

Chapter 2: Guidelines for Conducting a Constraints Analysis

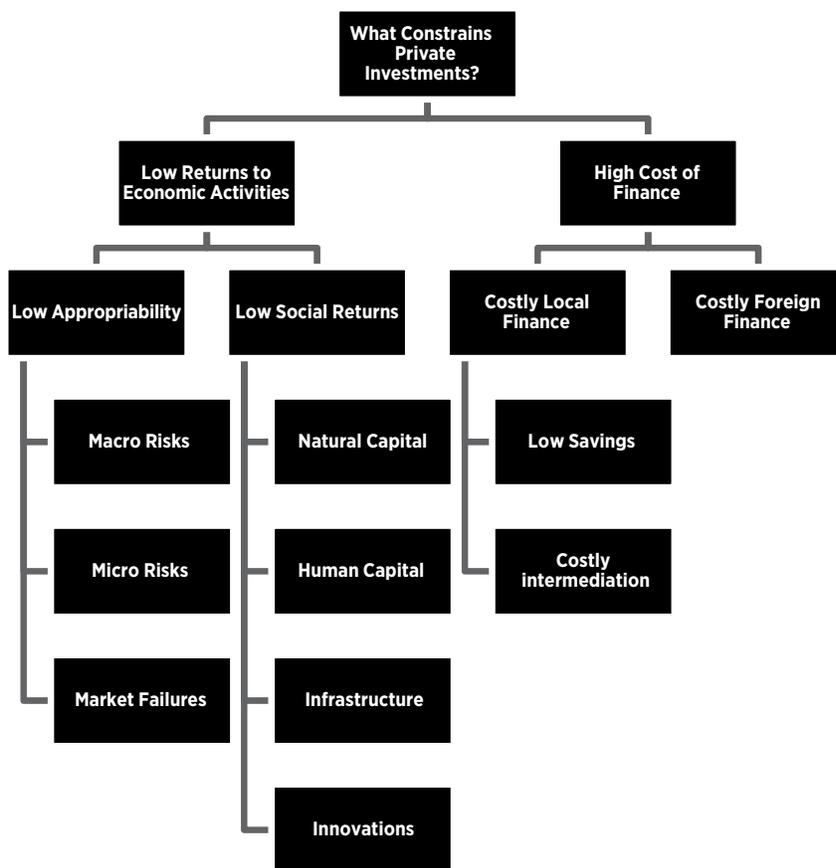
The purpose of the Constraints Analysis (CA) is to identify the binding constraints to economic growth, which are the most severe root causes that deter households and firms from making investments of their financial resources, time, and effort that would significantly increase incomes. The results of the CA are not intended to dictate specific projects to be funded by the MCC, but rather to provide a framework that will help focus the consultative process on appropriate programs that will ease those constraints and stimulate economic growth. A successful CA will constitute a solid foundation for the expeditious development of a compact that addresses country priorities and is consistent with MCC’s quality standards.

This document provides methodological guidance on executing a CA. Successfully undertaking a CA involves posing and answering a sequence of diagnostic questions that highlight the “root causes” that constrain investment. Figure 1 below presents a hierarchical framework or “tree” to organize and motivate the questions driving the CA. Answering those questions involves: (1) selecting and formulating the diagnostic questions in a sensible way for the country at hand; (2) researching and marshaling key evidence and data that shed light on the questions; and (3) answering the questions based on the balance of such evidence.

Figure 1: Constraints Analysis diagnostic tree¹

The CA builds on the premise that private investment, both domestic and foreign, represents the primary engine of economic growth. Countries seeking to accelerate growth, then, are faced with the fundamental question that lies at the center of the CA exercise: “What constrains private investments?”

The boxes in the second row of the figure suggest two distinct alternative answers to this question: “Low returns to economic activities” and “High cost of finance.” If evidence suggests the latter is true (i.e., the cost of capital is high), the tree presents a series of issues that need to be considered to understand the systemic explanations. This approach helps keep the focus on problem identification and prevents the premature leap to possible solutions (e.g., subsidized credit) that would not address the underlying causes of expensive capital. If evidence shows that the cost of capital is not out of line with international norms, then the CA tree examines whether low returns to economic activities explains the current levels of private investment. In general, using the hierarchy of Figure 1 as a guide, we consider in turn the questions suggested there, working our way down the tree to determine which of the possible explanations are most responsible for low investment and, in turn, low growth rates.



¹ Adapted from Figure 1 of Hausmann, Rodrik, and Velasco (2005), “Growth Diagnostics.”

The constraints identified in the CA should be **fundamental causes** rather than **symptoms**. For example, discussions regarding the lack of dynamism within the domestic private sector may lead to the designation of “*inadequate access to finance*” as the problem, but stop short of identifying the root causes of a financial system unable to deliver private capital efficiently and effectively; possible root causes might include policies that limit or distort competition in the banking sector, weak capacity of banks to readily identify potential creditworthy borrowers, an unusually poor institutional environment for enforcing loan terms (e.g., difficult or costly seizure of collateral, lack of credit reporting) low domestic savings rates, macroeconomic conditions that raise the domestic cost of capital and limit the number of profitable lending opportunities, or other factors.

