

Engendering Growth Diagnostics: Examining Constraints to Private Investment and Entrepreneurship¹

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Abstract: The growth constraints diagnostic is a framework that seeks to help countries identify ‘binding’ constraints to private investment and entrepreneurship. Curiously absent from the diagnoses of the 31 countries to which this framework has been applied is any mention of gender gaps. This is surprising given the substantial literature providing evidence that gender gaps in education, income, employment, resource control and access affect economic growth and well-being. This article ‘engenders’ the standard growth diagnostic process through disaggregating key variables by sex, reinterpreting nodes in the decision tree to reflect how they are intrinsically gendered and adding new branches and nodes. It provides a theoretical framework for applying the gender growth diagnostic to help practitioners adopt it in country studies.

Keywords: Economic development, growth constraints, gender inequality

1. Introduction

Growth constraints diagnostics have become a popular tool among international institutions (the World Bank, the Asian and African Development Banks, the US Agency for International Development and the Millennium Challenge Corporation) for analyzing the binding constraints to economic growth. Based on the work of Ricardo Hausmann, Dani Rodrik and Andres Velasco (2008) [hereafter HRV], the growth constraints diagnostic is a framework that seeks to help countries to identify the ‘binding’ constraints on economic activity and the set of policies to reduce these constraints. The decision tree that is the heart of the framework focuses particularly on constraints related to the cost of and returns to private investment and

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entrepreneurship and involves asking and answering a sequence of diagnostic questions about the root causes of those constraints. The diagnostic has been applied to 31 countries, some more than once.⁴ Curiously absent from these diagnoses is any mention of the gender gaps that may influence the level and pace of economic growth. This is striking in light of the large and growing literature that shows that gaps between males and females in different domains – education, labour market participation and others – can inhibit economic growth, especially in low and lower-middle income economies.

The relationship between gender inequality and economic growth works through several channels, both in the long run and short run. Gender gaps in education reduce the average amount of human capital in a society and thus harm economic performance. These gaps lower the quality of the future labour supply and long-run productivity growth leading to short-run constraints on social returns to investment. Similarly, gender employment gaps can artificially reduce the pool of talent from which employers draw, reducing the average ability of the workforce which leads to lower average productivity (World Bank, 2011), depending on the type and degree of exclusion from the labour force and the managerial pool. Gender employment gaps can also reduce growth through demographic effects such as higher fertility, which reduce growth by influencing the female labour supply (Klasen, 1999). Gaps between male and female farmers and entrepreneurs in access to productive resources, such as land and credit, have been found to reduce yields in farms and productivity of firms, lowering overall output. The extent to which each of these channels may affect economic activity depends on the level of development, socio-political context, cultural norms and the specific economic structure of the country.

⁴ See <http://www.hks.harvard.edu/fs/drodrik/GrowthDiag.html> for a list of countries in which growth diagnostics have been applied.

In light of these findings, this article proposes several ways to ‘engender’ the existing growth constraints diagnostics, which focus specifically on constraints to private investment and entrepreneurship. An analysis of channels that affect growth beyond investment, i.e. through the demand side, is reserved for future research. In this article, we begin first with an overview of the growth constraints framework. The next section summarizes the literature documenting the ways that gender gaps in various domains inhibit economic growth. The section thereafter is the heart of the article. It proposes three ways to engender growth diagnostics: through disaggregating key variables by sex in specific nodes of the tree, through reinterpreting specific nodes to reflect how they are intrinsically gendered, and by adding new branches and nodes to the tree that reflect other economic aspects that constrain economic growth. The final section concludes and proposes next steps for implementing a gender-aware diagnostic. While we do not apply the engendered growth diagnostic to a specific country in this article, our aim is to provide a framework for this to be done in future work.

2. The growth constraints framework

In their growth diagnostics framework, HRV argue that the primary cause of slow growth in developing countries is insufficient private investment and entrepreneurship. At a broad level, these low levels of investment are caused by market imperfections and distortions that are rife throughout the economy, some caused or exacerbated by government policies and others that are inherent to a certain market structure. ‘Such distortions drive a wedge between private and social valuations of specific economic activities’ (Hausmann et al., 2008: 327). In order to understand how to engender the growth diagnostics framework, it is important first to discuss the HRV model and then derive the gender implications.

The wedges between the private and social value of economic activity are denoted by $\tau = \{\tau_1, \tau_2, \dots, \tau_k\}$, where τ_i is the distortion in economic activity in activity i . Distortions can be incorporated into a social welfare function in two steps. First,

$$\mu_i^s(\tau, \dots) - \mu_i^p(\tau, \dots) - \tau_i = 0$$

where $\mu_i^s(\tau, \dots)$ and $\mu_i^p(\tau, \dots)$ represent the respective net social and private marginal valuations of activity i . Where these values differ, an economy will overproduce or underproduce the product of that activity. Wedges can also be seen to represent the presence of externalities and failure to produce public goods or manage common pool resources that lead to inefficient allocations of resources.

The change in welfare (u), for an average member in a society is:

$$\frac{\partial u}{\partial \tau_j} = -\lambda_j + \sum_i \lambda_i \frac{\partial [\mu_i^s(\tau, \dots) - \mu_i^p(\tau, \dots)]}{\partial \tau_j}$$

with $\lambda_i \geq 0, i = \{1, 2, \dots, k\}$ being the Lagrange multipliers of the constraints that correspond to each distortion. The value of τ_j can be thought of as a tax that creates a distortion in market j and keeps the net private return to an activity below the social return, thus leading to its underproduction. The term λ_j is the marginal welfare benefit of reducing the distortion. That is, it is the direct effect of the reduction. The second term is the impact of the distortion on the weighted sum of all other differences in private and social valuations. Reducing the distortion is thought to produce an incremental improvement in the social welfare of the average person. This occurs both through a direct effect of bringing the private and social valuations for an activity closer together, and indirectly through the impact of reducing one distortion on all of the other distortions present in an economy.

