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## Growth Diagnostics: Strengths and Weaknesses of a Creative Analytical Framework to Identify Economic Growth Constraints in Developing Countries

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*This paper discusses the Growth Diagnostics approach developed by Hausmann, Rodrik and Velasco. The approach suggests an analytical framework to identify the most binding constraints that hamper economic growth in a specific country at a specific point in time. Aiming at higher-order principles of neoclassical economics, Growth Diagnostics allows policy-makers to creatively develop policy designs which address the most binding constraint while taking into account relevant factors of their country's economic, political and social context. Most importantly, it considers both orthodox and heterodox policies as possible solutions to ignite growth.*

*Against the backdrop of changing economic policy advice from the big push idea to the augmented Washington Consensus, the authors analyze the reasoning behind the Growth Diagnostics approach. Criticisms by academics and practitioners serve as a basis for a discussion on the approach's possible shortcomings. The authors conclude that Growth Diagnostics is a useful tool to inform growth strategies in developing countries, whereas the new framework's flexibility is discerned as both its essential strength and its main weakness. Among the approach's most important contributions are its explicit renunciation of economic rules of thumb in favor of fact-based diagnosis and context-specific policy design, its ability to identify reform*

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*priorities based on expected impact as well as its caution with respect to potentially adverse second-best interactions between different policy reforms.*

**Keywords:** *Growth Diagnostics, developing countries, economic growth, economic policy reform, Washington Consensus*

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## Introduction

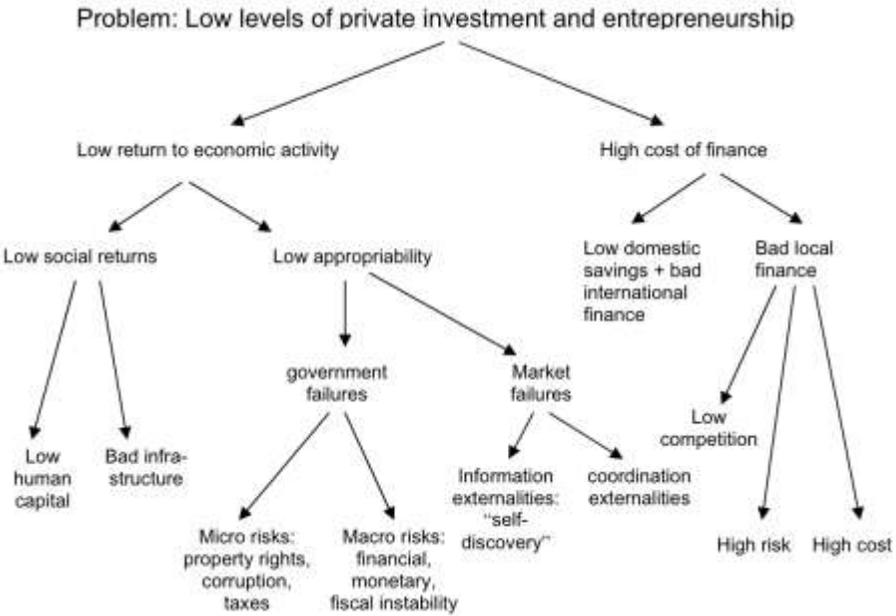
Economists have been debating what policies best serve a country's economic growth for almost as long as the discipline has existed. Easterly (2001: xi) sarcastically compares their ongoing search for the drivers of growth in developing countries to the "quest [...] for a precious object with magical properties: the Golden Fleece, the Holy Grail, the Elixir of Life."

A novel approach now promises to set aside the changing recipes and blueprints that have informed growth strategies in the past and instead be more context-specific. Growth Diagnostics suggests an analytical framework to identify the most binding constraints that hamper economic growth. Policy reform would then be carried out in a prioritized manner and taking into account the country's contextual realities.

The Growth Diagnostics approach promises to apply neoclassical economics in all its flexibility. While the economic policies and institutions that lead to growth differ from one successful case to another, Rodrik (2007: 21) asserts that there are first-order economic principles which are present in all success stories, such as "a semblance of property rights, sound money, fiscal solvency [and] market-oriented incentives". Most importantly, there is an infinite number of orthodox and/or heterodox policy designs and institutional frameworks that can potentially implement these principles: the principles themselves "come institution-free" (Rodrik 2007: 29).

A Growth Diagnostic of a given country's economy can be based on national data, cross-country comparisons, comparisons with similar neighboring countries, international rankings or enterprise surveys. The data is scrutinized with the aim to find the most binding constraint to economic growth, following the forks of a decision tree (figure 1). For each

level of this multilemma, the diagnostician has to ask herself what kind of signal the economy would be likely to emit if the element in question were the most binding constraint.



**Figure 1:** Growth Diagnostics decision tree (Hausmann, Klinger & Wagner 2008: 22)

The initial Growth Diagnostics paper by Hausmann, Rodrik and Velasco<sup>1</sup> and its practical applications have enjoyed much attention from academics and practitioners alike. Hausmann, Klinger and Wagner (2008) and Rodrik (2010) adapted and complemented their original work based on feedback from peers and practitioners. Some of the debates and criticisms with respect to the Growth Diagnostics approach will be discussed in this paper. The authors' critical appraisal is divided into two chapters: a first one

<sup>1</sup> Hausmann, Rodrik and Velasco submitted their original draft to discussion in 2005 and later published it in Stiglitz & Serra (eds) 2008. In this paper, we refer to it as Rodrik 2007.

that reflects criticisms with regard to the approach's theoretical and methodological basis and a second one that considers challenges in terms of its practical application.