Alternatively, one may have evidence of *low agricultural productivity*, but this is not a binding constraint itself. The constraint could be, rather, low levels of human capital or knowledge concerning agricultural technologies or practices, poorly-defined property rights suppressing investment in the land, distortionary agricultural or trade policies, lack of transport infrastructure, high levels of soil erosion, among other underlying causes.² Sometimes the lack of sufficient water is identified as a constraint to agricultural productivity. This condition, like others in the natural capital area, is difficult to alleviate cost-effectively, since doing so may exacerbate an underlying problem of poor management of forests and watersheds. However, improved water management and more efficient allocation of scarce water resources may allow a country to grow much faster if faced with such binding constraints. Allocating water more efficiently may require irrigation or urban water infrastructure, depending upon the returns to various uses of water.

Gender inequalities may be a further underlying constraint, where women, for example, may perform a high proportion of labor throughout the agricultural value chain, but have systematically lower levels of health, education, and access to inputs, credit, and training, reducing their productivity. At the same time, rather than identify an economic and social *outcome* such as this as a binding constraint to economic growth, the analysis should examine the *underlying reasons* for under-investment in women and the lack of participation by men in the agricultural labor force. If it is due primarily to gender discrimination, economic costs are high, and growth in the economy depends upon labor productivity in agriculture, this root-cause obstacle may represent a binding constraint to economic growth. As in this example, each such candidate explanation must be tested empirically, weighed against other causes of slow growth, and shown to be among the most binding constraints to economic growth.

The CA should strive to identify, characterize quantitatively, and prioritize these more fundamental constraints. In practice, the CA should identify a fairly small number of core impediments to growth.³ It is important that this analysis does not simply produce an exhaustive list of all possible economic concerns, but rather identifies those that represent the most binding constraints to growth.

Conducting a Constraints Analysis

Unless otherwise approved in writing by MCC’s Vice President for Policy and Evaluation, the CA shall be completed within three months of a country’s selection as eligible by MCC’s Board. Consistent with country leadership and commitment of compact development, eligible countries are responsible for identifying the binding constraints to economic growth. To make this commitment operational, MCC expects that core teams will be staffed with an economist as early as is practical who will serve as CA team leader (see section below on “Identification of the CA Team”). The economist should be able to draw on additional resources for assistance with research and data analysis, and have familiarity with and access to key sources of economic data and statistics within the eligible country. While MCC emphasizes country leadership and hence ownership of the CA process and findings, the analysis can be co-authored by MCC economists or consultants engaged by the country or by MCC.

² In analyzing the extent to which soil erosion constituted a constraint to increased incomes, for example, one would need to account for externalities with respect to both costs (e.g., increased siltation adversely affecting water quality) and benefits (e.g., the potential for reduced erosion to enhance ecosystem services and thereby increase incomes).

³ While the number of core impediments to growth will vary by country, the CA exercise described here should be recognized as an effort to heighten the focus on the *most critical* barriers to investment, and economic growth. Recognizing the need for country-specific judgments, the MCC suggests that the CA report focus on the 2–4 most important binding constraints.

Naturally, to avoid wasting resources and duplicating effort, MCC urges countries to make full use of existing analyses of growth constraints that are of sufficient quality.⁴ MCC economists can provide input and guidance on the adequacy of existing analytical work to fulfill in whole or in part the CA requirement.

To facilitate the timely production of a quality CA, MCC will do the following:

1. *Undertake two quick “stock-taking” exercises* to inform a work plan and level of effort for a CA (including updating/augmenting an existing CA):
 - a. The first would assess content and quality of any existing studies on growth constraints with respect to fundamental criteria such as use of evidence, rigor of argumentation, and extent of / basis for prioritization of constraints. MCC wishes to make full use of existing analyses that meet a sufficiently high quality standard with respect to the reliability of findings. Where existing studies are not sufficiently rigorous, complete or focused on MCC’s mission of reducing poverty through growth, these may at least constitute points of departure for further analysis that refines and builds upon the existing work. If an existing study suffices, MCC and the eligible country could choose to accept and endorse such study as a CA.
 - b. The second would catalog—and, for the most important sources, conduct quick “reconnaissance” of—existing economic and sector work (ESW) likely to be most useful and influential for conduct of the CA. This could take the form of comparing the questions raised by the CA diagnostic “tree” (see Figure 1 above) with the content of available ESW, and noting any apparent gaps.
2. *Bring to bear MCC’s experience with CAs* to engage early on with compact-eligible countries in the analysis. The aim is twofold: (i) to help ensure greater quality and relevance of the final product, as well as (ii) to strengthen the links of the analysis to a deeper, sector-specific examination of causes and issues. This will entail providing methodological and empirical guidance on the CA, drawing from a technical guidance package customized for the compact-eligible country (e.g., with country-specific benchmarking), and made available in conjunction with individualized coaching, particularly on methodological issues. This support would include systematic catalogs of diagnostic questions to consider, sources to consult, and cross-country and national data sets.

Methodology

The CA should include a short narrative account of the country’s historical economic growth and trends in key indicators of productivity and investment, such as the private investment-to-GDP ratio, featuring both growth episodes and periods of relative stagnation, and a timeline of key economic events plausibly bearing on that history of growth.⁵ The aims of this narrative are, (1) based on the historical record to understand and highlight the factors likely to be associated with changes in the country’s economic growth rate, and thereby (2) to set the factual stage for the application of Figure 1’s diagnostic tree above.