There are two main implications for the model when the impact of gender inequalities is considered. First, disparities in economic outcomes and power that are caused by a combination of government policy and social norms and customs can be among the wedges described above, distorting markets and leading to sub-optimal outcomes. For instance, gender norms that lead to disparities in educational outcomes can be thought of as a distortionary tax (Dollar and Gatti, 1999; Cuberes and Teignier-Baqué, 2011). Second, it must be remembered that discussing the welfare change of the average member of society is, in fact, discussing changes in the welfare of men and women that result from relaxing a wedge between private and social valuation. In cases where women face severe discrimination, reforms could provide a large boost to their welfare specifically even if the increase in general welfare is more modest.

3. Literature review

As noted above, the literature has identified a number of channels through which gender inequalities in different domains affect economic growth. Most studies focus on human capital and labour markets, although a few also note the presence of women in entrepreneurial activities; these channels are already generically included in the HRV decision tree, but do not reflect any gender dimensions. From a gender perspective other channels are equally salient. The production and reproduction of the labour force in the ‘care economy’, both on a daily and intergenerational basis, is the most salient, but gaps between men and women in political participation and decision-making could be equally relevant if they lead to inferior policy decisions and governance in the node in question.

The work of Stephan Klasen and various co-authors is at the forefront of the empirical literature on this topic. As early as 1999, Klasen identified the direct and indirect pathways through which greater gender equality in the use of human resources affects economic growth. The first pathway works directly through labour markets; it relates to the productivity of labour

and the extent to which economies are making optimal use of their human talents. If ability and talents are assumed to be evenly distributed by sex, then the failure to educate and make use of women's ability and talent to the same extent as men's is a market distortion. This artificial restriction on the pool of talent available in an economy lowers the average productivity of human capital (what Klasen calls the 'selection-distortion effect').

A number of studies have tested this pathway using human capital variables such as gender differences in educational attainment and employment. Klasen (1999 and 2002) found that gender equality in education had a significant and positive impact on growth for a sample of 109 developed and developing countries from 1960 to 1992.⁵ Including fertility and child mortality rates in the growth equation reduced, but did not eliminate, the association between female education and growth, suggesting part of its impact on growth was via reduced fertility and increased levels of health. The implication is that part of the impact of women's education on growth in sub-Saharan Africa is through its impact on fertility rates.

Turning to labour force participation, Klasen (1999) found that growth in female share of the working age population in formal employment has a large and positive impact on economic growth. More recently, Klasen and Lamanna (2009) explored the impact of changes in the female share of the total labour force and the ratio of female-to-male activity rates on economic growth over a longer period of time (1960–2000). Their econometric results show that the rising female share of the total labour force had a positive and significant impact on economic growth, but the gender gap in education only proved significant when sub-Saharan Africa and Latin America in the 1990s were excluded from the estimates.

⁵ See also Dollar and Gatti (1999); Lorgelly and Owen (1999); Forbes (2000); and Cuberes and Teignier-Baqué (2011).

Like Klasen, Stephanie Seguino (2000) found that both male and female education were positively associated with economic growth, with female education exerting a stronger impact over time, in her analysis of data from 20 semi-industrialized export-oriented economies from 1975 to 1995. But notable differences emerge when wages are used as the measure of gender inequality in the labour market. Controlling for gender differences in educational attainment, the gender gap in manufacturing earnings was positively associated with lower unit labour costs and thus export prices. This stimulated growth because low female wages enabled semi-industrialized countries to accumulate foreign exchange that helped relieve balance of payments constraints. This relationship held even when the gender wage gap was adjusted to account for educational differentials across countries and over different time periods. Thus, Seguino argued that gender wage gaps influence growth through their negative effect on unit labour costs and export prices, with a positive impact on profits, and thus investment as well as export demand.

Building on the arguments developed by Klasen, Esteve-Volart (2009) develops a model of occupational choice and talent heterogeneity in which the exclusion of females from the labour market and the exclusion of females from managerial positions lower economic growth. Labour market 'discrimination' of this type leads to lower average entrepreneurial talent and slower female human capital accumulation, which in turn has a negative impact on technology adoption and innovation. Esteve-Volart's panel data regressions across Indian states over the 1961–1991 period suggest that states with lower female-to-male ratios of managers and workers have lower output.

Also directly related to the HRV diagnostic are studies that focus specifically on gender gaps in entrepreneurship (as opposed to wage employment) in agriculture and other sectors and their impact on sector and economy-wide growth. Gender gaps in entrepreneurship include

ownership of productive assets such as land and access to productive inputs like credit, which relate to firm start up, growth, and productivity.⁶ In agriculture, Kumar and Quisumbing (2013) find that strengthening women's land rights is associated with adoption of soil conservation techniques in Ethiopia, and a lower probability of reporting a food price shock. An early study by Saito et al. (1994) found that if women farmers had the same access to fertilizers and other inputs as men, maize yields in Malawi and Ghana would increase by almost 16%. The World Bank (2014) report 'Levelling the Field' surveyed six sub-Saharan African countries and found stark gender gaps in productivity in female-managed versus male-managed plots of land driven by women's unequal access to inputs and returns to inputs. Government intervention policies, such as promoting women's access to fertilizer and other non-labour inputs, are argued for as a means to close the agriculture productivity gap and increase overall economic growth (ibid.).

