senegal, S. Africa, Tanzania, Thailand, Turkey, Ukraine, Viet Nam

Source: Authors' tabulation.

The fourth block of the preliminary AGEI has a specifically agriculture and rural focus. The specificity of the indicators in this block complements the economy-wide measures and gives an explicit agricultural orientation to the index. This block is composed of two pillars, and each of these pillars is given equal weight of 20% in the preliminary AGEI, so 40% of the weight is on this agricultural component of the index. Each so the other three blocks is given an equal weight of 20%.

Pillar A in the agriculture/rural block reflects institutional conditions amenable to policy decisions in the short to medium term. In particular, finance availability to farmers (from GFSI) refines the corresponding general-economy financial markets pillar from GCI. The AGEI does not include a general measure of public investments in technology and innovation for the overall economy, but includes agricultural R&D expenditures taken from IFPRI (2013) and for some countries from the OECD's PSE/GSSE database. The GFSI includes a similar measure of agricultural R&D but the IFPRI series appears to be a more reliable data source. The third indicator in this pillar addresses the status of land markets, based on the land rights and access indicator of the MCC.

Pillar B in the agriculture/rural block includes indicators that reflect available capital and natural resources amenable to policy influence only in the medium to long term. Among these, the quality of available agricultural infrastructure (from GFSI) again refines a corresponding general-economy pillar on infrastructure from the GCI. Pillar B also includes one indicator on the intensification of agriculture (constructed as a

combined index of fertiliser use and tractors per hectare, based on data from the WDI and FAO), and another indicator of availability of land and water (also a combined indicator, using arable land per rural population and water availability per capita, both constructed from the WDI and FAO).[2]

Overall, the AGEI reflects the enabling environment for agricultural growth and competitiveness through a broad range of economy-wide policies and through positive effects assigned to agricultural policies reflected by the indicators in Pillar A of the agriculture/rural block in the short and medium term, and in the long term by the public and private capital stock and resource conditions reflected in Pillar B.

The preliminary AGEI does not include either the OECD PSE or GSSE measure. Two issues arise in regarding inclusion or exclusion of these two variables. First, while the GSSE provides useful, more-detailed information about certain public expenditures that would be beneficial to agricultural growth and competitiveness, neither the GSSE nor the PSE are available for many of the countries in the set selected for inclusion in the illustrative AGEI analysis, or for additional emerging and developing countries that might be added to the analysis. However, for a growing number of emerging economies, the OECD's PSE/GSSE database is available and currently includes Brazil, Chile, China, Indonesia, Kazakhstan, Mexico, Russia, South Africa, Turkey and Ukraine. With the future inclusion of Colombia and Viet Nam, its GSSE component will provide an attractive source of data for more detailed analysis of public expenditures supporting agriculture's enabling environment in a sub-set of emerging economies.

Second, it is ambiguous how the PSE ought to be included in an index assessing the degree to which there is a positive enabling environment for agricultural growth and competitiveness. Some expenditures in the PSE reflect policies that address market failures and externalities that the definition of a positive enabling environment of non-distorting and stable policies adopted for this report would encompass. Others provide production and/or trade distorting support in output or input markets that are not

2. Comments on an earlier draft noted that combining water and land into a single indicator may not accurately reflect the strength or weaknesses of the natural resource base of a country: it may have a lot of land but if there is no water (or vice-versa), an index combining both components would show intermediate values that may be misleading as an indicator of the natural resource base suitable for agriculture. This is a valid conceptual point, already noted in the main text: any combined index, including the AGEI as a whole, may be aggregating very different "geometries" of the underlying components into single numbers that may look similar. In the case of complementary components such as land and water, the point has additional significance. At a practical level, however, and in the absence of a better single indicator of natural resources, aggregating land and water in this preliminary exercise may not lead to large discrepancies in rankings considering that land availability is "arable land per capita" defined by FAO, which includes land already being used for crops (requiring some level of water availability). That indicator is combined with a variable "renewable internal freshwater resources per capita," also from FAO, which in countries like Kazakhstan that has less water, reduces the overall index significantly, while in Chile (and to a smaller degree Colombia), which have the opposite profile, increases it. Also, it should be noted that even if the index of availability of land and water is divided into its two components, to the extent that the overall weights are not modified, the AGEI will not change by separating them. The issue would then be what weights to use, which as mentioned in the text, does not have clear answers. Finally, as also noted in some comments, beyond natural resources what matters is the adequate governance of them at the agricultural level. Although general governance indicators exist, specific ones for the agricultural sector do not seem to be available.

consistent with the definition of a positive enabling environment. This concern can also be raised about an indicator such as total expenditures on agriculture as a share of agricultural GDP. That indicator was included in an earlier version of the AGEI under the maintained hypothesis that for the emerging and developing countries to which the index is applied in this preliminary analysis, a more substantial expenditure on agriculture is positively related to the enabling environment for growth and competitiveness. However, in view of the on-going work undertaken by the FAO to separate public capital expenditures in agriculture from recurrent expenditures (Fabi, 2013), it was decided to eliminate that indicator and increase the weight of the indicator of R&D as a per cent of agricultural GDP as a general proxy not only for expenditures on agricultural technology but also for other public investment in and for agriculture. As soon as the work differentiating the investment component of total government expenditures is completed, then the ratio of capital expenditures to agricultural GDP could be utilised in the AGEI.

The concerns about inclusion in the AGEI of a variable such as the PSE or total expenditures on agriculture parallel similar issues that arise in construction of indices such as the GCI or GFSI. In these two indices, for example, import tariffs count negatively in the index (i.e. all else equal, higher tariffs result in a lower index score). Agricultural expenditures enter the GCI, which includes the developed countries that historically have subsidised agriculture, in only one explicit indicator: with higher agricultural policy costs (indicator 6.08, see Table 2) presumably decreasing goods market efficiency. In the GFSI, various agricultural policy measures have positive effects on the index, as described above, but again higher import tariffs, including agricultural tariffs, reduce the GFSI score.

It would be desirable to have in the AGEI a fifth and sixth block on the rural/regional economy and agricultural value chains, with indicators about their density and efficiency included in the preliminary index. However, indicators for these blocks are not readily available. Potentially, several indicators for rural areas might be extracted from World Bank data bases. With further work the section related to food industries in the Enterprise Surveys of the World Bank could provide useful indicators for the food industry component of value chains. The studies and initiatives to evaluate the enabling environment for agriculture summarised above (Section 2.3) and in the Annex might also eventually provide additional information.

For the illustrative analysis, the preliminary AGEI is applied to a purposefully selected set of 20 emerging and developing countries, as opposed to a randomly selected or relatively complete global set. Criteria for inclusion of the countries included those emerging economies that are the focus of OECD country analyses (either OECD members or otherwise) and countries chosen relative to this set to provide reasonable geographic coverage among relatively larger countries. These 20 countries are listed in Table 5. They are also included among the 36 countries for which classifications by the GCI and World Bank are cross-tabulated in Table 1 (the exception is Kazakhstan, which does not seem to be included among the three categories of the World Bank [2008]).

4.2. Index analysis

General performance of countries

The performance of countries on the AGEI and their numerical score on this index are shown in Table 6. For purposes of comparison, ranks are also shown for the 20 countries based on their overall GCI scores (the complete index, not just the components included in the AGEI). For additional comparison, the performance of countries on the

agriculture/rural block of the AGEI, which has a weight of 40% and does not include any of the indicators from the GCI, are also shown in Table 6. Numerical scores are not shown for these two comparative rankings, since differences in the construction across the various indices, leading, for example, to different average scores and variances of these scores for the selected countries, make such comparisons of the raw numerical index values across different indices not very informative.

Table 6. Performance of countries on AGEI, its agriculture/rural areas block and the GCI

AGEI		Agriculture/Rural	GCI
Score	Rank		
74.91	Chile	Chile	China
65.48	Brazil	Colombia	Chile
64.60	China	Thailand	Thailand
63.76	South Africa	Egypt	Turkey
61.58	Thailand	Brazil	Brazil
60.66	Russia	South Africa	Indonesia
60.15	Colombia	Russia	Kazakhstan
59.53	Mexico	China	S. Africa
59.44	Turkey	Mexico	Mexico
58.35	Kazakhstan	Turkey	India
56.98	India	Kazakhstan	Russia
55.59	Ukraine	Ukraine	Colombia
54.95	Indonesia	Viet Nam	Ukraine
53.63	Viet Nam	Kenya	Viet Nam
52.60	Egypt	India	Kenya
50.37	Kenya	Indonesia	Egypt
45.90	Tanzania	Tanzania	Senegal
42.12	Senegal	Senegal	Tanzania
41.54	Pakistan	Pakistan	Ethiopia
41.46	Ethiopia	Ethiopia	Pakistan

Note: AGEI scores may vary in this table from 0-100. The higher the score the more enabling environment is provided by a given country as assessed in this preliminary index.

Source: Authors' tabulation.