Conducting the analysis for the CA entails moving through the tree in Figure 1 by applying principles of “differential diagnosis” such as those articulated in Ricardo Hausmann’s “Mindbook.”⁶ These principles are based upon the notion that a ‘low’ amount of a factor in an economy could be due to demand side or supply side constraints, and one is trying to identify those factors for which the supply is severely curtailed relative to demand, and for which the cost to the economy is highest. Ways to test whether a constraint to growth is binding are therefore:

⁴ Key quality considerations include focus on growth, comprehensiveness in scope, specificity and quality of data and evidence, rigor of methodological approach, and the persuasiveness of the conclusions—in particular, the prioritization/quantification of constraints—based on the analysis.

⁵ Dani Rodrik’s 2003 edited volume, *In Search of Prosperity: Analytic Narratives on Economic Growth* (Princeton University Press), contains a series of such narrative accounts of growth that can serve as useful illustrations, though these essays contain far more extensive and detailed accounts than a CA would require.

⁶ Ricardo Hausmann, Bailey Klinger, Rodrigo Wagner (2008) “Doing Growth Diagnostics in Practice: A ‘Mindbook’” (Harvard University Center for International Development (CID) Working Paper No. 177), available [here](#).

1. The (shadow) price of the constraint should be high

This principle is easiest to apply when market prices for the constrained resources are readily available. Common examples would include high lending interest rates as an indicator of an important constraint on finance, or high market wages indicating scarcity of certain types of workers or skills.

2. Movements in the constraint should produce significant movements in the objective function

Illustrations of this principle could include investment volumes that track closely remittance inflows, or labor productivity that varies in accordance with key indicators of workers' health outcomes.

3. Agents in the economy should be attempting to overcome or bypass the constraint

An important example of this principle would be a large informal sector as an indicator of microeconomic obstacles to business activity (e.g., "red tape"). Another, more sector-specific example could be a significant fraction of enterprises purchasing diesel generators in the face of unreliable or expensive grid-based electricity supplies.

4. Agents less intensive in that constraint should be more likely to survive and thrive, and vice versa

One illustration of this principle would be underdevelopment of labor-intensive sectors compared to capital intensive ones (compared to similarly-situated countries), which may suggest significant labor market frictions. Another example would be to examine the relationship between sectoral performance and level of dependence on external finance to assess whether finance is likely a binding constraint to growth.

Hausmann, Klinger, and Wagner (2008) also contains further discussion and examples applying these principles of differential diagnosis in the context of a CA.

Benchmarking the country in question against similarly-situated comparison countries is part and parcel of applying these methods, as an assessment of whether an indicator is 'high' or 'low' is often needed, and therefore some relevant benchmarks are needed. By assessing the country of interest against plausible comparator countries (e.g., countries having similar levels of income per capita, geographic, historical, or other contextual factors, or countries in the same region), we may identify constraints to growth causing the country to lag behind its potential growth path.

Useful Evidence and Data

The principles and techniques above suggest specific tests and diagnostic questions for the various branches of the tree in Figure 1, requiring a range of data and information. The evidence and data brought to bear on these questions should be drawn from diverse sources that may highlight any systemic bottlenecks to investment. Broadly speaking, the CA requires information on levels, trends, and cross-country comparisons with respect to a variety of variables and parameters, on both the micro- and macroeconomic levels, as well as qualitative evidence indicating the presence of constraints. As noted, maximum use should be made of existing relevant analyses of constraints to growth and readily-available data sources to expedite the process. Specific examples of useful data are listed as follows:

Macroeconomic variables:

- ★ Investment (public and private)
- ★ Factor prices (wage levels, interest rates)
- ★ Savings (domestic and foreign)
- ★ Inflation
- ★ Fiscal balance and public debt
- ★ Export performance and trends

- ★ Current account
- ★ Measures of natural capital, including natural resource stocks

Microeconomic factors:

- ★ Levels of educational attainment, returns to education or skill, employment levels, literacy levels
- ★ Health of the labor force, business costs of illness
- ★ Borrowing and lending flows
- ★ Quality of economic and political governance (especially “cost of doing business”)
- ★ Quantity and quality of infrastructure, demand for this infrastructure (e.g., traffic levels on roads)
- ★ Gender inequalities in access to assets (human, physical, natural, and financial capital)

Analysis supporting the CA should consider the reliability of the data and differences in the nature of indicators used in the CA. Metrics of quantity or usage levels, for example, convey less information than do prices: The observation that there are relatively few investment loans in a country, for example, may give the impression that there is a constraint in the capital market, but if interest rates are also observed to be low, then access to capital is much less likely to be a constraint. Similarly some data sources may be inherently biased: analysts should be aware that enterprise survey data represent a selected sample of firms—only those able to survive in the country’s economic environment show up in the survey, making identifying binding constraints from respondents problematic. Some surveys may only include formal firms as well. Given further below in this chapter is an extensive list of potential questions that may be useful in guiding the conduct of the CA.