Beyond agriculture, the International Finance Corporation (2011) reported that as many as 70% of women-owned small and medium formal enterprises (SMEs) in developing countries were either not served or underserved by financial institutions – a financing gap of around \$285 billion. Based on these numbers, Goldman Sachs (2014) estimated that closing the credit gap for women SMEs across the developing world as a whole could boost income per capita growth rates by over 1.1% on average.

A second pathway relates to the positive externalities generated by greater gender equality on household decisions relating to the human capital determinants of growth. If women's access to education and economic opportunities leads to greater investment in the human capital of their children, as suggested by a considerable body of micro-level evidence, it

⁶ As Croppensedt et al. (2013) note, gender gaps are not because women are worse farmers or entrepreneurs than men, but rather because their use of key inputs and services and their control over resources is limited. Evidence suggests that women are as efficient as men in production when given access to the same inputs.

will improve the productivity of the next generation of workers, a longer term impact. Higher levels of female education – and labour force participation – have been found in the micro literature to be a major factor in reducing fertility, which in turn alleviates dependency burdens and increases the supply of savings. Many of these effects operate through the increased bargaining power associated with women’s education and employment and the associated increase in their ability to exercise control over their own fertility, as well as influence investments in their children. Finally, the last channel through which gender equality influences economic growth is through participation in economic governance within public institutions. A growing number of studies examine how the presence of women in public and private institutions is associated with outcomes such as increased confidence in institutions, and the provision of public services, all key ingredients for a favourable investment climate and business development (Chattopadhyay and Duflo, 2004; World Bank, 2011; Sathe et al., 2013). Hallward-Driemeier et al. (2013), for instance, find that increased participation of women at a national level (25% and above) can have a significant positive effect on the removal of discriminatory laws, especially those that inhibit equal property rights for married women, which is critical for entrepreneurship. And, there may even be direct effects on entrepreneurial behaviour. A recent study in India by Ghani et al. (2014), finds significant evidence that women’s entrepreneurship increased with implementation of political reservations that guaranteed women seats in village councils.

Thus, the implication of these studies for growth constraints is clear. With respect to human capital and the labour market, the binding constraint can take the form of occupational segregation, gendered gaps in labour force participation, rates of informality or wage rates.⁷

⁷ See also Tzannatos (1999) and Costa et al. (2009).

Eliminating these gender gaps can be doubly positive, boosting output growth and female wages and lowering poverty rates and levels of inequality. Other binding constraints could be lack of adequate investment in care and unpaid work, both on a daily and intergenerational basis, and women's lack of, or insufficient, participation in important governance processes.

4. Engendering the decision tree

Our approach to engendering the growth diagnostic is three-fold. First, we identify areas of the decision tree that can and should consider utilizing sex-disaggregated data. Second, in line with the issues discussed in the literature review, we identify nodes of the tree that require reinterpretation. Finally, new nodes are added and some restructuring of the tree is done in order to appropriately engender the growth diagnostic. This section also discusses the type of data that would be necessary for analyzing gender-related constraints to investment and entrepreneurship.

As noted above, the HRV framework is actually an investment diagnostic, identifying the constraints to investment in an economy. We proceed with that in mind but also note that one could use the principles inherent in the diagnostic to apply to problems other than absent or inadequate investment. For example, the framework could be reformulated to include constraints to aggregate demand that would lead to low returns to investment even with a lack of supply-side constraints.

Figure 1 shows the engendered decision tree. The nodes that we have reinterpreted and relabelled from the standard growth diagnostic are highlighted in light grey. 'Institutional failures' is labelled 'Government failures' in HRV's decision tree and 'Low human capacities' was labelled 'Low human capital'. All nodes that are engendered either through considering sex-disaggregated data or being reinterpreted in a gender-aware manner have a black box around them. New nodes are highlighted in dark grey, namely 'High wages', 'Low worker productivity',

‘Low wages’ and ‘Weak support for the care economy’. An additional difference from the HRV decision tree is that one of our new nodes, ‘Weak support for the care economy’, exists on multiple levels of the decision tree. Weak support for the care economy can affect human capacities or worker productivity directly and independently of the channel of human capacities (this is explained in more detail below). Note that the only section not engendered on the tree is ‘Market failures’. The discussion of ‘Macro risks’ and ‘Bad international finance’ is omitted below due to space constraints, but is available upon request.

The sections are organized as follows. The top two branches (‘Low returns to economic activity’ and ‘High cost to finance’) are labelled with roman numerals I and II. The next level, (i.e. ‘Low social returns’ or ‘Bad local finance’) is labelled with I.1, I.2., etc. The fourth level is labelled with I.1.A, I.1B, etc. And, finally, the fifth level (i.e. ‘Low human capacities’ or ‘Micro risks’) is labelled with I.1.B.c, I.1.B.b, etc. The analysis below moves from left to right and top to bottom. The lowest level branch of each section of the tree is examined in the greatest detail to see how it might lead to a constraint of the node immediately above it.

I. Low return to economic activity

The diagnostic approach suggests two possible reasons for low returns to economic activity: low social returns and low appropriability of returns.

I.1 Low social returns

Low social returns were first identified by HRV to result from low human capital or bad infrastructure. The latest versions of the diagnostic also incorporate a third node, sometimes titled ‘Poor geography’ (Hausmann et al., 2008) or ‘Natural capital’ (Millennium Challenge Corporation, 2013). Our version of this branch of the diagnostic reinterprets the nodes of natural capital and bad infrastructure from a gender-aware perspective, and adds a new node called low

worker productivity, which encompasses human capacities, low wages, and weak support for the care economy. We begin with the node of low natural capital.