## **Theoretical and methodological criticisms to Growth Diagnostics**

Several criticisms have been raised with regard to the assumptions and methodological fundamentals of the Growth Diagnostics framework: Have reform blueprints really failed to deliver? Is Growth Diagnostics an unscientific approach or disciplined art? Is it realistic to search for and focus reform on only one binding constraint to growth? Is the Growth Diagnostics decision tree biased towards private investment?

### ***Have reform blueprints really failed to deliver?***

Rodrik (2007: 85) states that the crucial "economic paradox of our time is that "development" is working while 'development policy is not. By and large, decades of policy reforms and aid interventions that followed the logic of a big push of public investments did not deliver on their promise of triggering a positive upward spiral of growth (Easterly 2001: 37). Similarly, structural reforms based on the so-called Washington Consensus set of economic policy reforms across the board (Williamson 1990) mostly failed to yield sustained growth (Rodrik 2007: 86).

There are a number of counterarguments to this assertion, all suggesting that the policy blueprints did not actually fail to deliver.

The first type of counterargument is that Latin America and Africa have not undertaken enough economic reforms from the Washington Consensus cookbook in order to trigger sustainable growth. Given that many leaders on these two continents spent "considerable political capital in pursuit of Washington Consensus-style reforms", Rodrik (2007: 86) dismisses this argument as not doing justice to the great efforts undertaken. Moreover, he points out that, in blatant contrast, the adepts of the Washington Consensus were indeed very quick to attribute temporary successes of such incomplete reform efforts to the workings of their recommendations, e.g. in 1990s Argentina until the crisis. Rodrik also

challenges that reforms were not deep enough: “[t]he countries that performed well, for the most part, are not those that undertook ambitious reform agendas—quite to the contrary” (Rodrik 2007: 87). Real-world politics usually lead to second-best solutions that can rightfully be criticized for being insufficient or even counterproductive. Washington Consensus reforms in Latin America were successful in stabilizing the crisis-ridden economies of the region, but ultimately failed to automatically trigger economic growth, as their proponents had expected them to do. Given how many of the most successful Asian economies kick-started growth with small but decisive policy innovations, the argument of insufficient reform is indeed unsatisfactory. It appears more likely that the Washington Consensus-style reforms in Latin America and Africa were simply not enough focused on context-specific priorities.

A second counterargument is that the reforms had been effective, but their results in terms of growth have not manifested themselves yet. This would mean that the reforms undertaken need to be maintained; their payoff simply exhibits a time lag. The argument that the growth effects of Washington Consensus reforms in the 1990s have yet to be awaited seems rather weak as it is not consistent with empirical research about reform and economic growth (see for example Tokarick 2008): growth responds relatively quickly to reforms that address critical obstacles and bottlenecks in an economy. However, it can be argued that the difference between post-reform growth and the calamitous GDP contractions of Latin America’s lost decade in the 1980s was indeed considerable.

A third counterargument identifies external circumstances, such as a slowdown in the overall growth of industrial countries, as the main culprit, rather than an alleged ineffectiveness of the reforms. However, many developing countries achieved impressive growth rates in the very same economic environment. For instance, notwithstanding the industrial world’s recessions, China’s export-led economy consistently grew at rates from 6 to 14 percent per annum between 1990 and 2008 (World Bank 2010).

Finally, a fourth counterargument states that the countries which successfully achieved sustained growth over the last two decades were those that had followed conventional economic policy advice in line with the Washington Consensus recommendations. According to Rodrik (2007: 87),

this view ignores that the success stories were almost all characterized by heavy government intervention, such as the industrial policies in South Korea and Taiwan, and/or heterodox reforms, such as China's dual-track strategy: "China did not simply liberalize and open up; it did so by grafting a market track on top of a plan track, by relying on TVEs [township and village enterprises] rather than private enterprise, and through special economic zones rather than across-the-board trade liberalization. [The counterargument in question is often based on the idea] that partial, heterodox reform efforts in these countries would have yielded even more fruit had they been more by the book. One commonly hears that India, for example, would have grown faster had its government been able to reform more comprehensively and rapidly. The trouble is that one looks in vain for countries that did in fact reform more comprehensively and rapidly than India did and ended up with higher growth." (Rodrik 2007: 87). It would in fact be hard to argue that the impressive growth of China, as the most prominent example, was due to rudimentary and incomplete Washington Consensus-style reforms. Rather, the country's growth strategies have been heterodox to the core since Deng Xiaoping's first reforms. They have, however, been creating ever more orthodox incentives for expanding economic activity and increasing productivity.