Staffing and Conducting the Constraints Analysis

There are several specific stages to the CA process, which is expected to take up to three months:

Identification of the CA Team

Countries are responsible for managing the CA, including identifying a CA team leader and a small group of analysts from within and outside the government. The process cannot begin until the country’s core team has been convened. MCC strongly advises countries to staff this CA team with individuals who possess strong and relevant technical skills and who command broad domestic credibility. Without prejudicing the ultimate selection, the MCC suggests that appropriate CA team members might include:

- ★ Senior analysts from the Ministry of Finance, Planning and/or Trade or the Central Bank;
- ★ Experienced economists, sociologists, and political scientists from academia, think tanks and government; and
- ★ Leaders from the private sector, possibly including leaders from chambers of commerce and other broad multi-sectoral business membership organizations.

This list of organizations is not intended to be exclusive, and countries are welcome to draw upon experts from other fields as well. But the menu highlights the economics focus of this endeavor; overall, the CA team needs to possess the requisite technical background, knowledge, and economics skills to conduct a rigorous, data-driven analysis.

Although CA teams typically are composed primarily of country nationals, countries are also encouraged to draw upon international resource people (e.g., donor or NGO staff with deep sectoral and country-specific knowledge) during their deliberations. If desired, MCC can assist in suggesting consultants who have undertaken CAs or similar studies in the past to advise on methodological questions and data sources.

Planning Discussion between CA Team and MCC

Once the country has identified its CA team, a small MCC delegation will meet with them in-country to discuss the technical details of the CA, including the overall strategy and approach, and provide advice on methodological issues with the help of the technical guidance/data package

- ★ **Consultations on preliminary draft of the CA:** While undertaking the analysis, the CA team is encouraged to discuss early findings with a broader audience, make a preliminary draft of the CA publicly available, and convene public discussions around its findings. MCC will provide technical support and feedback to the CA team, as necessary to assist the CA team to meet MCC’s standards of quality for a CA.

- ★ **Production of CA final draft:** Based on the preliminary draft of the CA and feedback from MCC, interested parties and the public, the CA team will agree on a final draft of the CA. This document will form an important substantive basis for ongoing consultations during the project definition phase. MCC strongly encourages that the final draft of the CA be made publicly available, e.g., on the Internet.

Sources of Information and Catalogue of Potential Questions for Constraints Analysis

The results of the CA will need to be driven and carefully supported by data from government and non-government sources. The data should be made publicly available, so that the findings can be easily and transparently explained. Sources of information to be referenced for the CA may include:

- ★ Existing constraints analyses/growth diagnostics, if any;
- ★ Macroeconomic indicators from government agencies and the IMF;
- ★ National and global surveys, including household surveys and studies of the domestic business climate, such as the Doing Business Indicators and the Global Competitiveness Report; and
- ★ Recent Poverty Reduction Strategy Papers, Public Expenditure Reviews, or other donor or national strategic assessments recently undertaken.

The level of effort needed for the CA should be determined in part by the existence and quality of recent relevant studies. The analyses also should be informed by input from representative stakeholders in sectors where key constraints may be manifest. For example, if agriculture is an important sector for the economy, individuals involved in agricultural transport, finance, processing, and marketing should be consulted regarding evidence on the difficulties they face. Similarly, if financial intermediation appears to be inefficient, the CA process should give representatives of private sector financial institutions the opportunity to provide relevant input.⁷ Investigation of constraints on foreign investment should involve consultation with current and potential investors. The CA team, however, will be tasked with analyzing the full information set from all of these sources and ensuring that narrow private interests are not represented as broader public interests within the CA.

The following sets of questions to guide the conduct of the Constraints Analysis are organized according to the potential constraints to growth depicted in **Figure 1**, above. These questions should be freely tailored by the CA team, and taken as indicative of the types of issues useful to consider in the course of the CA, rather than a rigid checklist. Moreover, data availability will vary from country to country, which will help to shape the relative emphasis accorded to various questions.

Financial Sector

Banking System Indicators

It is important to determine the level of development of the banking system, by comparing the following indicators to those of recent years and to those of countries of similar size and population. A country's central bank website is the best source for data.

- ★ Determine the number of institutions and branches. A continuing upward trend in the number of institutions and branches suggests that the market is not yet saturated, while a leveling-out suggests equilibrium
- ★ Calculate the banking system's total assets, in volume and as a percentage of GDP. A higher percentage indicates that the banking system is trusted and being used for more financial transactions.
- ★ Calculate the volume and percentage of investment that comes from foreign sources. A high percentage indicates a more developed and globally-integrated banking system.
- ★ Research Banking Sector Legislation. See whether laws correspond to regional directives and are well enforced. Determine whether there is a reliable credit-tracking system and a credit history bureau which facilitate bank activities and help to eliminate distortion in the selection process for investment projects.
- ★ Examine non-banking markets. Are insurance, micro-credit and stock markets operating at their potential and does the population have sufficient access to credit, insurance and financial services?

⁷ These sectorally-focused discussions can be relatively brief for the purposes of the CA. The key insights obtained therefrom are explored in greater depth and with broader segments of society in the consultative process, and ultimately serve to inform the design and monitoring framework for projects included in the compact.