1.1.A Low natural capital

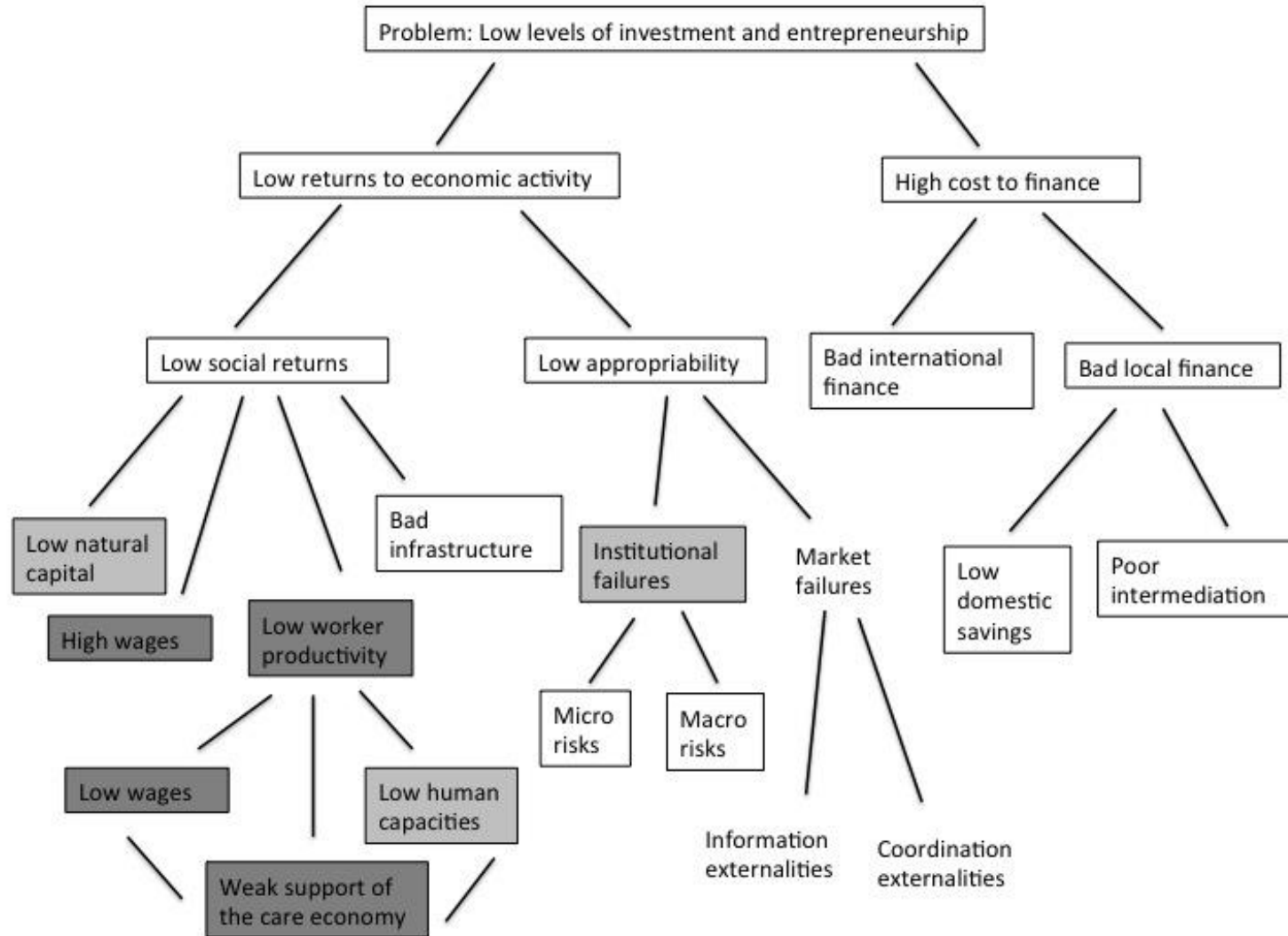
From a gender-aware perspective, we can broaden this node to mean more than just poor terrain or climate to incorporate the social/governance aspects of the management of natural capital.

Bina Agarwal (2001; 2010) documents the different outcomes that can be caused by more male or female participation in community forest groups in South Asia. When women have less power in the groups, forests are more likely to be overexploited for commercial timber. When women have more power over the use of the forests, they tend to be more sustainable and more likely to be used for local needs like firewood. Additionally, when men are in greater control of the resource, they tend to place greater restrictions on women's access, even if collecting firewood from brush has little impact on the number of large trees for timber in the forest. Agarwal (2010) also notes that other options for cooking beyond firewood that may be healthier and more accessible are usually not discussed by community organizations, and the voices of women in energy poverty are not heard by high-level government officials who set policy on these matters.

Changing the allocation of power between men and women may have other impacts on different resources. In some cases, this may cause higher levels of investment as resources are exploited, but that may be limited if this is done too quickly. The result may be a short burst of growth followed by a lack of investment opportunities. Women may be more likely to internalize externalities that lead to overexploitation because of their different social roles, though this should not be assumed. Agarwal (2010) argues that gendered differences simply stem from the different needs of men and women in terms of environmental products; where men use timber for tools, homebuilding, and commercial logging, women need fodder and brush for firewood.

Whatever the relationship, this suggests that the participation of women in the management of some natural capital does affect its rate of exploitation and should be considered in the diagnostic.

Figure 1: Engendered Decision Tree



Source: Hausmann et al. (2008); the authors

National level data on natural resource depletion, along with sociological data on gendered roles in decision-making, to investigate whether issues of gender and natural capital are constraining returns to economic activity, and thus aggregate investment, would be useful. The sociological data would require a specialized survey, but the information on natural resources can be collected through satellite accounts.