All above-mentioned arguments in defense of a narrow interpretation of the Washington Consensus can rightfully be questioned. We have to bear in mind, however, that the Washington Consensus, as it was identified by Williamson (1990), aimed at crisis-ridden Latin America. It can be argued that the Washington Consensus was never actually a general blueprint for growth, but rather a set of recommendations for Latin American countries that had all suffered roughly the same external shocks and were haunted by the same types of government failures, which led to low appropriability of returns to economic activity. Applied to a specific Latin American country, the Washington Consensus reforms were then adjusted, sequenced and prioritized in accordance with the national context. For instance, a 1998 World Bank Country Economic Memorandum for Mexico recommends the following priorities for policy reform: "[R]eforming the legal underpinnings of the financial sector, especially in the areas of strengthening creditor and shareholder rights [...] and in terms

of better legal enforcement; [i]mproving the incentive structure in the labor market by reducing non-wage labor costs or, alternatively, by creating a more transparent link between contributions and benefits, [...] [s]trengthening the deregulation effort and domestic competition policies [and] [c]ontinuing the expansion of education attainment levels.” (World Bank 1998: vi)

The criticism of the Washington Consensus as a dogmatic blueprint may be exaggerated against this backdrop. Orthodox adjustment programs based on the Washington Consensus recommendations should certainly be credited for the stabilization of many Latin American economies in the 1980s and 1990s. It is however justified to dismiss the Washington Consensus as a recipe for growth on the grounds that it is prone to oversimplifications and, most importantly, that it categorically excludes creative, unorthodox policy mixes. Its failure to deliver sustained growth in Latin America is likely to be connected to this fact. To overcome the most binding constraints to economic growth, decision-makers probably need a more targeted approach that identifies priorities for reform and defines a higher-order goal without anticipating (let alone prescribing) the exact policy design to achieve it.

### ***Is Growth Diagnostics an unscientific approach or disciplined art?***

On a methodological level, one of the main criticisms towards the Growth Diagnostics approach is the absence of a scientific formula in its procedural application (Sartor 2007: 12). Unlike growth regression analysis, for instance, it only provides a framework to formulate hypotheses on binding constraints to growth rather than hypothesis on empirical tools to test them. Thus, the identification of the most binding constraint can be perceived as an arbitrary choice by the respective practitioner. Leipziger and Zaghera (2006: 2) criticize that “these tasks rely on the creativity of the analyst and his or her ability to formulate hypotheses and create plausible ‘stories’ that can then be verified empirically”. Along those lines, Nobel Prize laureate Mike Spence reportedly appraised the framework as a “disciplined art” rather than science (Leipziger & Zaghera 2006: 2), allowing for a more open-ended analysis.

In response, Sartor (2007) proposes a formulaic procedure to make Growth Diagnostics more scientific. He suggests building on the International Monetary Fund's currency crisis early warning system. These models have been able to produce statistically and economically significant results on the probabilities of currency crises by means of regressions on a number of relevant variables, such as overvaluation, reserve losses or export growth (Sartor 2007: 13). Adopting this model for Growth Diagnostics could serve as "an additional tool to help the analyst make a correct diagnosis" (Sartor 2007: 19).

These suggestions miss the point that, from a practitioner's perspective, the absence of a formulaic procedure to diagnose the binding constraints, is an important disciplining factor. The methodological openness of the approach obliges the analyst to tailor her diagnosis to the specific context, without being able to rely on confined hypotheses and standard regressions to test them. Naturally, this does not mean that it is undesirable to introduce a more systematic guideline for the application of the Growth Diagnostics approach. In fact, Hausmann, Klinger and Wagner (2008) undertake a first such attempt by presenting a "mindbook" to assist practitioners in the implementation of the approach.

### ***Is it sensible to search for and focus reform on only one most binding constraint to growth?***

Another important general criticism of the Growth Diagnostics approach contests the idea that an economy has a single most binding constraint that hampers its growth or, if it does, that it is necessarily optimal to address it first. Rodriguez (2005: 2) argues that under certain conditions it appears more favorable to reduce two binding constraints by half rather than focusing reform entirely on relaxing one constraint as far as possible. He asserts that Growth Diagnostics is a non-linear programming problem that may require more than one solution to solve: "[...] we are trying to maximize a function with constraints, but where both the function and the constraints are so highly non-linear that we have no idea where the maximum lies" (Rodriguez 2005: 3). The analogy to a non-linear programming problem leads him to conclude that addressing one constraint at a time is usually an inefficient way to maximize that function. Hausmann, Klinger and Wagner

(2008: 24) counter that “not all provided inputs are important constraints, as they do not all bind at the same time. If agents find expected returns to be dismal, changing the availability of finance may do little to investment. [We] suggested focusing on the constraints that have the highest direct effect in order to increase the chances that the impact would overwhelm potentially negative second-best interactions. There may be more than one [constraint] that either fits these conditions or that one cannot discard as potentially fitting them”.