Interest Rates

- ★ Examine the changes in the loan and deposit real interest rates over the past several years. Determine whether these rates are reasonable by comparing them to those of similar countries. High loan interest rates mean a higher cost of finance which leads to long-term inflationary expectations and thus higher consumption in lieu of investment.
- ★ If real lending interest rates are low: look at quantity measures, such as credit to the private sector as a percent of GDP, liquidity as a percent of GDP, and bank reserves. If those measures are high then you can be somewhat confident that finance is not a constraint. If those quantities are low, then determine if this is a demand issue (meaning finance would not be the constraint) or if it is still a supply issue (meaning some agents have been cut out of the market). Look at lending rate dispersion (according to size of the firm or export orientation) and loan disapproval rates to answer this.
- ★ If real lending interest rates are high, then determine what is making them high: Is it that firms need to pay a premium because the country is risky? This would indicate a lack of access to international finance. Is it because intermediation is very inefficient and therefore the spread between deposit and lending rates is too high? This would suggest bad intermediation. Or is it because funds are scarce and therefore deposit rates need to be high to compensate for it? This shows a lack of domestic savings.
- ★ Calculate the Bank Margin (difference between the loan interest rate and deposit interest rate) and compare it to the past several years and to the benchmark countries. A lower bank margin indicates a more competitive banking sector that will attract foreign financial institutions.
- ★ Calculate the share of non-performing loans. This percentage should be low.

Lending Dynamics

- ★ Calculate the levels of profit, gains and capitalization in recent years in the banking system. Increases in profits and in the amount of credit indicate strength.
- ★ Determine whether the structure of loans has changed significantly over recent years. An increase in consumer loans indicates growing trust in the banking system and growing institutionalization of informal sectors.
- ★ Examine the trends in remittance flows. Determine whether these remittances contribute to productive activities or to increased import consumption and what effect this has had on the competitiveness of local goods. Determine whether remittance flows have had an appreciative effect on the local currency.
- ★ Determine levels of loans to small businesses as a percentage of total bank credits. Growing levels indicate a broadening of the formal banking sector, while a preference for large enterprise lending may hinder growth by ignoring the potential of the small enterprises.
- ★ Determine the volume of longer term credits (more than two years). Growing shares of longer-term credits indicates healthy levels of liquidity, capitalization and gains.

Natural Capital

Studying a country's endowment with natural capital may help to explain parts of its development. Location, size, access to trade routes, land quality, climate, water availability and disease prevalence all play a role in development.

Size and Location

- ★ Determine whether the country's location provides easy access to trade routes, especially maritime routes.
- ★ Use Faye et al.'s study⁸ to calculate the country's Transportation Costs Index, which estimates the relative ease of transporting goods. A high index score indicates difficulty in accessing trade routes, which may be a hindrance to development. One way to determine transportation costs is to calculate the difference between fob (free on board) and cif (cost, insurance, freight) of trade flows.
- ★ See who the country's major trade partners are and whether trade to these countries is relatively easy or difficult. If a country trades almost entirely with easy-to-access neighbors, the Transportation Costs Index may not be particularly relevant. If a country trades primarily with hard-to-reach or far-away markets there may be opportunity for improvement in cost-effective trade patterns.

⁸ Michael Faye, John MacArthur, Jeffrey Sachs and Thomas Snow, "The Challenges Facing Landlocked Development Countries", *Journal of Human Development* Vol. 5, no. 1, March 2004, pp. 31-68.

Terrain Endowment

- ★ Determine the amount of arable land and the anthropogenic (man-made) impact on the country. Countries with low percentages of arable land and/or high anthropogenic impacts may experience problems with population density, pollution, and scarcity of agricultural resources.
- ★ Take into account the geological conditions of the country. Frequent earthquakes, landslides and other natural disasters may hinder development by adding to construction costs and financial uncertainty and discouraging investment. Soil conditions may also affect levels of road infrastructure depreciation, leading to higher maintenance costs.

Climate Conditions and Internal Water Resources

- ★ Examine the volume, frequency and volatility of rainfall, including the occurrence of droughts and floods.
- ★ Consider factors such as frosts, pests and diseases that may affect crop productivity, and whether there are tools in place for dealing with these problems.
- ★ Calculate the freshwater capacity per capita and rates of withdrawal to determine whether the water resources are overused and pose a current or future problem for the country.
- ★ Calculate the use of water per agricultural worker to the agricultural productivity per worker and compare these figures with those of similar countries to determine whether scarcity of water resources might be a factor in lower agricultural productivity.

Climate-Associated Diseases

- ★ Determine whether the country's climate puts it at risk for diseases such as malaria, tuberculosis and yellow fever. Compare the incidence of climate-related diseases to surrounding countries.
- ★ Explore the methods used to combat these diseases to see where progress could be made.

Assessing the Human Capital Endowment

To determine whether scarcity of human capital is a constraint to growth, we look for telling distortions in returns to education, unemployment rates and business training.

Returns to Education

- ★ Calculate Returns to Schooling by running a Mincer regression with the data from household surveys. The basic equation is: $\ln(\text{hourly wage}) = b_0 + rS(\text{completed years of schooling}) + b_1E(\text{potential labor market experience} = \text{age} - S - 6) + b_2E^2 + e$. (The squared experience term accounts for lifecycle earnings – there is always first an increase, then a flattening.)
- ★ If r is positive then earnings increase with education. Since the function is in logs on the LHS, and in levels on the RHS, r should be interpreted as the percentage change in earnings for an additional year of schooling
- ★ If you find high returns to education, then analyze educational attainment. For this analysis, you can use either Barro-Lee data⁹ or the Household survey. If you find high educational attainment, human capital is not a major binding constraint for the country (although it may become so in the future). Since there are high returns to education, there is demand for highly educated workers, so you might want to think about investment in tertiary education or access and quality improvements in the post-primary formal and non-formal education system.
- ★ If you find low educational attainment, human capital might be a binding constraint, with the attainment indicator suggesting which educational level presents a problem.
- ★ Look to see what surveys or studies have been conducted by the country's government or independent organizations regarding gender inequalities in school enrollment or attendance, from primary to tertiary levels.