1.1.B High wages

It may seem curious that both ‘High wages’ and ‘Low wages’ have been added as additional nodes to the decision tree. The addition of both is necessary to reflect the complexity of wage and productivity dynamics in the short and long run, as well as the role that economic structure plays in affecting growth channels. High wages can constrain social returns as firms’ profits will be squeezed by higher unit labour costs. Evidence of this comes from Seguino (2000), which shows that women’s low wages relative to men’s can function as a stimulus to investment and short run growth. Evidence of high wages acting as a constraint to investment may be firms taking measures to hire workers willing to accept lower wages, such as hiring non-registered immigrant workers or outsourcing production to informal home-based workers. More drastically, firms relocating to countries with lower wages may be evidence of high wages functioning as a disincentive to investment. If high wages are found to be a constraint to growth, the question remains whether the short run benefits of lower wages for attracting and stimulating investment is worth the potential short and long run costs of insufficient wages, discussed in the section below.

1.1.C Low worker productivity

Low human capital is not the only potential cause of low worker productivity. As noted above, we encompass human capital within a broader constraint called ‘Low Worker

Productivity’ which also includes two new nodes. If low worker productivity constrains returns on investment we would expect to see firms making efforts to overcome this constraint by putting extra effort and resources into identifying and hiring workers with higher productivity. This would be reflected in the new node of low wages. In addition, we add weak support for the care economy to the branch to reflect other constraints on the production of labour power.

1.1.C.a Low wages

Low wages are a new node in the decision tree under low worker productivity. Under conditions of efficient labour markets, productivity is theorized to be the determinant of wages. However, in practice labour markets are far from efficient and thus supply and demand models cannot necessarily be used to explain all outcomes. Piketty (2014) notes that while these models can put rough bounds on possible wages, disparate labour market outcomes across countries between similarly skilled workers suggests that social norms and bargaining power play a large role in wage determination and inequality between groups.⁸ Wages that are ‘too low’ are considered for their impact on labour productivity, which in turn affects social returns.

There are two main mechanisms through which low wages can decrease productivity. The first is the reservation wage, particularly women’s reservation wage, which is often related to the cost of childcare and other unpaid work constraints. The second mechanism comes from the endogenous relationship between wages, worker productivity and health (Strauss and Thomas, 1998; Bloom and Canning, 2001; Schultz, 2005; Fomba et al., 2013).

The unpaid work constraints of women are well documented through time use studies (Floro, 1995; Bardasi and Wodon, 2006; Goodwin et al., 2009; Wittenberg, 2009; Budlender,

⁸ Marginal productivity theory cannot fully explain wage differentials, according to Piketty (2014) because in most cases, a worker’s marginal productivity is difficult to observe. This uncertainty effectively leaves room for social norms and power dynamics to play a role in determining specific wages.

2010). These constraints can prevent women from engaging in paid employment if other family members (or hired labour or child care services) are not available to take on household work and care, or if the wage they would receive in the market is not sufficient to cover the costs of market substitutes for their unpaid work (discussed further in the next section). In this sense low wages can disproportionately prevent women from entering the labour market, and in turn can diminish the pool of productive workers.

To investigate whether low wages (based on the ‘reservation wage’) are a binding constraint, data on the relative wages of men and women, their occupations and education levels are needed. Additionally, the labour patterns of men and women should be investigated to understand the relative time they spend performing formal and informal wage work. Very low wages and low levels of labour force participation by women may suggest that small increases in the wage would enable greater and more productive participation.

The second channel through which low wages can constrain productivity is through the channel of health. It is important to recognize better health can lead to more productivity and in turn higher wages, while at the same time lower wages can lead to poorer health, which decreases productivity (Strauss and Thomas, 1998; Bloom and Canning, 2001; Shultz, 2005; Fomba et al., 2013). The part of this channel that requires engendering is considering how the health and care of other members of the household can impact paid work. A positive relationship is understood to exist between health and income (Bloom and Canning, 2001; Currie and Lin, 2007; Fomba et al., 2013). Thus we expect to see higher rates of poor health among low-income households. Poor health takes time and energy on the part of healthy members of the household to care for sick children or adults. Research utilizing US data has shown a negative relationship between child illness and a mother’s work hours (Kuhlthau and Perrin, 2001; Gould 2004).

Controlling for the financial burden of the illness, Gould (2004) finds a reduction in work hours of single mothers in cases where the child's illness is time-intensive, as well as a reduction in the probability of working and work hours of married mothers if the child has a severe health condition even if care time requirements are unknown.

To examine the second channel of low wages as a binding constraint, data on the number of sick and family leave days taken disaggregated by wage or income-level would be useful (although such data are often not available in low and low-middle income countries and would need to be collected). Further evidence that this may be a constraint is if firms and employers are actively taking measures to hire workers who do not have families to support, i.e. asking questions about the number of dependents during the hiring process. National data on health and incidence of disease could also provide insights into the specific health constraints. Note that certain health concerns such as high rates of HIV and malaria require additional policy intervention beyond addressing low wages.

I.1.C.b. Low human capacities

We argue that the node of 'Low human capital' should be relabelled and reinterpreted as 'Low human capacities.' The term 'human capacities' is adopted from Braunstein et al (2013) who explain that in addition to the standard features of education and skills included in human capital, the concept of human capacities encompasses a broader spectrum of characteristics that contribute to workers' effectiveness in an economy such as 'emotional maturity and self-confidence' (Braunstein et al., 2013: 3). Note that considering low human capacities as a constraint to social returns presupposes the existence or possibility of employment opportunities. As Nayyar (2012) argues, a country may invest in the health and education of its population, but if employment opportunities are limited, higher levels of human development may not translate

into greater overall growth.