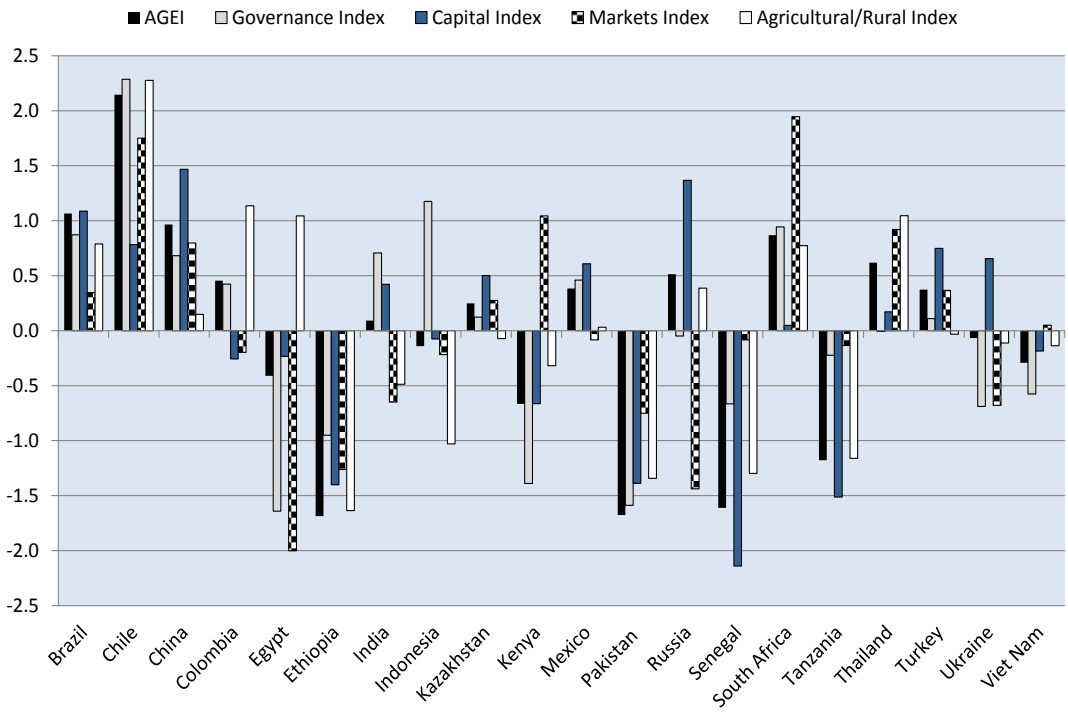
The performance of countries has both similarities and differences as shown in Table 6. Chile, Brazil and Thailand rank in the top 5 countries on all three indices. China ranks among the top 5 countries on two of the indices, but is not among the top 5 on the agriculture/rural index. South Africa ranks 4th on the AGEI and 6th on its agriculture/rural block, but lower on the GCI. Colombia is second on the agriculture/rural index, but ranks lower on both AGEI and GCI.

In turn, Ethiopia, Pakistan, Senegal and Tanzania rank among the lowest 5 countries on all three indices, with Kenya also low on all three. Indonesia ranks low on the agriculture/rural index, but somewhat higher on the AGEI and much higher on the GCI, while Egypt ranks highly on the agriculture/rural index compared to the AGEI and GCI. The remaining countries (India, Kazakhstan, Mexico, Russia, Ukraine and Viet Nam) rank in the middle 10 countries on all three indicators.

Performance across countries on the AGEI blocks and indicators

Relative scores on the AGEI overall and its four main blocks are shown in Figure 4. To account for the differences in averages of scores of the 20 countries and the variances of these scores across the index and its blocks, this figure shows the normalised score of each country on the AGEI index and on each component. Specifically, for the AGEI and each of its four blocks the average for the 20 countries has been subtracted from each country value and the resulting country value divided by the standard deviation for the series, to create series with zero mean and unit standard error. For example, a value of 2 means that the observation for a given country is 2 standard deviations above the average (which is zero) for the 20 countries. The relative rankings shown in Table 6 for the AGEI index appear in Figure 4 as positive (above average) values for those countries with the highest scores and negative (below average) values for those with the lowest scores.

Figure 4. AGEI and its sub-component blocks (normalised)



Source: Authors' tabulation.

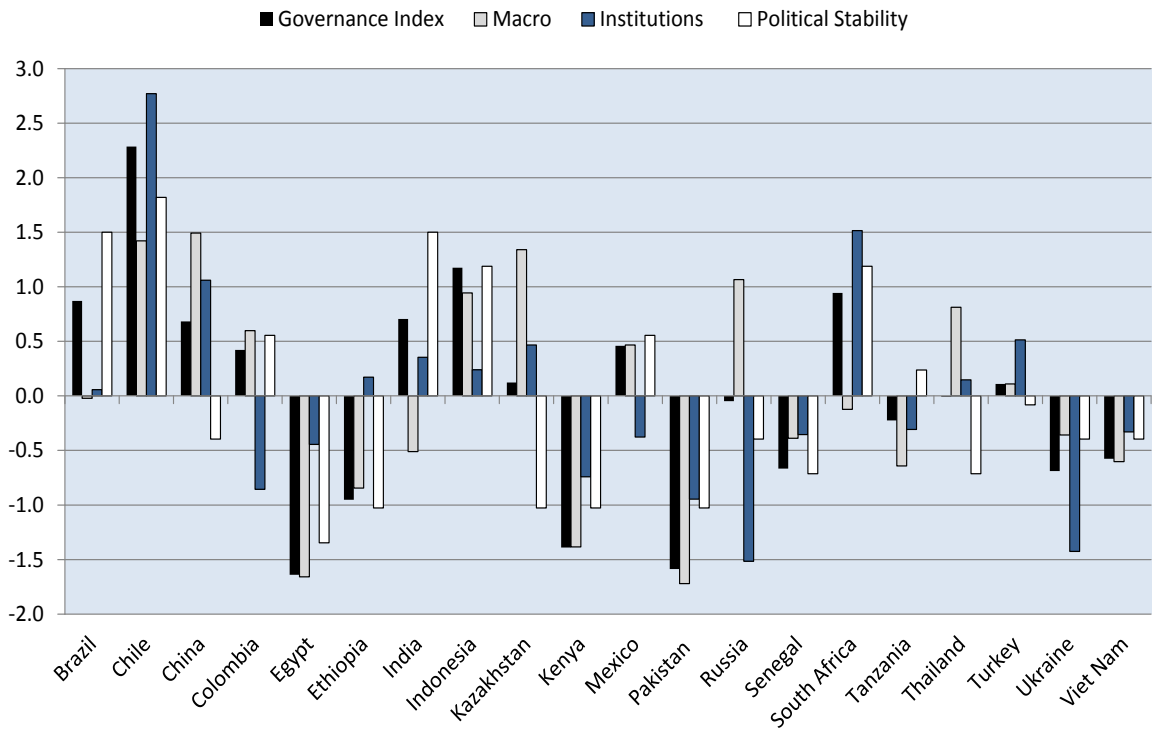
Looking across the components of the AGEI, several countries (Brazil, Chile and China) appear relatively strong across the four blocks. More noticeable is the variability in relative scores among the main blocks for many countries. Even Brazil, Chile and China show this variation and differ in which components account for their high overall scores (governance and capital for Brazil; governance, markets and agriculture/rural for

Chile; and capital for China). South Africa scores relatively lower compared to the other countries on capital and much higher on markets, while Mexico scores relatively low on the markets and agriculture/rural indices. India also scores relatively low on the markets and agriculture/rural indices compared to its scores on the other two main blocks.

Among the countries with lowest AGEI scores, Ethiopia, Pakistan, Senegal and Tanzania score relatively poorly on all four blocks. Egypt scores above the average of the countries on the agriculture/rural index. For a number of other countries, there is quite a mixed set of relative scores: for example, Indonesia, Kenya, Russia and Ukraine each score on at least one main block of the AGEI well above and well below the other countries. Some of the reasons for those results are further discussed below.

Similar decompositions can be made for the indicators within each main block of the AGEI. These are shown in Figures 5-10. In each case, the scores for one block (or Pillar A and B of the agriculture/rural block) and for each component of that block/pillar are normalised as described above. Within the governance block (Figure 5), the best overall scores are achieved by Brazil, Chile, Indonesia and South Africa. Chile scores relatively well on all three indicators in the governance block, but the other three countries score relatively less well on one or two indicator (institutions for Indonesia; macroeconomics for South Africa; macroeconomics and institutions for Brazil). The lowest governance scores are those for Egypt, Ethiopia, Kenya and Pakistan.

Figure 5. Disaggregation of governance block (normalised)

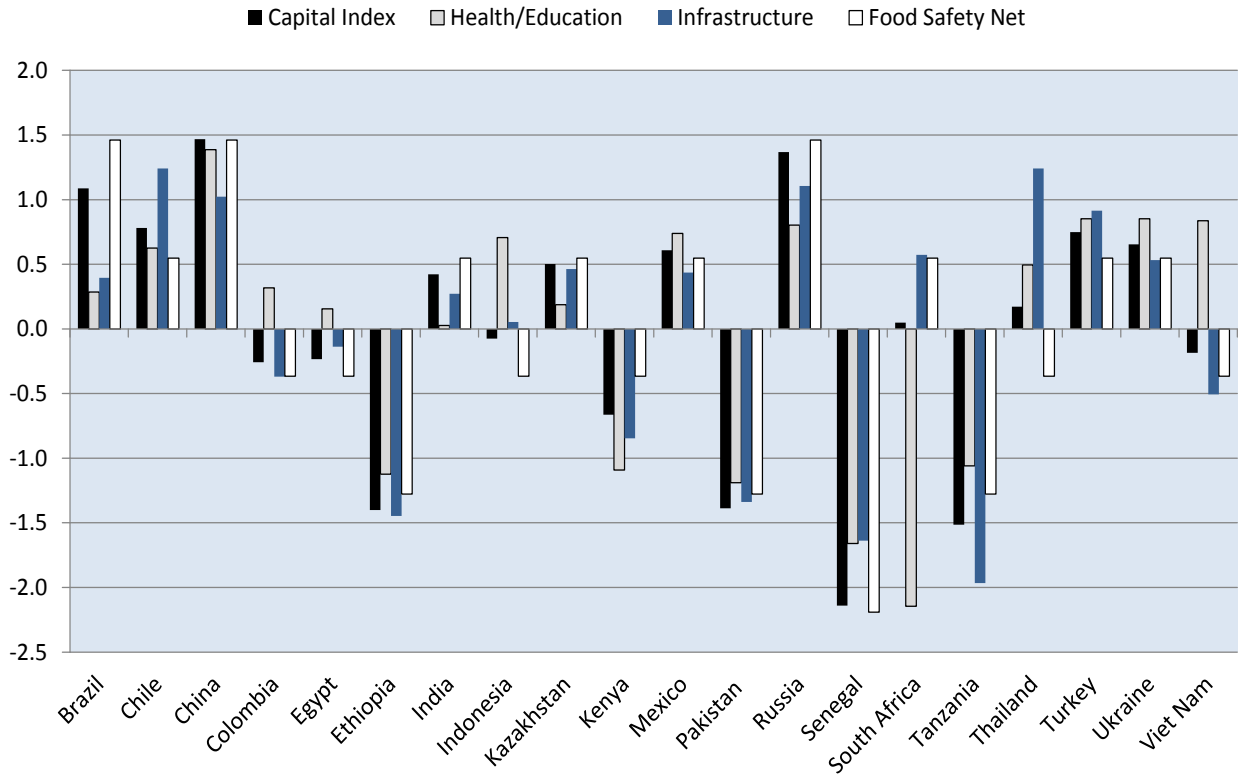


Source: Authors' tabulation.