Similarly, Jeffrey Sachs reportedly said that Growth Diagnostics might be a useful tool in a functional economy, where it would be legitimate to fiddle on certain binding constraints in order to improve growth at the margin. In contrast, he argues that the economies of many developing countries are so dysfunctional that marginally improving growth by concentrating on the most binding constraint will only produce modest returns at best and fail to deliver the big push that these countries purportedly need. In such cases, it would therefore be preferable to aggressively tackle several constraints at a time instead of focusing on only one binding constraint (Jeffrey Sachs, as conveyed by Sartor 2007: 19). This argumentation misses a crucial point about the Growth Diagnostic approach. Instead of assuming *ex ante* that any developing country with a dysfunctional economy is necessarily constrained by a supply-side lack of physical capital (the big push idea), the approach suggests diagnosing the context-specific obstacles in order to target and prioritize reforms, the political capital for reforms being a scarce resource like any other. Focusing on the most binding constraint first in no way means that the reforms cannot or should never be radical. Furthermore, once the first constraint is reduced to a reasonable level, reforms are meant to go about the second one and so on. As Rodrik (2010: 37) puts it, the successful countries in terms of growth are those that “[...] identify sequentially the most binding constraints and remove them with locally suited remedies.”

When an economy faces more than one very critical obstacle to growth, it may indeed be sensible to focus reform on more than just one constraint that appears to be a bit more problematic and urgent than the others. The main idea behind the Growth Diagnostic approach is that policy-makers should avoid addressing different constraints simultaneously

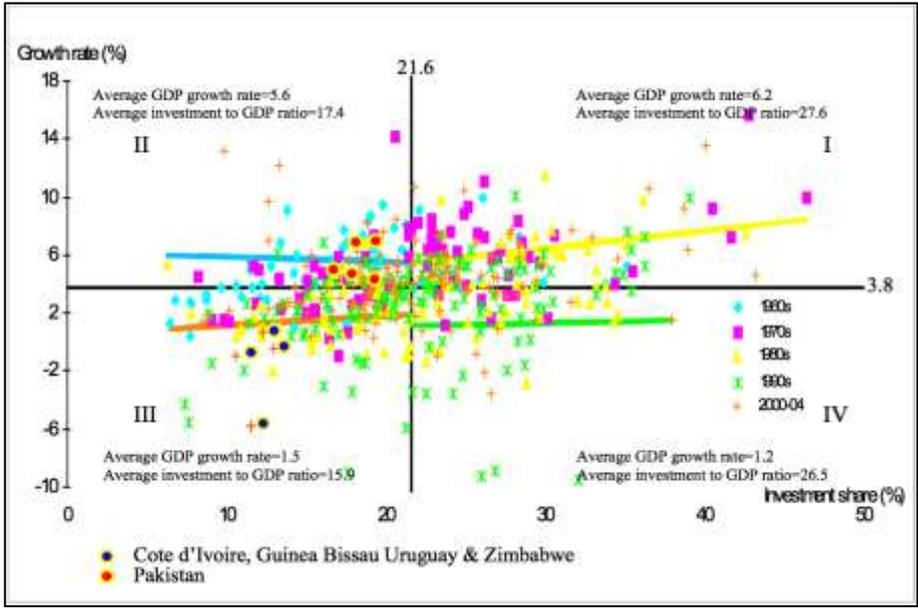
if there are adverse interactions between them or if they do not have sufficient political capital for several parallel reform processes.

*Is the Growth Diagnostics decision tree biased towards private investment?*

Starting from an endogenous growth model, the authors of Growth Diagnostics understand private investment and entrepreneurship as the main driver of economic growth. Hence, they defined low levels of private investment and entrepreneurship as the central challenge that sits on top of the initial decision tree in figure 1. This choice suggests that the approach is based on findings about the long-term growth achievements of successful developing countries by Rodrik in 1999 (64): “the key is to induce the private sector to invest by enhancing the perceived returns to private investments and to generate a virtuous cycle of profits, investments, and capacity expansion.” Fernandez-Arias (2008) argues that in some cases, aggregate investment may seem an adequate choice, but it may also be hiding important misallocations. Hausmann, Klinger and Wagner (2008: 23) respond that “[...] asset accumulation is seen as an interesting area to search for symptoms of a problem because problems get reflected in investment behavior, independent of the relative importance of such behavior on growth [...].”

Felipe and Usui (2008) directly challenge the choice to put private investment on top of the decision tree, arguing that there is no established statistical association between investment shares and growth rates. They admit the relevance of private investment to kick-start growth. However, they caution that “once a country is growing, a high and increasing investment share may not be a necessary requirement in order to continue growing or even to accelerate growth. Indeed, historically, there are many countries that have achieved high growth without a high investment share” (Felipe & Usui 2008: 8). The scatter plot in figure 2 (Felipe & Usui 2008: 9) shows the annual GDP growth over five periods (1960s, 1970s, 1980s, 1990s and 2000-2004) and the corresponding investment share of GDP for 146 countries. The vertical line represents the overall mean investment share of 21.6 percent; the horizontal line stands for the overall mean growth rate of 3.8 percent. These two lines divide all 514 data points into four quadrants. Quadrant I in the top-right corner shows countries with above-average

growth rates and investment shares. Quadrant II in the top-left corner shows above-average growth rates but investment share below the world average. Quadrant III to the bottom-left shows below-average growth rates and below-average investment shares. Finally, Quadrant IV to the bottom-right shows below-average growth rates but above-average investment shares. Note that the regression lines depict the relationship between the countries in each quadrant and *not* the relationship between all countries in a specific period.