The first way to engender the node of human capacities is by disaggregating data on education and skill level of workers by sex. Beyond disaggregating by sex, a thorough investigation would also consider if other certain groups of men and women have disproportionately low levels of education and work-related skills, along the dimension of race and ethnicity, religion, and other social stratifiers. This should be done in any application of the diagnostic, but a gender-aware framework would go beyond mere disaggregation to a broader reinterpretation of how human capital can constrain the returns to economic activity and investment on an aggregate level. Beveridge curves (used by economists and policy-makers) show the gap between job vacancies and unemployment in an economy and are utilized to consider whether there is a mismatch between human capital and type of jobs. This graph can be used for an engendered analysis by disaggregating the unemployment line of the Beveridge curve into men and women and disaggregating the job vacancies by skill level. This disaggregated graph can be considered alongside women's educational attainment to reveal whether an insufficiency in human capital has a gender dimension.

The distinction between a misallocation of human capacities versus a lack of human capacities is important. The stock of human capacities in a country may be sufficiently high, but if not allocated efficiently in the labour market, it can constrain the returns to investment. The ways in which this can occur is through explicit discrimination on the part of employers or occupational segregation caused by social norms. A deeper investigation into occupational segregation should consider whether females and males are tracked or self-select into particular

interest areas or fields in middle, high school, tertiary and post-graduate education, and how both choices and gender norms underpin labour market patterns.⁹

Closely related to the misallocation of human capacities is the existence of gender wage gaps. While in the past, economists have argued that gender wage gaps can be explained by differences in human capital, a great deal of empirical evidence shows other factors at play such as sex discrimination (England, 1982; 2005; Berik et al., 2003). Note that the existence of gender wage gaps can also act to reinforce the misallocation of human capacities if women are discouraged from certain occupations because of gender inequalities in pay (Blau et al., 2013).

If women face barriers to entry and/or success in high-skilled jobs in their home countries, there may be an increased incentive for them to migrate to another country where they can pursue their occupation of choice and get higher returns for their education. Dumont et al. (2007) analyze the gender aspects of brain drain and find that current migrant stock in OECD countries is now fairly gender-balanced (including highly skilled workers). However, given the gender inequality in higher education in many of the lowest income countries, there may be a disproportionate share of skilled women emigrating for skilled work abroad (ibid.). The ratio of years of education for women who migrate to women who remain in the home country compared to the combined ratio for men and women will reveal insight into this constraint. The higher the difference between these two ratios, the greater the concern over female brain drain. Data on the occupational choices of skilled women workers working abroad versus the occupational choices of skilled women within the country would also provide useful information.

1.1.C.c Weak support for the care economy

⁹ See Kisselburgh et al., (2009) and Shapiro and Williams (2012) for discussion of lack of females in STEM fields (Science, Technology, Engineering and Mathematics).

We also add weak support for the care economy as an addition to the standard growth diagnostic decision tree. For the purposes of this article, weak support for the care economy is defined as having insufficient resources to support the care of both adults and children on both a daily and intergenerational basis. A weak care economy may be caused by a lack of state support, i.e. little or no government support for care (through the direct provision of services or subsidies to poor families); a lack of support from the private sector, i.e. inflexible work schedules or little or no paid family leave to support care of infants or sick family members; or lack of female bargaining power within the households resulting in inefficient allocation of resources. A weak care economy can affect worker productivity through three channels: the health and well-being of the present day work force; the effect on women's ability to participate in the labour market; and the health and well-being of the future work force. This node requires labour be understood as a produced factor of production.

However, as Walters (1995) notes, most growth theories do not consider labour to be a produced input in the growth process; rather it has been considered as exogenously determined by the rate of population growth. HRV did not explicitly include a labour input at all, presumably because it was considered trivial enough to be left in the background. Yet, a recent theoretical growth model shows how the care economy and unpaid work by women and men is a critical input to growth. Braunstein et al. (2011) model two kinds of labour inputs into the paid economy: short-term production of 'human capacities', for example, daily maintenance in the household sector using women's and men's unpaid labour time, and the commodities that the household purchases, which make human beings more economically effective (for example, productive), and long-term investment in such capacities through education of children, health and building social capital, which raises future productive capacity in ways similar to building

more plants and equipment.¹⁰ They note, ‘as with conventional treatments of investment, investment in human capacities generates current demand for output as well as contributes to long-term economic prospects’.

While there is nothing that inherently places the responsibility of care on women, time use studies reveal that women spend significantly more time doing unpaid care work than men, though the severity of this gap varies by context (Floro, 1995; Bardasi and Wodon, 2006; Goodwin et al., 2009; Wittenberg, 2009; Budlender, 2010). The alternative to care work being done by an unpaid member of the household is to pay a third party to do this work, a choice that requires financial resources. An inequitable distribution of household work responsibilities and lack of quality paid work opportunities can cause women to face stricter time and income constraints than men (Floro, 1995; Bardasi and Wodon, 2006; Blackden and Wodon, 2006; Floro and Pichetpongsa, 2010).

Increased paid work can make it possible to hire household labour and thus decrease unpaid work time; however, the reverse is also true. An increase in unpaid work can constrain individual paid work participation, as was found by Kes and Swaminathan (2006) in their examination of evidence of women’s lost paid labour time due to care for family members with AIDS. Hallman et al. (2006) utilize time use survey data from Guatemala City to examine the impact of the price of childcare in terms of labour hours for women working in the market economy and find that a reduction in the price of childcare significantly increased women’s hours spent in the paid labour market. Weak support for the care economy can also increase occupational segregation, causing a misallocation of human capital. The rigidity of formal

¹⁰ Investing in future labour capacities is almost never treated as investment in standard macroeconomic models.

employment and lack of childcare alternatives may compel women to work in the informal, often lower quality, employment (Mitra, 2005; Kucera and Roncolato, 2008).