Within the capital block (Figure 6), the best overall scores are achieved by Brazil, Chile, China, Russia and Turkey, while the lowest scores are those for Ethiopia, Kenya, Pakistan, Senegal and Tanzania. Relative scores across the three components of the capital index are fairly similar within a country for the countries with the highest and lowest overall scores, although Brazil scores relatively higher on availability of food

safety net programmes than on the other capital indicators. The relatively low overall capital index score of South Africa is explained by its low score on the health/education indicator, while Thailand scores relatively high on infrastructure but lower on availability of food safety nets. Viet Nam scores relatively highly on health and education but below the average of other countries on the other two indicators in the capital block. For the other countries, the variability among the indicators is within a smaller range.

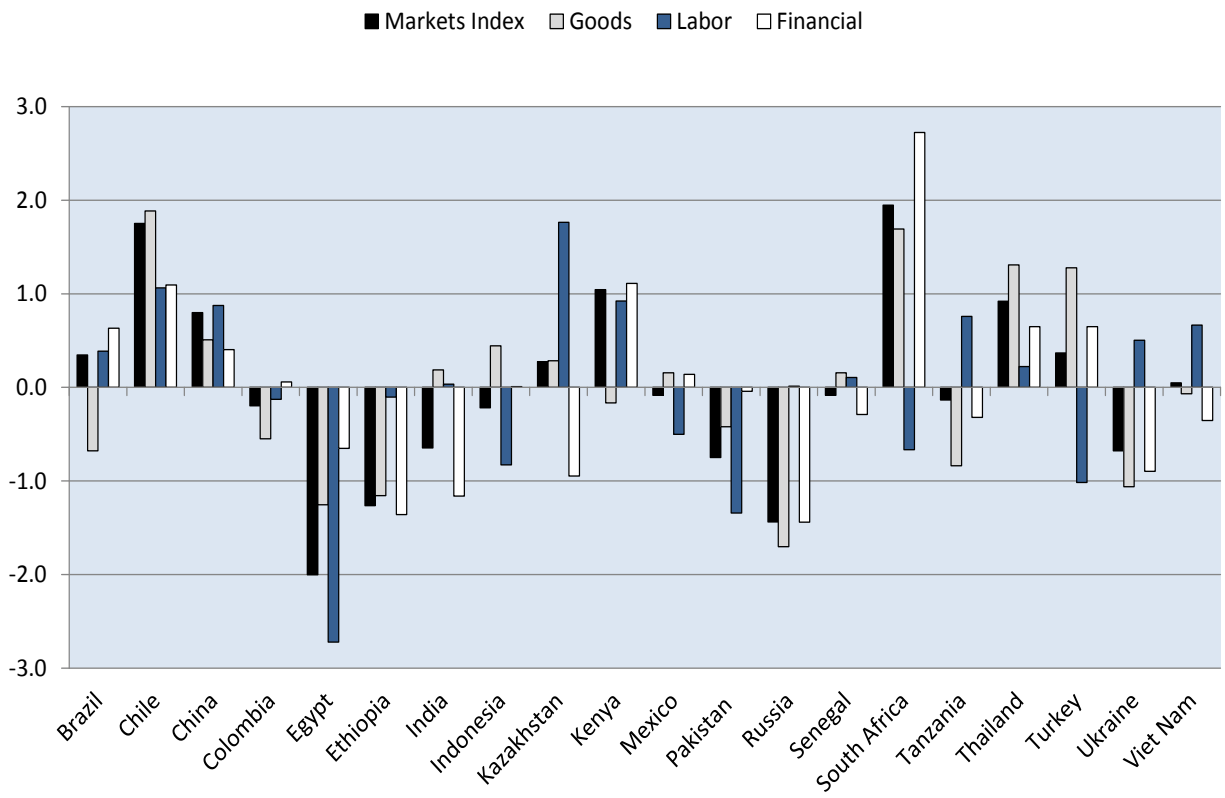
Figure 6. Disaggregation of capital block (normalised)



Source: Authors' tabulation.

In terms of the operation of markets (Figure 7), the best scores are achieved by Chile and South Africa, with Chile scoring relatively well for all three market indicators while South Africa is below average for labour markets but particularly high-scoring for financial markets. The countries with the lowest score are Egypt, Ethiopia and Russia, with Ethiopia and Russia scoring relatively better compared to other countries on labour markets than for goods or financial markets.

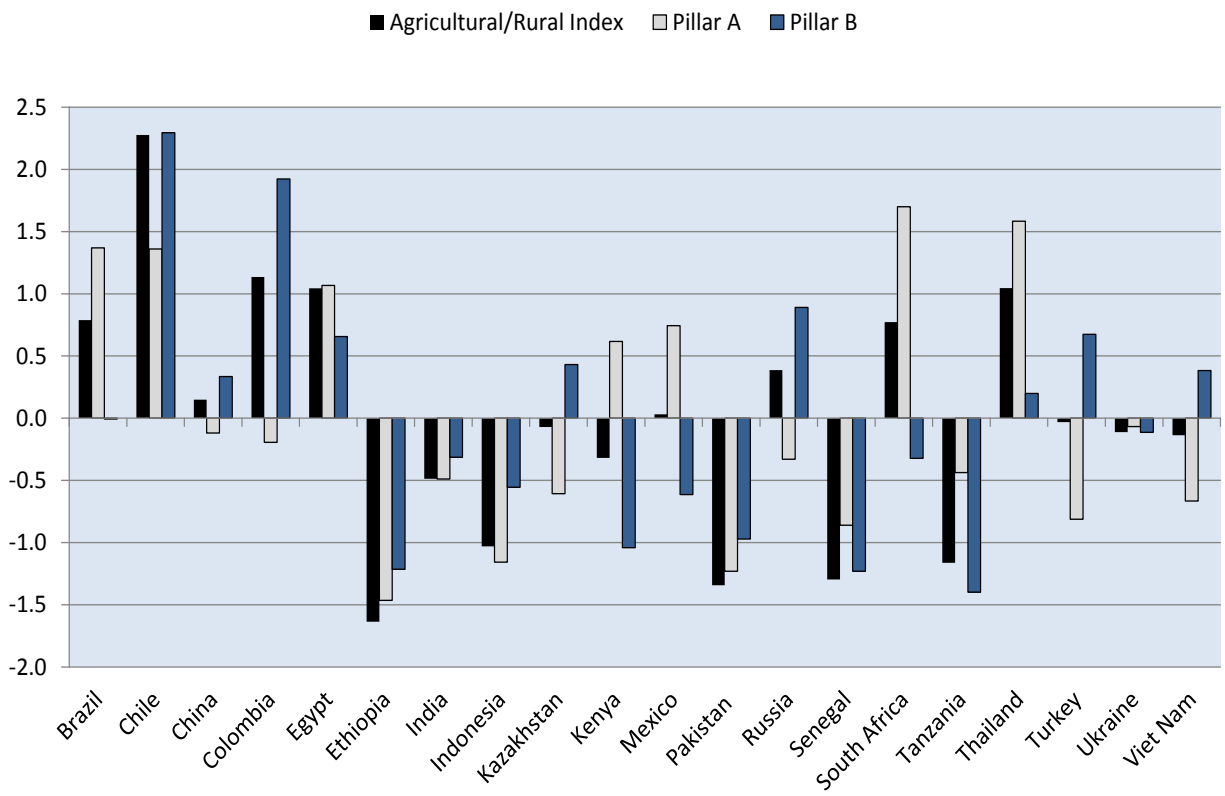
Figure 7. Disaggregation of markets block (normalised)



Source: Authors' tabulation.

Countries also show substantial variability across the agriculture/rural indicators. The normalised agriculture/rural index and its two pillars are shown in Figure 8. The highest overall scores are achieved by Chile, Colombia and Thailand. For Chile and Colombia, scores are higher relative to other countries for Pillar B than for Pillar A, while the reverse is the case for Thailand. Under the interpretation of Pillar A as more amenable to policy decisions in the short and medium run, while Pillar B represents various current or permanent resource limitations, this scoring suggests Chile and Colombia are doing relatively less well on policy dimensions relative to their resources, with the opposite for Thailand. The countries scoring lowest on the agriculture/rural index are Ethiopia, Pakistan, Senegal and Tanzania.