**Figure 2:** Growth rates and investment to GDP ratios (Felipe and Usui, 2008: 9)

Felipe and Usui (2008: 10-12) draw several conclusions from this graph:

- (a) Overall, the correlation between investment share and growth is positive and statistically significant. Nevertheless, it is not significant in all quadrants: it is only significant for quadrants I and III. Hence, the empirical evidence of a positive relationship between investment share and growth rate found in various studies is driven

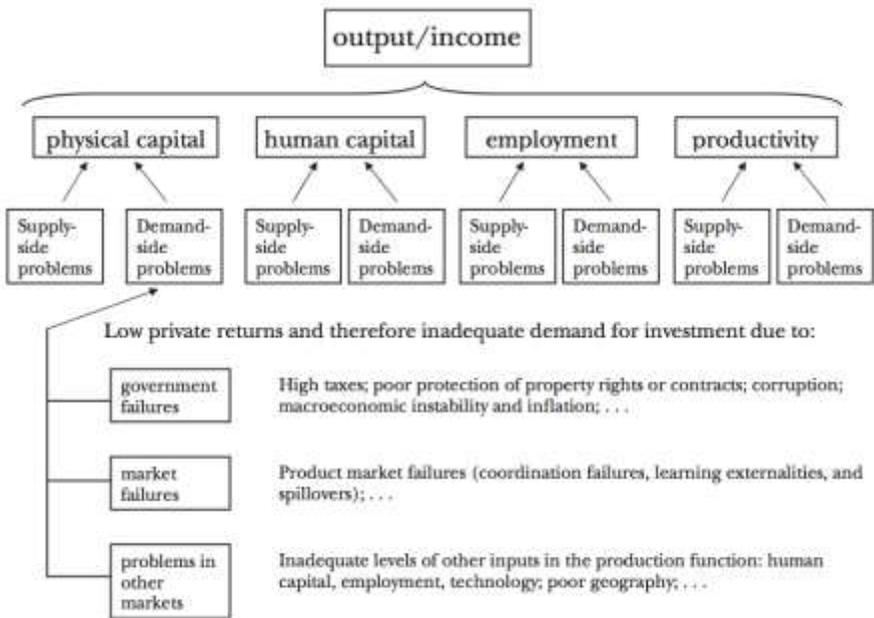
by an analysis of countries that either have low investment ratios and a low growth rate (quadrant III) or high investment ratios and high growth rates (quadrant I).

- (b) Countries situated in quadrant IV exhibit a similar above-average investment share as the well-off countries in quadrant I. Consequently, their growth performance is unlikely to be hampered by low private investments. In other words, the Growth Diagnostics decision tree in figure 1 is not suitable for these countries. The binding constraints to growth have to be sought elsewhere.
- (c) Countries in quadrant II have achieved similar growth rates as countries in quadrant I, but associated with a below-average investment share.
- (d) The authors argue that the Growth Diagnostics methodology should apply only to the countries in quadrant III, i.e. countries with both below-average growth *and* investment share. The main objective of the approach should thus be to identify the reasons why these countries find themselves in quadrant III and, ultimately, suggest context-specific policies to help them achieve higher investment shares and growth rates and thereby move to quadrant I.

Felipe and Usui (2008) also examine the transition path of 44 countries that were in quadrant III in the 1990s to study where they ended up in the period 2000-2004. 20 of these countries remained in quadrant III. 24 countries shifted to the other three quadrants: out of these 24, 11 countries shifted to quadrant II. These efficient countries achieved an above-average growth rate with investment shares that still lay below average. 4 countries shifted from quadrant III to quadrant IV, meaning that, even though they achieved a higher investment share of GDP, their growth rate did not improve considerably. And finally, 9 out of the 44 countries shifted to quadrant I following the path suggested by the Growth Diagnostics decision tree in figure 1, that is, achieving higher economic growth by increasing private investment. They conclude that economic growth is also possible without increasing private investment; the binding constraint may well lie outside of the decision tree in figure 1.

Furthermore, it could be criticized that the decision tree in figure 1 does not actually consider a possible lack of entrepreneurship separately, as the stated problem at the top of the tree would suggest (“Problem: low levels of private investment and entrepreneurship”). Most importantly, the problem may not actually lie with low levels of investments, but with their inefficient allocation or their quality.

Rodrik (2010: 36) implicitly integrates the criticism that low private investment and entrepreneurship are not necessarily the main challenge that hampers growth. Five years after the publication of the first draft of Growth Diagnostics, he supplements the initial decision tree with a higher-ranking decision tree (figure 3) that includes potential obstacles in the supply and demand of not only physical capital, but also human capital, employment and productivity.



**Figure 3:** Higher-ranking Growth Diagnostics decision tree (Rodrik 2010: 36)

### **Growth Diagnostics in practice: a useful tool to inform economic policy in developing countries?**

The Growth Diagnostics approach is tailored to make economic policy reform in developing countries more effective in terms of growth impact. Practitioners have raised a number of concerns with regard to the framework's practical applicability: Is an exclusive focus on growth itself appropriate in high-poverty contexts? Can shadow prices be adequately factored into the analysis? How should potential future constraints be dealt with? Is there a clear-cut transition from igniting growth to sustaining it? How can practitioners derive a cure to the malady they identified by means of Growth Diagnostics? Finally, when comparing a country case study by the World Bank (2002), which essentially follows the Washington Consensus approach of wholesale reform, to Growth Diagnostic case studies of the same country, are the results any different?