Finally, it is important to consider the importance of the care economy for long run economic development. Critical human development, and the capacity to be an effective member of the labour force, starts during the early years of life, especially between the ages of 0–3 (Mendez and Adair, 1999; Evans et al., 2000; Alderman et al., 2006; Maluccio et al., 2009; Heckman, 2007, Walker et al., 2007; Samms-Vaughn, 2011). This is before entry into public education in most countries. Hence, critical human development takes place in the care economy, with inputs from the unpaid work of family members (largely mothers) who care for the child, the paid work of a domestic care worker, or through informal or formal child care outside the home. Braunstein et al. (2013) argue that such care work is an investment impacting future economic outcomes. Thus, private and public resources need to be dedicated to the care economy and policies put in place to improve it.

The first step to investigate whether weak support for the care economy is a binding constraint is to analyze time use data, coupled with data on income poverty. Signs of insufficient support would be a low level of leisure time alongside high levels of both paid and unpaid work, particularly among poorer women. A high incidence of individuals doing simultaneous activities may be further evidence of strict time constraints. The quantity alone of time spent on care does not provide sufficient information. Improvements in household technologies (such as access to electricity for cooking a meal) can decrease the amount of unpaid work time without decreasing the quality of care.

Particularly for low-income countries, information on access to electricity and running water can provide information on unpaid work burden and indicate areas in which government

intervention can alleviate this burden. Similarly, the number and location of health facilities in a country can provide information on how feasible it is for family members to get the sick or elderly into care facilities outside the home, and thus possibly minimizing unpaid care time.

Additional insights can be found by considering government expenditure on child and dependent care; such as publicly funded facilities or subsidies to private providers. Second, an analysis of maternity and/or paternity leave should consider legally guaranteed length of time and whether or not the leave is paid. Furthermore, the affordability of childcare could be examined by looking at the ratio of the average wage of working mothers to the average wage of childcare providers, both home-based and in facilities.

1.1.D Bad infrastructure

Providing infrastructure in both rural and urban areas is critical for economic growth, and benefits both men and women (Agénor and Canuto, 2012; see especially Figures 4 and 5). But lack of adequate physical facilities (such as roads, utility supply systems, communication systems, water and waste disposal systems, and so forth) and the underprovision of services flowing from those facilities typically result in a far greater time burden on women than on men, affecting productivity. Three types of infrastructure are particularly critical: energy, transport, and water and sanitation.

The first step towards engendering the node of bad infrastructure is to ask ‘bad infrastructure for whom and for what activities?’ Answering this question involves getting disaggregated data on access to and use of infrastructure. For instance, with respect to transport, Antonopoulos and Floro (2005) using data from Thailand, and Deere et al. (2012) using data from Nicaragua, both find that a significantly higher portion of men than women own vehicles. In these contexts, investing in public transportation infrastructure may have a greater impact on

productivity than investing in roads for private vehicle use, if doing so would greatly expand the ability of women to travel to jobs, reduce commute times and increase mobility.

Beyond sex disaggregation, an engendered growth diagnostic requires a reinterpretation of how bad infrastructure may be a constraint to investment. Women, either as employees or as owners of a business, face different challenges to men when it comes to mobility and safety. The threat of sexual violence may prevent women from keeping their business open late or prevent women from being able to work late-night shifts as employees. There are ways in which infrastructure can decrease the risks for women travelling alone at night, such as improving lighting at bus stops and along streets.

An engendered approach to infrastructure also requires considering how women's time spent in unpaid work affects their paid work lives. Access to piped water in or near the home reduces time spent collecting water, which in many contexts is considered women's responsibility (Ilahi, 2000; Blackden and Wodon, 2006). As discussed in Moe and Rheingans (2006) and Günther and Fink (2010), access to clean water improves health outcomes, thus positively impacting the productivity of workers in a household and alleviating time spent on care of the sick.

Access to electricity eliminates the need to collect other fuels, such as wood or kerosene for lighting, and makes ownership of household appliances, such as refrigerators, possible. Access to modern cooking fuels also reduces the amount of time spent fetching wood and other biomass fuels. Insufficient investments in these types of infrastructure lead to high levels of unpaid work time, which can prevent women from participating in formal paid employment outside the home, lead to lower levels of productivity in paid employment and inhibit the creation or expansion of small businesses (Chen et al., 2005; Blackden and Wodon, 2006).

The data required to investigate the gendered aspects of bad infrastructure as a binding constraint includes information on access to electricity, water and fuel disaggregated geographically. It is also possible to investigate this issue with macro data, as illustrated by Seguino and Were (2014)'s empirical estimation of the impact of public infrastructure on women's relative employment in sub-Saharan Africa. Time use data can be mobilized to examine patterns of time allocation, mobility and other dimensions of infrastructure use. To investigate women's mobility, crime statistics may give some insights into whether or not violence against women is a significant concern, but often there is underreporting of such crimes. Demographic and Health Survey (DHS) data may provide more valuable insights in this regard.

1.2. Low appropriability

Our engendered growth diagnostic maintains the same structure for the 'Low Appropriability' branch as the original HRV diagnostic. Rather than adding new nodes, this section requires sex-disaggregated data to investigate possible gender-related constraints and a reinterpretation of certain nodes of the tree.