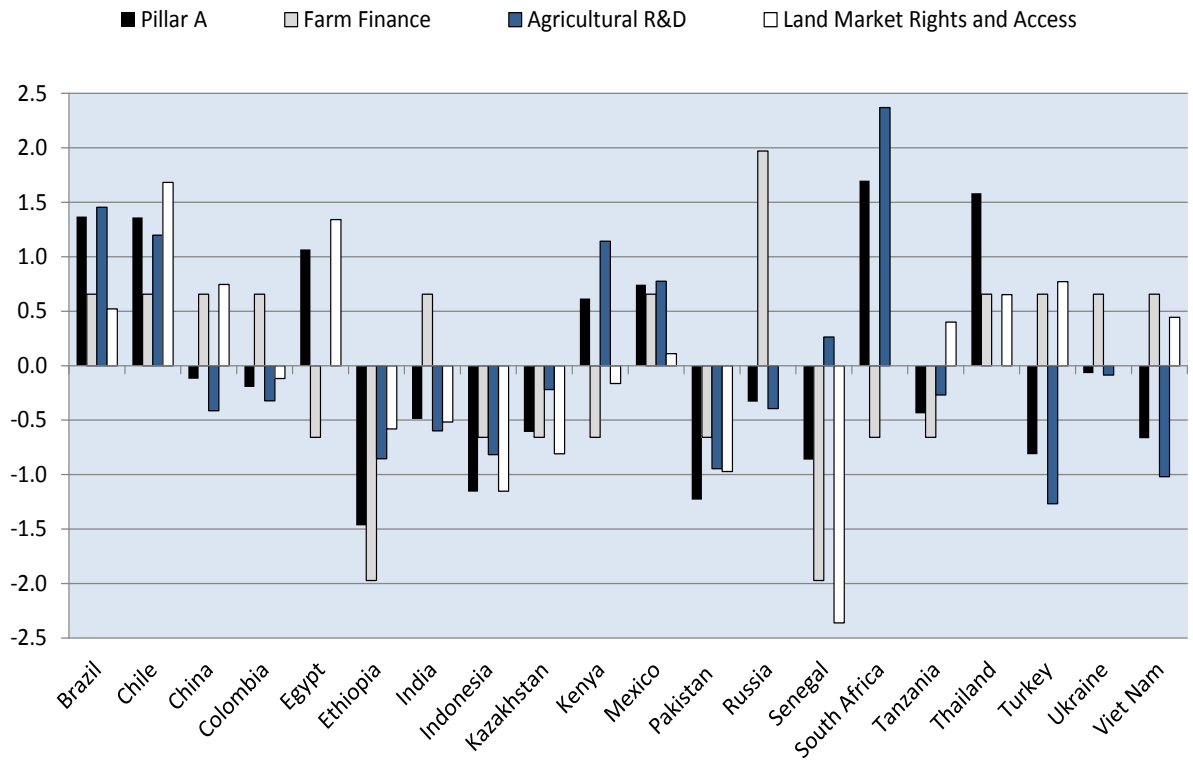
Figure 8. Disaggregation of agricultural/rural blocks (normalised)



Source: Authors' tabulation.

Disaggregation of Pillar A of the agriculture/rural index is shown in Figure 9. The highest overall scores are achieved by Brazil, Chile, South Africa and Thailand. Brazil and Chile score relatively high on all indicators. South Africa scores particularly high relative to other countries on agricultural R&D, but below the average on farm finance. The lowest scores for Pillar A are those of Ethiopia, Indonesia and Pakistan. Values of R&D expenditures are not available for Thailand and Egypt, nor are scores on land market rights and access for Russia, South Africa or Ukraine. Values for these indicators for these countries do not enter their overall scores in Pillar A.

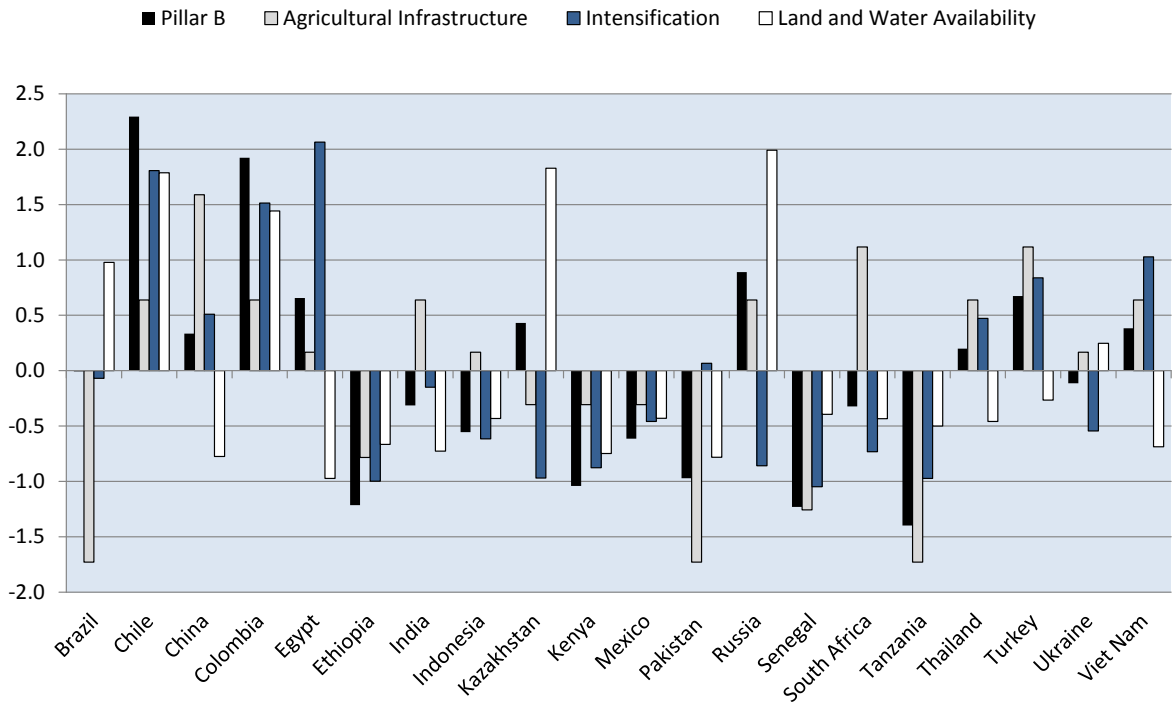
Figure 9. Disaggregation of agricultural/rural blocks - Pillar A (normalised)



Source: Authors' tabulation.

Disaggregation of Pillar B of the agriculture/rural index is shown in Figure 10. Chile and Colombia score highest overall and in both cases score higher on intensification and land and water availability than on agricultural infrastructure. Brazil, Kazakhstan and Russia also score relatively high compared to other countries on land and water availability, but their overall scores on Pillar B are brought down by lower relative scores on agricultural infrastructure (Brazil) or intensification (Kazakhstan and Russia). The lowest overall scores for Pillar B are those of Ethiopia, Kenya, Pakistan, Senegal and Tanzania.

Figure 10. Disaggregation of agricultural/rural blocks - Pillar B (normalised)



Source: Authors' tabulation.

Performance of selected individual countries across the AGEI indicators

Figures 5-10 focus attention on the comparison among the countries across the blocks of the AGEI or among the indicators making up a specific block. A second way to examine the same information as presented in these figures is to look at the scores across all components from an individual country perspective to assess, along growth diagnostics lines, where the country has particular strengths and weaknesses compared to other countries.

To illustrate this approach, Brazil and China are both among the 5 highest ranked countries on the AGEI. Despite its strong performance, Brazil is relatively weak on the markets and agriculture/rural indices compared to the governance and capital indices. Among the market indicators, Brazil's score relative to other countries is lowest for goods markets, and among agriculture/rural indicators Brazil scores relatively lowest on agricultural infrastructure. In its areas of relative strength, for governance Brazil scores lower relative to other countries on macroeconomics and institutions than it does on political stability, and on the capital index Brazil is very strong on availability of food safety nets but not as strong on health/education or, again, infrastructure. By way of

comparison, although China scores relatively well on all blocks of the AGEI, within the blocks its relative weaknesses are on political stability, financial markets, agricultural R&D expenditures and the limitations it faces on land and water availability. These results are largely consistent with more in-depth analyses for Brazil and China.

Kenya and Ethiopia are among countries scoring at the lower end on the AGEI. Kenya is weakest among the blocks of AGEI on governance but relatively strong on markets. Within the governance block, Kenya scores lowest on macroeconomics and political stability. Despite its relative strength on markets, Kenya ranks below the average of the countries on goods markets. Within the capital block, Kenya scores lowest relative to other countries on health/education, and within the agriculture/rural block its scores are lowest for Pillar B, indicating it faces relatively severe long term constraints on agricultural growth and competitiveness, particularly an existing lack of intensification of its agricultural producers.

By way of comparison, Ethiopia is one of the weakest countries on all four blocks of the AGEI. Like Kenya, is weakest within the governance block on macroeconomics and political stability. Ethiopia scores uniformly below other countries on the indicators in the capital block, but performs somewhat better on labour than goods and financial markets. Within the agriculture/rural block, opposite to Kenya, Ethiopia has a relatively lower score on Pillar A than Pillar B, suggesting short or medium term policy reforms might improve its performance given the longer term resource circumstances of the country.

As a final example of AGEI-based growth diagnostics for a specific country, India is a major emerging market. India ranks among the middle countries on the AGEI. It scores above the average of other countries on the governance and capital blocks, but below the average on markets and agriculture/rural blocks. India's political stability score accounts for its relatively high governance performance and its strongest score within the capital block is for availability of food safety nets.

Within the markets block, India scores worst relative to other countries on financial markets. It is somewhat below the average of countries on both pillars of the agriculture/rural block. Within Pillar A, India scores relatively well on farm finance but below the average of other countries on the indicators for agricultural R&D and land market rights and access. Within Pillar B, India scores above average on existing agricultural infrastructure, but below the average of other countries on its land and water availability, again indicative of long term constrains it faces in achieving agricultural growth and competitiveness.

The examples presented above show that what the AGEI does is bring different dimensions together in a parsimonious and comparable manner to help focus discussion, which is essentially the limit of what any index can accomplish.