Distribution of unemployment

- ★ Analyze the unemployment rate versus the level of education in the country. If the unemployment rate among highly educated and skilled workers is low, then these critical skills and knowledge are scarce. Especially look at the 15-34 year age group, as this group should in theory have more relevant education and be more mobile and flexible, so any distortions should be more apparent in this age category.
- ★ If there is a higher unemployment rate among younger, more recently educated holders of higher degrees, this

⁹ <http://www.economics.harvard.edu/faculty/barro/data.html>

suggests not a scarcity of human capital but rather a lack of quality or relevance of advanced education in relation to the market economy needs.

- ★ Examine gender gaps in unemployment, in relation to gender gaps in education. This provides information as to whether the problem lies in access to education, or other factors that discriminate against women in the labor force. Look to see what surveys or studies exist that analyze these gender gaps and their underlying causes.

Enterprises Perception

- ★ Calculate the labor force participation rate and compare it to similar countries. Abnormally low participation rates may indicate that the market needs more highly skilled workers. Examine gender differences in labor market participation. Compare also the needs in additional labor by businesses and businesses' perception of labor force quality to the perceived needs in the benchmark countries. Relatively high needs and/or low perceived labor force quality suggest a scarcity of human capital.
- ★ Determine the percentage of companies that offer formal training to their employees. A high percentage indicates a need for more highly skilled workers and thus a scarcity of human capital.

Infrastructure

General Overview

- ★ Compare the quality of the country's infrastructure to that of similar countries by using benchmarking studies of indicators measuring access to electric power, railways, telecommunications and water supply and sewage services. The EBRD Transition Report¹⁰ is one useful source of country comparisons. The World Bank also periodically undertakes regional studies that are relevant to a partner country¹¹.
- ★ Run a regression with cross-country data to see if the country's infrastructure general quality versus its per capita GDP, PPP lies above or below the regression line. If the country falls above the line, infrastructure is probably adequate to the GDP.
- ★ Compare the quality of these infrastructure components to that of several years ago to see whether there is general improvement or reduction in quality.
- ★ Check the results of the World Bank survey on constraints to enterprise development to see whether companies complain about safe electric power, water supply services, obtaining connection to the electric power grid or telecommunications network, or any other infrastructure-related issues.

Telecommunications Infrastructure

- ★ Determine whether the telecommunications infrastructure is adequately developed, by calculating the number of telephone stations per 1000 inhabitants, the percent of families with a computer, the percent of the population with access to the internet and the penetration of mobile phone usage. Compare these figures to those of similar countries.
- ★ Explore the legislation in place regarding telecommunications requirements, including operator's activity, technical conditions, and licensing. See whether there is a Ministry of Information Technology Development or similar regulatory agencies and whether they have a viable development strategy.
- ★ Determine the total volume of sector revenues as a percentage of GDP and the breakdown of those profits among fixed-line telephone, mobile telephone, internet services, cable and air TV companies. See whether these markets have been privatized and whether the largest companies hold a monopoly of the market share.
- ★ Compare the country's telecommunications infrastructure versus per capita GDP to the regression line for similar countries. If it falls above the line, this indicates that telecommunications are adequate to the level of development.

Water Supply and Sanitation Infrastructure

- ★ Calculate the percent of the population that is connected to water and sewage services in both rural and urban areas. Plot these figures versus per capita GDP to determine whether the country falls above or below the regression line for the benchmark countries.
- ★ Look to see if any surveys or studies have been conducted by the country's government or independent organizations regarding the quality of the water and of the water services, health impacts attributed to poor water

¹⁰ <http://www.ebrd.com/pubs/econo/series/tr.htm>

¹¹ See, for example, http://www-wds.worldbank.org/servlet/WDSContentServer/1W3P/IB/2006/08/03/000016406_20060803153210/Rendered/PDF/wps3987.pdf

and sanitation, and distortions in time allocation associated with poor access to water and sanitation.

- ★ Explore the governmental agencies responsible for the development of the water supply and sewage services to see what their development strategies are and how the water supply networks operate. See whether the institutions in charge have the capacity to collect sufficient fees to cover operational and maintenance costs and any other issues related to taxes, investments and regulation.

Ground Transport Infrastructure

- ★ Use the World Economic Forum ratings to compare the country's ground transport infrastructure quality to similar countries and run a regression of quality versus per capita GDP to see where the country falls in relation to the regression average line. You can disaggregate roads from railways to see whether the country fares significantly differently in these two areas.
- ★ Calculate the density of roads (km of roads per 100 sq. km) and the population per 1 km of road. Compare these to similar countries.
- ★ See whether any studies have been conducted by the World Bank or others regarding the quality of roads and road maintenance. If you find that over time the percentage of roads classified as in a "Poor or Extremely Poor" state has been increasing, road negligence may be a major problem. Estimate the current asset value of the road network and compare it to the estimated value were the network in proper condition.
- ★ Consider the vehicle operating costs associated with roads in poor condition and the cumulative losses by all users of roads in the past several years. Also consider the number of deaths caused by road accidents per 100,000 people and compare this number to other benchmark countries.
- ★ Explore policy papers that discuss options for financing the expansion of the road network or maintenance of existing roads. If applicable, compare the price of gasoline and diesel fuel in the country to the prices in other benchmark countries to see whether a tax on gasoline might provide enough needed funds.