#### ***Is an exclusive focus on growth itself appropriate in high-poverty contexts?***

The Growth Diagnostics approach places an exclusive focus on economic growth. Thereby, it declines to explicitly consider policy reform objectives that are interconnected or even potentially conflicting with growth, such as poverty reduction, satisfaction of basic human needs, income distribution or environmental protection (Felipe & Usui 2008: 7). From this perspective, one could ask whether the approach is appropriate to inform the growth strategies of countries which face great challenges in these fields, in particular in terms of widespread multi-dimensional poverty. We argue that, indeed, it is: growth increases incomes and provides the government with fiscal resources to achieve other policy objectives.

While development should be a broad approach that aims to improve human capabilities (Sen 1999), economic growth is the main challenge for developing countries. Growth is the engine of poverty reduction, as it translates into higher incomes. However, some associate economic growth with outcomes that are not favorable to the poor, particularly in political discourse. Empirical evidence clearly suggests otherwise. Dollar and Kraay (2001) sampled 137 countries to examine how increasing average income relates to the income of the poorest quintile.

They find that the income of these poorest 20 percent of society increases proportionately with average income. This strong linear relationship between growth and poverty reduction has been demonstrated most impressively in China. Deng Xiaoping's economic reforms had reduced a number of constraints to economic growth around the early 1980s. Thereafter, China's economy started growing at a sustained and rapid pace and thereby lifted over 600 million people out of extreme poverty (i.e. less than 1.25 USD PPP a day) in the first 25 years after Deng's reforms (Chen & Ravallion 2008). Even in cases where a growth episode mostly benefits the wealthier segments of a population, increasing average incomes still translate into higher tax revenues, which the government can use to alleviate the sort of the poorest segments of their population. Moreover, economic growth does not only improve the income of poor people, it also brings positive change in other dimensions of poverty, such as health. Examining cross-national differences, Filmer and Pritchett (1997: 6) find that GDP per capita has the most significant impact on mortality of children under the age of 5, whereas differences in public spending on health account for almost none of the cross-national disparities.

The considerations above do not imply that economic growth is necessarily and automatically pro-poor. In the short run, there can be tensions and time lags between optimizing growth variables and poverty reduction variables. Furthermore, there is a range of considerations on the quality of growth (Thomas 2000) that need to be taken into account to achieve economic, social and environmental sustainability over the long term. In addition, more potent economic growth may not always be the prime objective of a society. Arguably, for some countries in Latin America that have enjoyed reasonably high economic growth over the last few years, such as Argentina and Brazil, social equity and income distribution may deserve greater attention from policy-makers than an additional increase in their respective country's growth rate. At the end of the day, economic growth remains one of the key factors, if not a precondition, to reducing absolute poverty in the developing world.

***Can shadow prices be adequately factored into the analysis?***

One of the most important criticisms from practitioners with regard to the practical application of the Growth Diagnostics approach is that it is difficult to measure shadow prices of resources. Wherever the societal opportunity cost of an economic activity is not equal to the activity's market price, the shadow price designates the objective value of the activity's unit cost in a theoretically optimal solution. If the shadow price of a resource is high, it is assumed that this resource is constraining growth. While this is quite straightforward in theory, it is hard to identify price and non-price signals in practice (Felipe & Usui 2008: 7). In the presence of several distortions, price signals are likely to be insufficient indicators for reflecting relative scarcities. Aghion and Durlauf (2009: 12) argue that even if the equilibrium price of a resource could be measured, it would not necessarily reflect a constraint to growth. The authors underpin their argument by discussing low interest rates under a high degree of credit rationing. "Indeed, the more restricted the access to credit (that is, the more individuals are barred from undertaking their own projects), the more supply of loanable funds there will be in the economy, as all credit-rationed individuals will end up lending to a few entrepreneurs" (Aghion & Durlauf 2007: 20). This results in a lower domestic interest rate even though the local credit market is severely constrained.

Hausmann, Klinger and Wagner (2008) recommend searching for non-price signals as well. They argue that a binding constraint will generally lead to activities and arrangements designed to bypass the specific constraint. For example, strict government control can lead to the formation of informal activities. In such a case, the diagnostician needs considerable in-depth knowledge of the analyzed economy. The measurement of shadow prices through non-price signals amplifies the "disciplined art" problem described above: different researchers applying the Growth Diagnostics methodology can reach very different conclusions.

### ***How should potential future binding constraints be dealt with?***

Another challenge of a Growth Diagnostics analysis is its static nature, whereas development is a dynamic process. This inconsistency over time is decisive for the application of the approach. Growth Diagnostics focuses on constraints that are binding at the time of analysis, but not necessarily in

the future. Felipe and Usui (2008) argue that Growth Diagnostics was designed to identify binding constraints in stagnant economies, but it is not suitable to identify institutional adjustments that can sustain growth in the medium and long run. Hence, Felipe and Usui (2008: 15) conclude that “growing economies are outside the scope of growth diagnostics”. This argumentation is countered by Leipziger and Zagha (2006: 4), who, based on the example of Bangladesh, assert that the diagnostics to increase the growth rate are in principle no different in a stagnant and in a growing economy.