4.3. AGEI and agricultural growth

The preceding analysis examines performance of the 20 selected countries relative to averages across the 15 components of the AGEI. A final evaluation relates to the underlying motivation for constructing an index of the enabling environment for agricultural growth and competitiveness. In principle, if the index effectively measures and reflects determinants of growth or competitiveness, that relationship should be evident in the data. It has been noted (Section 2.1) that growth regressions usually imply a relationship between the (natural logarithm) of level of income per capita at the beginning of the period analysed, and the rate of convergence towards the (natural logarithm) of the

steady state level of income per capita as captured by the set of variables postulated as growth determinants. In order to assess the degree to which the performance on AGEI is correlated with countries' growth performance in what follows a simple correlation between the growth determinants as summarised in that index and the level of agricultural value added per capita is discussed. There is no measurement of competitiveness separate from the index ranking that could serve correspondingly as a dependent variable by which to assess the degree to which the rankings are correlated with countries' competiveness.

Ideally a full panel dataset would be available to evaluate the relationship between performance on an index such as the preliminary AGEI and growth. This would consist of annual (or multiple-year average) scores on the enabling environment index and the respective levels of agricultural value added per capita over multiple years across the selected countries. Some conditioning variables considered to be a contextual or exogenous variable for the exercise would be utilised as well. Contemporaneous as well as lagged relationships between enabling environment index scores and growth could then be assessed, given the conditioning factors.

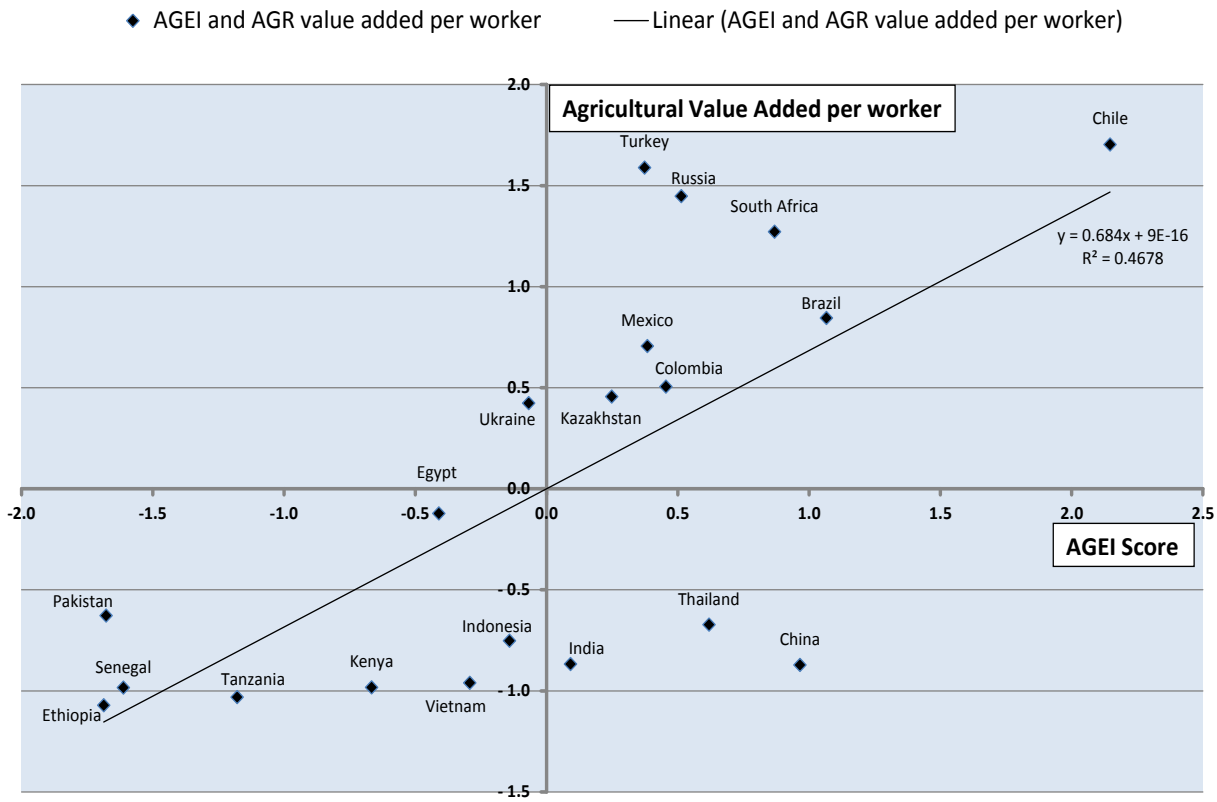
In absence of such a full panel of data, a very preliminary cross-tabulation picture of the relationship between the normalised AGEI, which is mostly measured for the period around 2010, and the similarly-normalised average level of agricultural value added per worker for the period 2000-12 (from the World Bank's World Development Indicators) is shown in Figure 11. The normalised AGEI scores are the horizontal elements of the cross-tabulation and the normalised levels of agricultural value added per worker are the vertical elements. Subject to several caveats, by this partial measure, a positive relationship is evident between the AGEI and the level of agricultural value added per worker.

The first caveat concerns causality. Even if a positive relationship appears evident in Figure 11, to argue that the factors measured by the AGEI have contributed to the different levels of agricultural value added per worker in the 2000s may miss other factors that may have contributed simultaneously to determine both the components of the AGEI and agricultural value added.

A second caveat concerns the variable utilised as the dependent ones in the equation. For instance, instead of using agricultural value added divided per agricultural worker, it could have been presented in per capita terms of total population or of rural population. Each representation may have its merits, but using the value per worker is a better indicator of agricultural productivity, and, arguably, of the possible competitiveness of the agricultural sector. In any case, the AGEI is clearly and positively correlated with those two other variables (not shown here). Also, instead of levels, growth rates of agricultural value added for the last decade can be utilised as dependent variables. The correlation of the AGEI with growth rates is also positive, but less strong, for the same set of countries (the correlation is not shown here).

Figure 11 and similar correlations provide, of course, only informal observations on the relationship of an index of the enabling environment for agricultural growth and competitiveness and the observed results of accumulated growth. More generally, it is important to recall the caveats regarding the selection of indicators, normalisation, aggregation, and the quality of some of the underlying data. Regarding these issues, a future index should be able to utilise a more extensive set of data on governance, institutions, and policies but in a way that retains the structure of growth determinants in Sala-i-Martin et al (2013) and takes the critical conditioning factors discussed in Section 2.2 of this report more fully into account.

Figure 11. AGEI and agricultural value added per worker (both normalised)



Source: Authors' tabulation.

5. Summary and conclusions

A positive enabling environment for agricultural growth and competitiveness is defined in this report to comprise a multifaceted setting for the agricultural sector and economy wide of non-distorting and stable policies, adequate provision of public goods, good governance through laws and regulations that are conducive to private-sector economic activity while addressing market failures, and strong and effective institutions through which GMAs are operationalised.

Three objectives are addressed in this context. The first is to provide a concise three-part review of the broad literature on determinants of economic growth and development, agricultural growth and competitiveness, and indices by which these determinants have been measured. The second objective is to propose a typology to identify components of the enabling environment for agricultural growth and competitiveness, describe the types of indicators that would be desirable for inclusion in an index by which to assess this enabling environment across countries, and to review the extent to which such indicators are available. The third objective is to construct an illustrative, preliminary index of the enabling environment for agricultural growth and development and apply this index to a selected set of countries in order to demonstrate the feasibility and potential utility of the indexing exercise.

A number of key points emerge from the literature review. First, economic growth and development theory and empirical studies suggest that both supply side and demand

side issues need to be considered. Second, although extensive lists of indicators related to GMAs and other factors affecting growth can be identified, and they may be used as check-lists of things to consider, invariably the main challenge is to analyse the specific constraints that a country faces and work to address them. Those constraints not only vary by country, but they evolve with time and changing circumstances.

With respect to agricultural growth and development, a third point highlighted in the literature is the crucial role of the rural nonfarm economy as the link between agricultural supply and demand. The contributions agriculture can make to general growth and the different stages of development have also been identified. The policy bias for or against the agricultural sector in terms of relative prices and subsidies, but also considering infrastructure and public services, and the overall circumstances of domestic demand, need to be taken into account.

Fourth, a recent literature quantifying the effects of agricultural and non-agricultural public investments on agricultural growth has evaluated, and to some extent ranked, the impacts of alternative types of expenditures. The empirical models that have evaluated the effects of public investments on agricultural growth have paid less attention to other GMA determinants of growth. Fifth, agricultural growth is an important component of pro-poor growth and of food security. Within this growth context, issues related to land tenure, the role of small farmers and rural labourers, and women empowerment must be carefully considered when designing government interventions.

Sixth, the state of the global economy will always be an important contextual factor. Seventh, the combination of factors that enable growth for the whole economy and the constraints and requirements posed by different types of agricultural conditions must be considered when analysing the enabling environment for agriculture. Conditional on agricultural resources and other considerations, and subject to a certain amount of policy discrepancy, there will generally be a substantial correspondence between the quality of the enabling environment for the economy overall and the quality of the enabling environment that a country is able to provide for agricultural growth and competitiveness.

In terms of empirical measurement through performance indicators, a wide range of measurements can be identified among GMA categories and within each category the indicators can be quite diverse and quite specific. The GCI is a well-known index of global competitiveness. The GFSI is a new index of global food security that includes a more substantial set of indicators related specifically to agriculture. There are also a number of related recent studies and on-going initiatives about agricultural growth and competitiveness, but these have not yet provided an index of the enabling environment among numerous countries. It remains a difficult task to figure out how the information categorised by these various indices and indicators can be turned into analysis of policy options to remove constraints to growth, as discussed in the general context of growth diagnostics.

The literature review has identified several challenges that are faced by efforts to construct indices of the determinants of growth or competitiveness. These challenges are: first, the choice of appropriate indicators for which such an index would be constructed; second the availability and the quality of data, or the cost of developing more adequate data, for those selected indicators; and third, the choice of appropriate normalisation, weights, and aggregation methods by which the various indicators would be translated into a comprehensive index.

Building on the literature review, a typology is proposed to link together two main dimensions of the enabling environment for agricultural growth and competitiveness: the categories of GMAs affecting the enabling environment and the effects of these measures across four different levels of the economy. The basic premise of this typology is that given the complexity of the issues involved it is constructive to disentangle the governance (public action) components of the enabling environment on one axis and the relevant components of the economy on the other.