Energy Infrastructure

- ★ Use cross-country data to construct a regression line of the quality of the electric power supply infrastructure versus per capita GDP and see where the country falls relative to the line. This will indicate whether in general the energy infrastructure is adequate.
- ★ To determine whether the energy source for the country is stable, find the major sources of energy. Track the change in prices for these energy inputs to determine whether energy prices are likely to rise, fall or remain constant in coming years.
- ★ Using the World Bank Enterprise Survey data, compare the lost value due to deficiencies in electric power supply as a percent of sales to the benchmark countries. If it is significantly higher than in other countries, this is an area that may require attention.
- ★ Calculate the volume of GDP per one unit of energy used and the energy consumption as a percent of sales and compare it to similar countries to determine whether the country uses energy efficiently. The more inefficient a country is in energy use, meaning a low level of GDP per unit of energy and a high level of consumption as a percent of sales, the more an increase in energy prices will hurt the country by making the country's enterprises less competitive.
- ★ If the majority of the country's energy comes from a particular country, carry out the same analysis of that country's energy use efficiency to determine how changes in energy prices may indirectly influence your country via the effects on the energy exporting country.
- ★ Compare the losses of electric power in the course of its transportation and distribution as a percent of obtained energy for all of the benchmark countries to determine if energy losses during transportation are a major cause of energy use inefficiency. Track these losses over the past several years to see whether progress has been made in reducing these losses.
- ★ Explore whether the energy sector equipment is well-maintained and updated, which can prevent the depreciation that causes losses during transportation and distribution. See whether the government is currently doing anything to encourage more efficiency
- ★ Another way to try to determine the demand for energy infrastructure is to look at use of imperfect substitutes (electricity generators), as this might indicate that infrastructure is a constraint on businesses.

Innovations

The Export Basket Size and Composition

- ★ Calculate the growth in the number of exported goods over recent years, for 4- and 6-digit products (according to the UN's ComTrade database's Harmonized System), for all goods and for those valued at over USD 50,000.
- ★ Compare the top ten 4-digit product exports last year to those of several years ago to see if there has been much change. If new products have risen to the top of the export list, this suggests that the country is able to innovate.
- ★ Compare the percent change in the number of exported goods to the benchmark countries. If the country shows a relatively large percent change, this suggests the ability to adapt and innovate better and faster than similar countries.

Exports Sophistication Level

- ★ Use the EXPY index to determine the level of export sophistication of the country. The EXPY is a measure of the productivity of a country's exports¹². Plot it in a regression with other countries to see where the country falls.
- ★ If there is one dominant export that might be skewing the overall EXPY, remove this export and do the analysis again to see how the EXPY changes.

Patents

- ★ Find data on the number of patents filed in the country from the national patent office. Plot the number of applications received and the number of patents issued for the past several years, separating the resident applicants from the non-resident applicants. See how the number of patents issued compares to similar countries by running a regression. If the country falls above the line, innovation ability is unlikely to be a major constraint.

Innovations at the Enterprise Level

- ★ Using the World Bank's Doing Business Guide, compare the percent of firms in the country that adopted new production technology and the percent that launched new products to the benchmark countries. Compare the past year with a point several years ago to see if there is much improvement.
- ★ Compare the percent of sales spent on Research and Development to the benchmark countries. Also compare the country to others in terms of the percent of firms who have access to foreign technology, through either new joint ventures or new license agreements with foreign partners. If these numbers are relatively low, innovation may be a binding constraint.

Macroeconomic Risks

Economic Growth

- ★ Track the growth rate and the inflation rates over the past ten years. Compare the average growth rate with that of the benchmark countries. Try to explain changes in the growth rate as part of the country's historical context and see if you can see any correlation between the inflation rate and the growth rate.

Inflation

- ★ Explore any governmental statements or policies regarding inflation or national attempts to control it. Try to explain variation in the interest rate in terms of the financial and political situation of the country and external influences.
- ★ Determine whether there is any correlation between monthly and quarterly evolutions of monetary aggregates and inflation rates. A strong correlation indicates that inflation has a monetary feature, whereas a lack of correlation indicates that inflation is generated by non-monetary factors or is "imported."
- ★ Determine whether inflation might be influenced by energy or other large imports, as the reliance on these imports puts the country at the will of the exporting country's financial situation.
- ★ Compare the inflation rates of the past few years to those of the benchmark countries. If the rate is higher than the other countries', inflation may be a binding constraint.

¹² An explanation and use of the index may be found in <http://ksghome.harvard.edu/~drodrik/Chinaexports.pdf> and in http://www.un.org/esa/sustdev/publications/industrial_development/1_1.pdf

Budget Deficit

- ★ Track the budget deficit over the past ten years. Compare these trends with those of the other benchmark countries. Even if the country shows a low budget deficit or even a budget surplus, there may still be cause for future concern. Explore the country's relationship with the IMF and other lending institutions to try to predict whether the budget deficit is likely to increase in coming years.
- ★ Consider the government's plans for social development and tax policy to see whether there is cause for concern regarding future deficits.