The World Bank (2006) emphasizes the importance of considering *potentially* binding constraints that already require intervention today. In contrast, it can be argued that the Growth Diagnostic approach is flexible enough to consider possible future constraints and target them depending on their urgency. As argued above, it is not easy to find clear-cut empirical evidence even on today’s binding constraints. It is all the more difficult to find evidence for tomorrow’s binding constraints, which may, therefore, lead to more politicized or even arbitrary recommendations. The Growth Diagnostics approach’s emphasis on targeted, evidence-based strategies would be at odds with such subjective projections. Whenever future binding constraints can be identified on a relatively robust basis of assumptions, however, it appears to be expedient to integrate them into the analysis.

***Is there a clear-cut transition from igniting growth to sustaining it?***

Rodrik (2007) puts a strong emphasis on the need for robust institutions to sustain growth in the long term. However, the Growth Diagnostic approach only provides a framework to identify and tackle the most binding constraint in order to kick-start growth. Sustaining economic growth over the medium and long term is usually a more tricky enterprise, however. Thus, Rodrik (2007) emphasizes that growth ultimately requires robust institutions. These can be both formal and informal organizations or sets of rules, practices and customs. Ideally, such institutions “induce socially desirable behavior on the part of economic agents” (Rodrik 2007: 51) and sustain a productive dynamic in the economy (Rodrik 2007: 43). Rodrik (2007) remains rather vague when it comes to applying these considerations in practice, however. It is telling that, in their exemplary case studies on

Brazil, neither Hausmann (2008) nor Rodrik (2007) suggest possible institutional adjustments in order to sustain Brazilian growth after the most binding constraint, the high cost of finance, is removed. Several questions remain unanswered: Are the two phases of kick-starting growth and sustaining it really distinguishable? After the most binding constraint has been tackled and the economy starts to grow soundly, by what standards should practitioners decide whether they should identify the next binding constraint (kick-start) or instead focus on reforming the country's institutions (sustain)?

***How can practitioners derive a cure to the malady they identified by means of Growth Diagnostics?***

Diagnosing a patient with an illness and treating him are obviously two different challenges. How can practitioners translate the results of a Growth Diagnostic into viable options for policy-makers? Pritchett (2008: 39) calls this critical phase “Growth Therapeutics”, which is ultimately “a diagnostic of the [country’s] capability for [reform] implementation”, that is, the policy-makers political capital. Rodrik (2007) does not elaborate precisely on the transition from the identification of the most binding constraints to the identification of adequate policies. By means of real-world examples, he simply points out that it is important to consider both orthodox and heterodox reforms, depending on the context and capacity of the country in question. Hausmann, Klinger and Wagner (2008: 90) provide a general guideline for diagnosticians to close this gap. Growth Diagnostics focuses on the effects of constraints to growth and ideally identifies the most binding:

$$\frac{\partial Growth}{\partial Constraint_i} \quad \max_{i \in I} \left\{ \frac{\partial Growth}{\partial Constraint_i} \right\}$$

Growth is understood as the following function:

$$Growth( Constraint_1, \dots, Constraint_i, \dots, Constraint_I )$$

Consequently, policy  $P_j$  affects growth through its impact on these constraints. In particular, its marginal effect would be:

$$\frac{\partial \text{Growth}}{\partial \text{Policy}_j} = \sum_{i=1}^I \frac{\partial \text{Growth}}{\partial \text{Constraint}_i} \frac{\partial \text{Constraint}_i}{\partial \text{Policy}_j}$$

Given that constraints usually cannot be removed directly, policies have to be found to do so indirectly, but in a politically viable and cost-effective way. In principle, there are innumerable policies that can effectively address a given syndrome. Thus, policies should be designed creatively and against the backdrop of relevant context-specific factors. Local knowledge and ownership are crucial. The question remains whether the technical identification of binding constraints should be scrutinized under the lens of political feasibility. For instance, if a government's political capital is insufficient to tackle the most binding constraint, should it instead address the second most binding constraint, provided that there are no adverse second-best interactions? Or should it rather try to minimally change the first most binding constraint?

***Brazil case studies: Does a Growth Diagnostic lead to different recommendations for reform?***

Does the application of the Growth Diagnostics approach in practice lead to different recommendations for reform than, for instance, the wholesale reform recommended by the Washington Consensus? Brazil lends itself to such a comparison, as both Hausmann (2008) and Rodrik (2007)<sup>2</sup> apply Growth Diagnostics to different time intervals of Brazil's economic indicators. A World Bank (2002) study that scrutinizes the same time period as Rodrik (2007) can be compared with the two Growth Diagnostic analyses as an applied example of the Washington Consensus reform blueprint. Whereas all three studies identify the high cost of finance in Brazil as a priority area for reform, there are fundamental differences between the analysis by the World Bank (2002) and the case studies of Hausmann (2008)

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<sup>2</sup> Note that the work referred to here as Rodrik 2007 is a republished version of the original draft that was submitted to discussion by Hausmann, Rodrik and Velasco in 2005 (see above).

and Rodrik (2007) as regards the question whether an improvement of the investment climate could help spark growth.