Among components of the economy, a distinction is drawn between farmers and the general economy. In between the key linkages of agriculture to the nonfarm economy are distinguished between the rural/regional economy, which provide the geographical and local governance settings for food and agricultural production, and agricultural value chains, which are the market linkages for specific products between inputs, outputs and final demand, both domestic and international. Among GMAs affecting the enabling environment for agricultural growth and competitiveness, agricultural policies are supplemented by a range of determinants drawn from the literature review as relevant to growth and competitiveness and which would have impacts within and upon each of the four components into which the economy is differentiated.

Utilising this typology, existing indicators and indices are described that might serve as measurements of the specific GMAs as they affect the different components of the economy. Taking into account various caveats about construction of growth or competitiveness indicators, some of these cells are relatively well covered from available data and studies, particularly for the general economy and the agricultural sector at the farm level. In other cases, particularly for rural regions and agricultural value chins, there are greater deficiencies of available measurements across countries. This poses a limitation on constructing a preliminary index of the enabling environment consistent with the postulated typology of the determinants of growth and competitiveness.

Within these constraints, the indexing exercise is advanced by constructing a preliminary Agricultural Growth Enabling Index (AGEI) based on available indicators. The exercise is designed to show how an index for agriculture can be constructed to summarise a wide array of available information in a structured manner and then be used to provide across-country comparisons or single-country evaluations using either the index itself or its components. The construction of the preliminary AGEI is presented, it is applied to a selected set of 20 emerging and developing countries, and the performance of these countries on the index and its components are described. The preliminary results demonstrate that the AGEI brings together information relevant to the enabling environment for agricultural growth and competitiveness in a parsimonious manner largely consistent with more in-depth studies of the selected countries. This is essentially the limit of what an index can accomplish. Preliminary results show that, with caveats, the AGEI has a positive correlation with observed agricultural value added per worker, both in levels and in growth rates.

In conclusion, each aspect of this study has been exploratory and designed to contribute to the on-going research on agriculture's enabling environment. The contribution of the report lies in pushing through an exercise of developing a typology and constructing a preliminary index of the enabling environment for agricultural growth and competitiveness. While rudimentary in many respects, this is the first such exercise completed with this specific objective to the knowledge of the authors.

In the future, each component of this initial evaluation could undergo additional consideration. These components include: i) the literature review to identify relevant

growth and competitiveness determinants; ii) the literature review of existing relevant indicators of these determinants and of the recent and ongoing studies and initiatives to extend this database; iii) the elaboration of the conceptual typology for evaluating the enabling environment for agricultural growth and competitiveness; iv) the matching of indicators to this typology; v) the specification of an index characterising the enabling environment in each of its dimensions; vi) the set of countries to which such an index is applied; and vii) the ultimate verification that the specified index accomplishes its intended purpose by correlating with observed growth.

The overall purpose of this report has been to stimulate discussion of these many dimensions, and of the feasibility and efficacy of how they might be approached in further research and analysis. In short, from this demonstrative exercise, better indices can eventually be constructed, if so desired. Expansion and refinement of the included set of indicators will allow further depth of analysis on the determinants of providing a positive enabling environment to promote agricultural growth and competitiveness and to provide an important input into better policy decisions.

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Annex A.

Enabling environment for agricultural growth: Overview of initiatives

In addition to the Global Competitiveness Index (GCI) and the Global Food Security Index (GFCI) discussed in detail in the main body of the report, this Annex summarises seven other initiatives that are trying to identify, classify, and measure different government measures and actions (GMAs) related to agricultural growth and competitiveness. The seven initiatives are 1) OECD's Policy Framework for Investment in Agriculture (PFIA); 2) the joint OECD-FAO Monitoring African Food and Agricultural Policies (MAFAP); 3) World Bank's Doing Business in Agriculture (DBA); 4) World Bank's Agribusiness Indicators (ABI); 5) Growth-related indicators from IFPRI; 6) The measurements and indictors included in the OECD's PSE/GSE database; and 7) OECD's Product Market Regulations (PMR) methodologies.

A1. Policy Framework for Investment in Agriculture (PFIA)

The *Policy Framework for Investment in Agriculture* (PFIA) (OECD, 2013e) tries "to support countries in evaluating and designing policies to mobilise private investment in agriculture for steady economic growth and sustainable development." It draws on previous efforts by the OECD to develop a policy framework for investments in general. That previous effort was developed for about 60 OECD and non-OECD countries. The PFIA was first developed in 2010 mostly to apply in Sub-Saharan Africa, but it has also been used as a self-assessment tool in Asia (Indonesia and Myanmar). In principle, PFIA has a broad coverage for developing countries and can be utilised as part of the Comprehensive Africa Agriculture Development Programme (CAADP) of the New Partnership for Africa Development (NEPAD) and for the Grow Africa work, and as an instrument to facilitate initiatives such as the Global Donor Platform on Rural Development (GDPRD), the New Alliance for Food Security and Nutrition, and the US Feed the Future. The PFIA identifies ten policy areas, and provides check-list questions in each one of them, which can be mapped into specific categories of policies, investments, laws and regulations, institution and market determinants of agriculture's enabling environment. A brief summary of the ten areas and examples of issues within each one is presented in Box 1.

Box 1. PFIA classification of policy areas

1. **Investment policy**
   Accessibility, transparency, and predictability of laws, regulations, and policies; quality of regulations; FDI regime; land and water tenure rights; contract enforcement, dispute settlement, and compensation.
2. **Investment promotion and facilitation**
   Institutions and measures for promoting investment in agriculture; government intervention in input and output markets; mechanisms for investor-government dialogue.
3. **Infrastructure development**
   Coherent infrastructure, rural development and agricultural policies; clear responsibilities for project design, funding, maintenance; participation of private sector in infrastructure; strategy and investments in irrigation, transportation, electricity, and information and communication technologies.
4. **Trade policy**
   Barriers within (across) the country; customs and administrative procedures for cross-border trade; trade policies related to agricultural inputs and equipment; export promotion and export restrictions; multilateral, regional, and bilateral trade agreements.
5. **Financial sector development**
   Regulatory framework, collateral requirements, cadastre system, movable assets, credit information system for agricultural finance; banking sector competition and financial products offered; leasing; role of informal financial system, including microfinance; governmental measures to facilitate credit; role and operation of capital markets.
6. **Human resources, research and innovation**
   Education system, public extension services, vocational training, an business development services; public R&D; linkages with private sector to generate and transfer knowledge and technology; protection of IPR; biotechnology policy.
7. **Tax policy**
   Alignment with agricultural investment objective; neutrality (foreign/domestic, large/small); tax incentives; transparent and efficient tax policy and administration; co-ordination of central and local tax administration and funding of local public goods.
8. **Risk management**
   Insurance products; competition in the insurance market; forward contracts, futures markets; co-operative arrangements for collective risk management strategies; diversification in production, practices, marketing and income sources.
9. **Responsible business conduct**
   Labour standards in agriculture, right to food, tenure rights, health, anti-corruption and integrity; consultation and protection of rights of communities in large agricultural investments affecting them; communication and enforcement of RBC.
10. **Sustainable use of natural resources and environmental management**
    Policies for natural resource management and cleaner technologies, integration of R&D and environmental policies, energy needs and mitigation of extreme weather; whether existing environmental policies, laws and regulations ensure sustainable use of natural resources, considering the specificities of the agricultural sector; institutions and enforcement of environmental policies, laws and regulations; access to, and adoption of, clean and low-input technologies.

Source: OECD, 2013e.

A2. Monitoring African Food and Agricultural Policies (MAFAP)

FAO and OECD are jointly working on the Monitoring African Food and Agricultural Policies (MAFAP) project (see MAFAP website: www.fao.org/mafap/mafap-home/en). The objective is to support decision-making at national, regional and pan-African levels, contributing to the NEPAD's CAADP. The project will prepare a flagship report on *Monitoring African Food and Agricultural Policies* focused on ten countries (more intensive analysis is taking place in Burkina Faso, Mali, Kenya, Tanzania, and Uganda, while in Ethiopia, Ghana, Malawi, Mozambique and Nigeria the work is in a more preparatory stage).

The methodological papers (FAO, no date and FAO, 2011) indicate that it looks at two main categories of interventions in the agricultural sector: i) policy measures affecting incentives and disincentives (evaluating the impact of policy interventions in food and agricultural markets based on price gaps in major commodity chains and input markets); and ii) measures of government expenditures in support of agricultural development (trying to develop disaggregated budgetary accounts).

Among the first group of policy measures, MAFAP distinguishes those governing the economy as a whole (macroeconomic policy) and those for a particular economic sector (sector policies). It also distinguishes between three types of interventions: legal and regulatory frameworks; institutional reform; and provision of incentives or disincentives via price and trade policies, input and output marketing policies, social policies (income transfers, safety nets, social security schemes) and finance policies.

Among the second group (public expenditures), MAFAP considers those utilised to supply goods and services to the food and agriculture sector in support of the implementation of government policies and to facilitate achievement of development objectives. These expenditures may generate public goods (i.e. public investments in infrastructure), or confer private benefits (i.e. subsidies or income transfers). The objective of the project is to develop quantitative indicators for the incentives/disincentives part of the policy block, and for public expenditures.

The incentives and disincentives facing agents in the food and agricultural sector may be affected explicitly by government policies (i.e. market interventions, such as guaranteed prices) or "implicitly by the level of costs incurred in getting goods to markets, and by monopolistic (or monopsonistic) practices along the value chain." The project wants to quantify those incentives and disincentives, and "who benefits and who loses from current policies and market structures." The expected results may be a) policy reforms in e.g. trade policies and exchange rates; b) public investments to reduce costs, and/or c) structural reforms and competition policies to ensure competitive markets.