External Position

- ★ Determine the current trade deficit and track the evolution of this trade deficit over the past several years. Calculate the trade deficit as a percent of GDP and compare this to the benchmark countries. If the country has a relatively high trade deficit as a percent of GDP, this indicates that the economy is consumption-oriented and that the productive sector is unable to meet the domestic demand.
- ★ See to what extent the trade and current account deficits are covered by remittances. If remittances cover most of this entire deficit, it is not a cause for concern.
- ★ Chart the evolution of the terms of trade for each of the benchmark countries over the past ten years to see how the country compares. If the terms of trade have become progressively worse over the years, we can conclude that the external competitiveness of the country's goods is low.
- ★ Graph the Fiscal Balance, the Public Debt, the Trade balance and the Current Account all as a percent of GDP over the past ten to fifteen years to get a feel for the general trends.
- ★ Compare the trends in the country's Public External Debt over the past several years with those of benchmark countries. Also follow the trends in the years to reach Effective Financial Maturity and the Effective Interest Rate over the past ten to fifteen years.
- ★ Try to predict how the Current Account Deficit will evolve over the coming years, considering levels of remittances and the rate of borrowing in the private sector. Determine whether the Current Account Deficit will reach levels high enough to worry investors in terms of the risks involved in investing in the country.
- ★ Compare the country to the benchmark countries in terms of Long-term Risk Premium Rating (Moody's Investors Services and Fitch IBCA), Adjusted Basic Margin, Risk Premium total percent, and Risk premium percentage for the country.

Investment and Business Climate

Foreign Direct Investments

- ★ Track the amount of FDI over the past several years and compare it to benchmark country aggregates.
- ★ Explore the regulations in place surrounding entrepreneurial activity. See whether regulatory-type constraints are mentioned by companies as an impediment to their development. Make note of the specific regulations that companies mention, as these will be issues that need to be addressed.
- ★ Calculate the current and previous year's FDI as a percent of GDP and compare this to the benchmark countries. Track this percent over time, compared to aggregates of the benchmark countries. Determine whether this relative percentage is explained more by the GDP level or by the amount of FDI. To do this, calculate the amount of FDI per capita in each of the benchmark countries and the cumulative per capita FDI over the past fifteen years.
- ★ Try to come up with reasons why FDI might be low, including geographic, social, policy, cultural, educational and economic factors.

Conditions for Doing Business

- ★ Use the World Bank's Enterprise Survey Index and Doing Business Survey for this section of the analysis.
- ★ List the Major Mentioned Constraints, as a percent of companies that complained about each of the listed constraints. Compare these percentages to the aggregate for the benchmark countries to see where the country differs most from the others.
- ★ Compare the country's ranking of doing business to the benchmark countries, using the past two years of the doing business survey to see whether the ranking has significantly changed. Chart the change in the rankings among all of the benchmark countries.
- ★ Graph the changes in each of several sectors, each ranked at a scale of 1 (no obstacle) to 4 (major obstacle), and using 2002 as a benchmark year. Sectors that surpass the benchmark line indicate deterioration in the business environment, while those that are below the line indicate improvement.

- ★ Compare the country's ranking in each of the conditions for doing business to see which parts of the business environment need the most attention and improvement. Chart the change in each of these components over the past year to determine where progress is being made or lost.
- ★ Compare the cost in time and money as a percent of per capita income of licensing to the benchmark countries. Compare across these countries as well the cost and time needed to start a business. See whether there is one particular area that is relatively higher than in other countries.
- ★ Compare the taxation policies of the country with those of the benchmark countries, charting both the total tax payable as a percent of gross profit and the number of payments. Compare as well the Share of Central Government Revenues derived from taxes as a share of GDP, and the time in hours required for preparation, documentation and payment of taxes. As long as the country falls somewhere in the middle on all of these comparisons, the tax system should not be a major binding constraint.
- ★ Determine the marginal tax rate for the high income bracket and the levels of corporate tax compared to the income tax to see whether these are abnormally high. Also look at consequence outcomes such as informality and evidence of tax evasion.
- ★ Explore the process involved in tax payment, including the records that companies are required to submit, the various steps involved, and the amount of time and resources dedicated to these procedures to determine whether the tax payment system could be simplified.
- ★ Look at the Import/Export regulations in terms of the number of documents and time required for both export and import, comparing the country to the benchmark countries and the world to determine whether the Export/Import regime is overregulated. Even if a country ranks near the middle of this indicator, its particular characteristics such as lack of access to markets may be an important impediment to trade and economic development.
- ★ Compare the Labor Force Recruitment and Discharging indicators to those of the benchmark countries to determine which aspects of the labor market might be overregulated.
- ★ Compare the level of corruption in the country to others, using the amount of unofficial payments paid for a typical company to get things done, as a percent of sales.
- ★ Compare the level of confidence in the judicial system across the benchmark countries. If this level is low, the country's entrepreneurs may not trust the judicial system to protect their investments, making investors unwilling to take risks required for starting a business.