Based on the three studies' analyses of possible constraints to growth, a first best solution would be to implement a wholesale reform. In light of the growth obstacles in Brazil around the turn of the century, wholesale reform could have implied simultaneously (a) lowering the level of public consumption and transfers in order to reduce the overall deficit, which would create space for the high investment demand; (b) increasing investment in infrastructure and human capital; and finally (c) simplifying the tax regime and reducing regulatory obstacles and uncertainties for the private sector. However, this wholesale solution would not only require more political capital than the government may possess. It also implies conflicts of aims, such as simultaneously reducing taxes and the overall deficit. As a consequence of such contradictions between different reform aims, Hausmann (2008: 24) argues that a second-best approach becomes unavoidable. Moreover, Hausmann (2008) and Rodrik (2007) assert that wholesale reform would cause serious adverse interactions that could even harm growth. While the World Bank (2002: 25) recommends improvements to the business climate in Brazil as a safe bet to trigger growth, Hausmann (2008: 16) and Rodrik (2007: 80) caution that such reforms could even harm growth due to second-best interactions: reforms that ease the regulatory and fiscal burden of the private sector would make investment even more attractive. This new incentive structure would result in a further increase of private investment demand, which is already considerably higher than the supply of finance in Brazil over the observed periods. The two authors fear that such an additional boost in the demand for investment would force up Brazil's interest rate. This unintended side effect would clearly conflict with any reform effort that tries to address the country's most serious constraint on growth, namely the high cost of finance.

## Conclusions

This paper aimed to provide a critical appraisal of the Growth Diagnostics approach by discussing criticism from academics and practitioners. As discussed above, there have been many critical questions on the approach's

theoretical set-up and its practical application. Some of the most important criticisms have already been addressed by the authors of the Growth Diagnostic approach. For instance, Rodrik (2010) went beyond the initial exclusive focus on the lack of private investment and took the decision tree to a more general level.

A number of other questions still remain, however. Critically, Rodrik's (2007) extensive disquisition on the importance of resilient institutions to sustain growth in the long term does not translate easily into the practical application of the approach. It is unclear whether (and at what intervals) a country should regularly carry out a diagnostic of its most binding constraint or whether there is some sort of threshold of transition, starting from which the country needs to focus exclusively on strengthening its institutions in order to maintain a productive dynamic and successfully absorb external shocks. It is also unclear whether all branches of the decision tree need to be considered in a diagnostic. For instance, Rodrik (2007) and Hausmann (2008) do not discuss possible market failures in their Brazil case studies: neither of them gives an indication as to why information externalities or coordination failures are unlikely to constrain growth in Brazil. Further questions concern problems with the practical measurement of shadow prices, which should be addressed to the extent of the possible in order to make diagnostics more robust. Finally, it should be studied how current trends in the development of the most binding constraint as well as considerations on possible future binding constraints can be integrated into the diagnostic.

Growth Diagnostics provides a very flexible approach to economic policy reform in developing countries.

Firstly, the framework's great flexibility is its strength: it focuses on the higher-order principles of neoclassical economics instead of handing out standard recipes. The latter run the risk of being unsuitable in the national context.

Secondly, in contrast to the list of reforms suggested by the Washington Consensus, which largely focused on government failures, Growth Diagnostics considers a more extensive range of possible binding constraints.

Thirdly, Growth Diagnostics allows countries to systematically and transparently prioritize their reforms, which can be crucial given the limited political capital and fiscal resources of developing country governments. Fourthly, singling out the most binding constraint also helps prevent adverse second-best interactions between different reforms. In its Brazilian case study, the World Bank (2002) fails to consider such interactions when recommending tax and regulatory reforms to improve the investment climate, in parallel to reforms to ease the high cost of finance. Such tax and regulatory reforms would induce more private investment, which was already higher in Brazil during the observed period than the supply in financing for such investment. The resulting second-best interaction would force up the interest rate and thereby worsen the main problem of high cost of finance. As opposed to this, a Growth Diagnostic of Brazil during that period would recommend priority focus on the most binding constraint, the high cost of finance, and thereby avoid the second-best interactions of wholesale reform efforts.

Fifthly, when it comes to designing solutions to reduce binding constraints, the Growth Diagnostics approach explicitly allows for policies that mix orthodox and heterodox solutions to remove the most binding constraints. Thereby, it does justice to the great diversity of recent success stories with regard to policies that effectively triggered economic growth in different settings.

Sixthly, the approach allows for creative and context-specific policy design, which has the potential of more successfully taking into account local economic, political and social specificities. Thereby, it increases ownership of the reform, which helps avoid political anti-reform backlashes, as witnessed in post-Washington Consensus Latin America.

Finally, the approach's flexibility is also its most important weakness. It remains willingly unclear about what policy design is adequate. It thus requires the diagnostician to possess in-depth knowledge of the country's stakeholder dynamics. Moreover, the results of diagnostics by different diagnosticians are likely to be relatively heterogeneous due to the great flexibility in its application. This can ultimately lead to negative perceptions of the framework's usefulness.

Overall, Growth Diagnostics is an appropriate approach to inform growth strategies in developing countries. It provides a useful framework to identify strategic policy choices that successfully kick-start economic growth and thereby alleviate poverty.

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