MAFAP discusses a series of policies without necessarily classifying them; the organising principle is the identification of different components of the price received by the farmer (or paid by the final consumer), and examples of policies are given in that context. For instance, if Pf is the price received by the farmer, then this is the result of adjusting the FOB price in foreign currency (assuming an exportable) by the exchange rate, costs related to transportation, processing and marketing, costs due to non-competitive markets (including possibly procurement policies by public sector firms), costs related to rules and regulations (from SPS to customs procedures). Prices can be calculated at different levels in a value chain, and the price gaps, price pass-through and the relative incentives and disincentives in the whole chain can be evaluated. Similar analysis is undertaken for four Asian countries in Orden et al. (2007).

MAFAP also mentions the need to look at input markets (and factor markets) to estimate not just prices, but value added, in order to calculate the effective rate of protection (i.e. the ratio of value added calculated at domestic prices to value added at border prices). MAFAP notes as well that the analysis of incentives/disincentives has to be done considering inter-sectoral distortions, i.e. how agricultural incentives compare to incentives provided to non-agricultural sectors. From that quantification "it should be possible for policymakers to identify where the distortions in the system are greatest and where the most important priority areas are, be they in the area of commodity policies, macro policies, structural policies or regulatory reforms."

The section of public expenditures starts with the OECD approach to calculate PSEs and GSSEs (see below the components of these indicators) but then expands the coverage, distinguishing three broad levels of expenditures: agriculture-specific; supportive to agriculture but not specific to agriculture; and, those that are unrelated to the agricultural sector. Within the agriculture-specific category, MAFAP separates a) support to producers, b) support to other agents in the value chain (input suppliers, processors, consumers, traders, transporters), and c) general sector support. The categories follow OECD's principle of classifying policies according their economic characteristics, as shown in Box 2.

MAFAP considers that with this information it will be possible to determine the alignment of public expenditures with stated policy priorities, investment needs, and existing system of incentives. As MAFAP focuses on Africa, data on public expenditures should also link foreign aid with national expenditures and priorities.

Besides the two blocks mentioned (policy measures affecting incentives and measures of government expenditures in support of agricultural development), the MAFAP methodology also considers a third group of general indicators of development and performance, drawn from secondary sources, that show the progress and challenges related to the attainment of key issues in the food and agricultural sector: poverty, inequality, food security, health & human development, and the environment and natural resources. While the first two blocks focus on quantifying contributing causes of growth, the third highlight its effects (see FAO, 2011 Monitoring African Food and Agricultural Policies [MAFAP] www.fao.org/fileadmin/templates/mafap/documents/MAFAP_Flyer_January2011_EN.pdf).

Box 2. MAFAP proposed classification of public expenditures

1. Agriculture-specific policies

1.1. Payments to the agents in the agro-food sector

A. Payments to producers

Production subsidies and payments to farmers via development projects Input subsidies: variable inputs (seeds, fertiliser, energy, credit, other); capital (machinery and equipment, on-farm irrigation, other basic on-farm infrastructure); on-farm services (pest and disease control/veterinary services, on-farm training, technical assistance, extension etc., other)

Income support

Other

B. Payments to consumers (food aid, cash transfers, school feeding programmes, other)

C. Payments to input suppliers

D. Payments to processors

E. Payments to traders

F. Payments to transporters

1.2. General sector support

Agricultural research

Technical assistance

Training

Extension/technology transfer

Inspection (veterinary/plant)

Infrastructure (roads, non-farm irrigation infrastructure)

Storage/public stockholding

Marketing

Other

2. Agriculture supportive policies

Rural education

Rural health

Rural infrastructure (roads, water, other)

Source: FAO, no date.

A3. Doing Business in Agriculture (DBA)

Doing Business in Agriculture (DBA) and Agribusiness Indicators (ABI, summarised in the following section) are two separate initiatives within the World Bank (WB) that seem to be converging. They are supposed to be producing material together from 2013 onwards.

DBA is an application of the general Doing Business (DB) project developed by the World Bank and International Finance Corporation. DB uses 10 broad indicators (and up to 41 sub-indicators) to capture the general business conditions and investment climate for urban-based enterprises in 185 countries. DBA objective is to develop a set of indicators of the laws and regulations affecting agricultural business in countries around the world. It starts from the general methodology applied by the DB project but, considering that the latter focuses in urban enterprises, DBA modifies and expands the DB's approach focusing on legal and regulatory issues directly relevant for smallholder farmers and general agricultural productivity (World Bank [a], no date). The objective is to highlight areas where regulatory reform can have positive impacts on the investment climate for agriculture, helping improve smallholder productivity, agribusiness development, and rural standards of living.

DBA applies the two types of indicators used by DB:

- Legal indicators. They measure the laws and regulations on the books as approved.
- Time and motion indicators. They measure, from the point of view of a firm or economic agent, the time, procedures, and cost required to complete a transaction in accordance with all relevant regulations.

A preliminary list of the seven indicator areas proposed by DBA is shown in Box 3. The specific indicator areas will focus on the key interactions between the government and the private sector at the various stages of the agribusiness value chain. This list is considered illustrative and preliminary: the final selection of topics and specific indicators is expected to require further research, piloting, and consultation with experts.

The DBA concept note outlines an implementation process that includes a) additional research and consultation work (internal and external to the WB) to refine the specific DBA indicators; b) a pilot application of the surveys and indicators developed, using a couple of contributors per topic, in one or two countries per region; c) identify the countries (approximately 80 countries) to be included in the first round of the DBA project, focusing on countries where agriculture represents a significant component of economic activity (e.g. at least 10% of GDP) and diversifying across regions and income levels to ensure a variety of agricultural regulatory regimes; d) develop a database of local experts in each country that are qualified to respond to surveys on the various DBA topics (such as law and accounting firms that provide services to the agribusiness sector, government regulators working in agriculture, organisations representing smallholder farmers, and private agribusiness firms); e) establish partnerships with global firms working in agricultural regulatory areas. The DBA concept note indicates that the work would be ready to produce results around 2015-16, producing a new report every two years after that.

Box 3. DBA list of indicators

1. Exporting agricultural products (legal and regulatory regime to export agricultural products)
- What export pricing policies are in place (such as export taxes, subsidies, price controls, quotas)?
- What export approvals or other restrictions exist (including by law, and in practice)?
- What licensing requirements exist to export agricultural products?
- How easy is it to comply with sanitary/phytosanitary (SPS) approval or pesticide compliance requirements?
- What proportion of exported containers of agricultural products is inspected?
- What are the time and procedures associated with clearing all export requirements for an agricultural good?

2. Accessing agricultural inputs (legal and regulatory regime to access inputs for agricultural production, both imports and domestic sale and distribution)
- Procedural requirements to import inputs (including by law, and in practice)
- Are licenses required to import inputs? Are approvals required?
- What are the time and procedures associated with importing agricultural inputs?
- Procedural requirements to distribute inputs (including by law, and in practice)
- Are licenses required to distribute/sell agricultural inputs?
- What type of documentation is necessary to receive such a license?
- What are the time and procedures associated with obtaining an input distribution license?
- Taxes/subsidies on agricultural inputs; Tractor import taxation/subsidisation; Fertiliser import taxation/subsidisation; Seed import taxation/subsidisation

3. Getting credit for agribusiness (access to credit by smallholders and agribusinesses for agricultural production and trade)
- Leasing agricultural equipment (is there a law, what procedural steps are required, etc.)
- Are there regulations that enable or inhibit the use of moveable collateral?
- Existence of a warehouse receipt system, and associated enabling/inhibiting laws and regulations
- Can export contracts be used as collateral for financing?
- Are there restrictions on the method of valuing agricultural land to be used as collateral?
- What kinds of insurance are farmers able to access?

4. Accessing agricultural land/property (legal and regulatory issues related to purchasing or leasing land for agricultural production)
- Registering property: time and procedures required to purchase agricultural land and transfer the property title.
- Securing land/resolving land disputes: time and procedures required to settle a dispute through judicial system.
- Leasing land: time and procedures required to lease rural land for agricultural production.
- Security of access to land: measure of the security of a farmer's title to land through i) the level of protection offered by land registries to registered owners, ii) whether land boundaries are clear, and iii) whether there is compensation in the event of expropriation.

5. Accessing water (legal and regulatory issues affecting access to water, including water pricing policies or distributional regulations)

6. Storing, handling, and transporting agribusiness products (regulatory issues affecting the availability and efficiency of storage and transport services for the agricultural sector).
- What procedures or licenses are required to commercially store agricultural products?
- How efficient are inspection requirements of storage and treatment facilities?
- Do regulations improve or inhibit ease of entry into the trucking sector? How are they implemented?

7. Contract farming (legal and regulatory framework affecting contract farming, which allows small farmers participate in the agricultural value chain)
- Are there co-operatives of smallholders that assume the responsibility of distributing the necessary inputs and facilitating the provision of extension services?
- Do dispute resolution and enforcement mechanisms exist?
- Are they handled by local magistrates or through national courts?
- How complex and costly are the dispute resolution and enforcement mechanisms that exist?

Source: World Bank (a), no date.

A4. Agribusiness Indicators (ABI)

A related activity at the WB is the Agribusiness Indicators project (ABI) carried out by the Agriculture and Rural Development Department. The project focuses on success factors that can help agribusiness in SSA countries and has developed a set of indicators for cross-country comparisons. The project is undertaking pilot studies in Burkina Faso, Ethiopia, Ghana, Mozambique, Kenya, Tanzania and Zambia. The project is funded by the Gates Foundation. It uses a different approach than DB/DBA, but several of the issues identified overlap. Different from the DB methodology, the ABI approach looks at a broad spectrum of actors along the value chains for key agricultural commodities (World Bank [b], no date).

The ABI project has identified indicators in three areas that directly impact agricultural productivity and competitiveness: 1) Access to critical factors of production, including certified seed, inorganic fertiliser, and mechanical inputs; 2) Supporting services measures, including finance and transportation government policies; and 3) Policy and institutional measures and the enabling and regulatory environment including fiscal, monetary policies and trade policies, the private sector perception of enabling environment particularly as regards to government crowding out of the private sector, the role and influence of civil society and advocacy groups, and the existence of roundtables on issues affecting stakeholders in the agribusiness sector. The ABI project document (World Bank [b], no date) notes that the set of success factors and indicators identified may not be exhaustive, but tries to focus on the most "critical factors" for the countries studied.

The studies conducted (including the quantification of the indicators) are based on discussions with key informants from the private and public sectors, and from academia and NGOs, involved in the production, processing, and marketing of key agricultural commodities in the country, and on secondary data. The results can be used to compare the profiles and performances across the countries covered. Those results and findings are disseminated to key stakeholders (public sector, private sector, civil society) in the country studied to make them aware of the findings, receive comments, and help with the policy dialogue and the design and implementation of eventual policy reforms needed.

A5. Growth-related indicators from IFPRI

A primary focus of IFPRI research addresses the enabling environment for agriculture growth. While we will not review the broad range of specific relevant studies, four indicator series available from IFPRI are germane along lines of the classification initiatives discussed herein. These series (see IFPRI, 2013) are 1) Total and Partial Factor Productivity, 2) Agricultural Science and Technology Indicators, 3) Statistics of Public Expenditures for Economic Development and 4) Food Policy Research Capacity Indicators.

The Total and Partial Factor Productivity indices are based on FAO output and input data and calculated using statistical aggregation and smoothing techniques. Total factor productivity (TFP) measures the ratio of total output (crop and livestock products) to total production factors or inputs (land, labour, capital, and materials), while partial factor productivity (PFP) measure the ratio of total output to a specific production factor or input (such as labour or land). The TFP estimates are obtained using data envelop analysis techniques and are available from 1980 to 2009. The output indices suggest that growth rates of agricultural output slowed down after 2000 compared to earlier years

among high-income countries, dropped sharply during the 1990s but have subsequently increased among transition countries, and since 2000 have generally maintained or bested their long-term averages among developing countries.

The calculated TFP indices suggest productivity growth has been highest over four decades (1971-2009) among high-income countries (averaging 1.36% per year), but since 2000 has been higher among the transition and developing countries (except South Asia and SSA), with a world average since 2000 of 1.22% compared to 0.65% for the longer period 1971-2009 (Fuglie and Nin-Pratt, 2013). Other studies, while observing similar shifts among regions, are more conservative about the relative levels of recent rates of TFP growth. Pardey, Alston and Kang (2012) point out that TFP estimates "are unavoidably subject to distortions whose magnitude and direction are difficult to decipher" due to "the incomplete and inaccurate data (and the methods) used to construct them." On the basis of their analysis, they express concern that the recent era (since 1990) may be one of "slower and perhaps still slowing agricultural productivity growth."

The remaining three IFPRI indices measure potential determinants of agricultural growth; respectively, the levels of resources (expenditures, research labour force) devoted to development of agricultural science and technology, public expenditures on the agricultural sector and the non-agricultural economy, and capacity specifically for agricultural policy research.

A6. OECD PSE/GSSEs

The OECD has developed indicators that monitor and evaluate the level and composition of support provided to agriculture. They are divided into Producer Support Estimates (PSE) and General Services Support Estimates (GSSE). Categories of these measures are shown in the Box 4.

Box 4. OECD PSE and GSSE Measures

PSE Categories

A. Support based on commodity output:
   A.1. Market price support (MPS): transfers from consumers and taxpayers to agricultural producers arising from policy measures that create a gap between domestic market prices and border prices of a specific agricultural commodity, measured at the farm gate level.
   A.2. Payments based on output: transfers from taxpayers to agricultural producers from policy measures based on current output of a specific agricultural commodity.

B. Payments based on input use: transfers from taxpayers to agricultural producers arising from policy measures based on on-farm use of inputs:
   B.1. Variable input use
   B.2. Fixed capital formation
   B.3. On-farm services

C. Payments based on current A/An/R/I, production required: transfers from taxpayers to agricultural producers arising from policy measures based on current area (A), animal numbers (An), receipts (R) or income (I), and requiring production.

D. Payments based on non-current A/An/R/I, production required: transfers from taxpayers to agricultural producers arising from policy measures based on non-current (i.e. historical or fixed) area, animal numbers, receipts or income, with current production of any commodity required.

E. Payments based on non-current A/An/R/I, production not required: transfers from taxpayers to agricultural producers arising from policy measures based on non-current (i.e. historical or fixed) area, animal numbers, receipts or income, with current production of any commodity not required but optional.

F. Payments based on non-commodity criteria: transfers from taxpayers to agricultural producers arising from policy measures based on:
   F.1. Long-term resource retirement
   F.2. A specific non-commodity output
   F.3. Other non-commodity criteria

G. Miscellaneous payments: transfers from taxpayers to farmers for which there is insufficient information to allocate them among the appropriate categories.

GSSE Categories

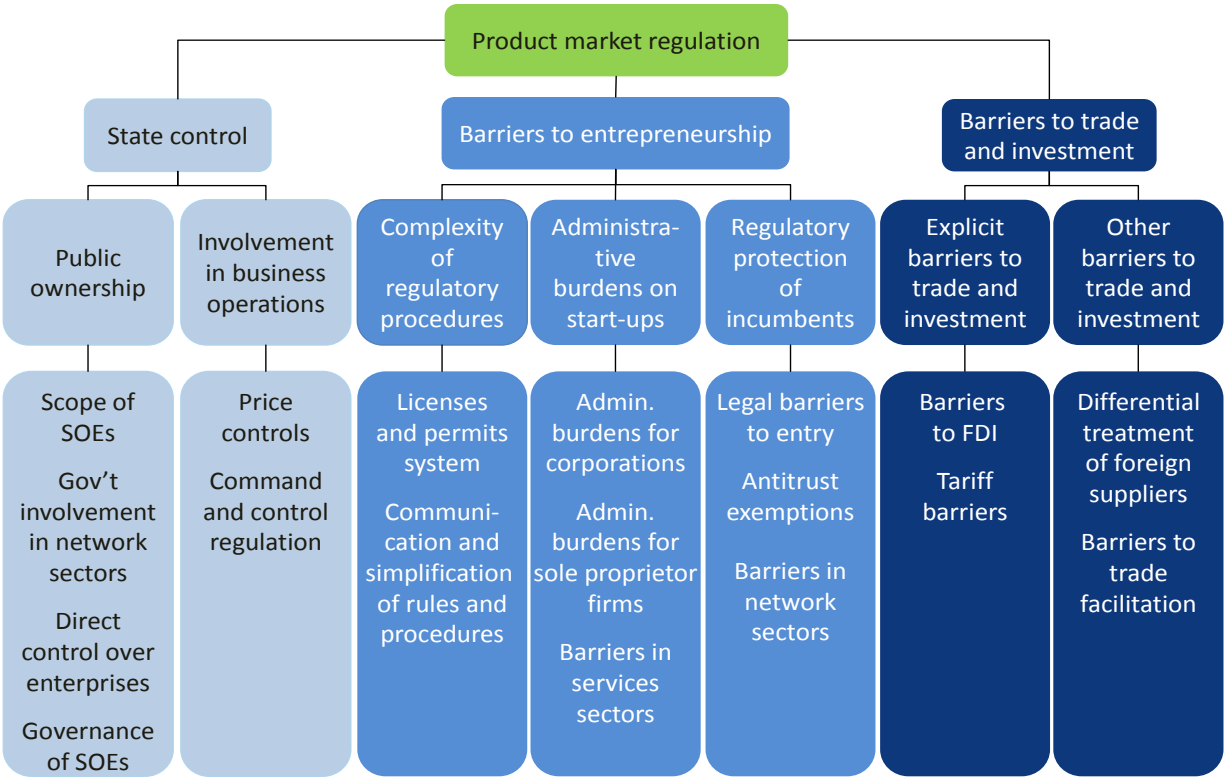
H. Agricultural knowledge and innovation system: Budgetary expenditure to support:
   H.1. Agricultural knowledge generation
   H.2. Agricultural knowledge transfer
J. Inspection and control: Budgetary expenditure to support:
   J.1. Agricultural product safety and inspection
   J.2. Pest and disease inspection and control
   J.3. Input control
K. Development and maintenance of infrastructure. Budgetary expenditure to support:
   K.1. Hydrological infrastructure
   K.2. Storage, marketing and other physical infrastructure
   K.3. Institutional infrastructure
   K.4. Farm restructuring
L. Marketing and promotion. Budgetary expenditure to support:
   L.1. Collective schemes for processing and marketing
   L.2. Promotion of agricultural products
M. Cost of public stockholding: Budgetary expenditure covering the costs of storage, depreciation and disposal of public storage of agricultural products.
N. Miscellaneous: Budgetary expenditure financing other general services that cannot be disaggregated and allocated to the above categories.

Source: OECD (www.oecd.org/tad/agricultural-policies/psemanual.htm).

A7. OECD PMRs

The indicators of OECD's Product Market Regulation (PMR) try to measure the degree to which policies promote or inhibit competition at the economy-wide level and in specific product markets where competition is viable. The latest set of indicators (2013) is intended to cover 34 OECD countries and 22 non-OECD countries. Annex Figure 1 shows the structure of the components of the economy-wide PMR Indicator.

Annex Figure 1. The structure of the OECD's economy-wide PMR Indicator



Source: OECD (www.oecd.org/eco/reform/indicatorsofproductmarketregulationhomepage.htm).

Besides the economy-wide indicator, the OECD calculates indicators of sectoral regulation, including for seven network sectors (electricity, gas, rail transport, air transport, road transport, post and telecom) and two services sectors (professional services and retail trade). The indicators on the electricity, gas, post and telecom sectors also include information on market structure, which is not part of the PMR indicators since the latter focus solely on policy settings.