1.2.A Institutional failures

We have relabelled 'government failures' as 'institutional failures' in order to include other failures that fall outside the scope of government policy. For example, complex systems of social norms create informal institutions that can drive a wedge between the social and private valuation of an economic activity. While some may not be the direct result of government policy, if they are found to be a binding constraint, public policies can be implemented in order to relieve those constraints through changing social norms and institutions.

Institutional failures, inclusive of both micro and macro risk, may be caused by a lack of women's involvement and voice in governance in various political and economic spheres.¹¹ As mentioned earlier, several studies have examined how the presence of women in public and private institutions is associated with outcomes such as increased confidence in institutions and reallocation of investment to certain public services (World Bank, 2011; Sathe et al., 2014; Chattopadhyay and Duflo, 2004). Data on women's share of seats in national parliaments are available through the Inter-Parliamentary Union (2016). Attention to women's representation and power in policy making at local and national level can reveal information about institutional failures.

1.2.A.a Micro risks

In the standard growth diagnostic analysis, micro risks that result from government failures include issues of poor property rights, high levels of crime and corruption and excessive taxation. Considering micro risks through a gender lens asks how men and women are affected differently by each of these challenges, which involves working with sex-disaggregated data and reinterpreting the possible challenges.

Property rights are often raised in the standard growth diagnostic analysis as a possible micro risk. Gender norms are very relevant; in many countries, women face challenges in getting deeds to land and buildings in their name, as well as inheriting assets that they have accumulated with their spouse when that spouse dies (Lastarria-Cornheil, 1997; Joireman, 2008; Sjastaad and Cousins, 2008).¹² Such inequitable access to assets is inefficient, as some women who could use land or capital to earn a high return will be unable to do so. An analysis of the property and

¹¹ The section on engendering macro risks is available upon request.

¹² Importantly, the formalization and privatization of land and other property rights does not necessarily solve the problems that women have because of other institutional and social biases that they face (Lastarria-Cornheil, 1997; Ikdahl et al., 2005).

inheritance laws in the country will reveal their level of discrimination towards women, which could suggest the presence of a constraint.

In the HRV framework, taxes can pose a constraint to growth when countries have high top marginal rates on corporate income, inflation taxes and tax policy risks. The gender dimensions of taxation have only recently begun to be researched, and it is not clear whether implicit and explicit gender biases in taxation would be a constraint to growth. Gender differences in tax treatment can affect women's decisions to work or start enterprises, and how much time to supply to these activities. For instance, high marginal tax rates on secondary income in married couples may be a constraint to growth if they discourage married women from seeking paid employment (Stotsky, 2006; Grown and Valodia, 2010). On the other hand, tax credits and subsidies or tax deductions for childcare can increase women's participation in the labour force. These examples are illustrative of the types of questions that need to be examined in a diagnostic.

Finally, an example of an institutional failure not considered in the standard growth diagnostic framework is male appropriation of female income and assets, namely a woman being unable to keep the profits from her business for reinvestment if her husband takes the money. This concern is substantiated by the household bargaining literature and empirical examples from the microenterprise literature (Goetz and Gupta, 1996; Pitt et al., 2006; Garikipati, 2008). Data to examine this possible constraint can come from detailed household surveys. An example of such a survey is the one conducted by American University researchers and HomeNet and utilized in Rania Antonopoulos and Maria Floro's 2005 article on gender dimensions of asset ownership in Thailand (Antonopoulos and Floro, 2005). DHS data also provide intra-household information.¹³

¹³ The section covering 'Bad international finance' is available upon request.

II. High cost to finance

This branch of the tree assumes there are investment opportunities that are privately profitable but finance is constrained by either inadequate access to savings or problems mobilizing savings internationally and domestically (Hausmann et al., 2008).

II.2 Bad local finance

II.2.A. Low domestic savings

The first possible constraint leading to bad local finance is low domestic savings. Domestic savings come from several sources, including households. A weak social welfare system and/or an insecure labour market can lead to a depletion of private savings. In times of crisis or unemployment if citizens cannot rely on the government, it is hard to maintain a stock of personal savings. The microcredit literature suggests that a combination of persistent negative shocks, individual social arrangements and the lack of safe, secure, and convenient institutions in which to save, plays into the reduced savings capacity of poor households (Armendariz and Morduch, 2010). More closely examining the role of gender, Seguino and Floro (2003) utilize macro level data on the gender wage ratio to investigate effects on household savings and in turn aggregate savings. Their results show that as some measures of women's bargaining power increases there is a rise in aggregate savings (Seguino and Floro, 2003). Thus, low levels of women's bargaining power can be contributing factor to low levels of domestic savings.

Measures of women's bargaining power on the aggregate level are difficult to come by, so the sociological literature on social norms and trends would be a useful starting point. New data sources such as the World Bank/Gallup Findex data, which collects sex-disaggregated financial information from 148 countries, could also be used. The data can be used to estimate

the incidence of women with individual savings accounts as well as the amount of money in their accounts, which could be a proxy for aggregate bargaining power.

II.2.B Poor intermediation

Finally, the cost to finance of an investment on ‘average’ may not seem to be a constraint, but it may be the case that a portion of the population faces a high cost of finance while another portion faces a low cost of finance. Reiterating the discussions above, it is important to know who is facing the constraints. The three mechanisms through which this inequality may emerge are through discrimination on the part of lenders, lack of information on the part of borrowers, and physical, geographical, and logistical barriers to bank access.

In their study of financial inclusion in sub-Saharan Africa, Klapper and Singer (2013) find that women are less likely than men to have a bank account, even when controlling for a host of other factors like income, education, marital status and employment status. Similarly, in a broader study of 98 developing countries, Demirgüç-Kunt et al. (2013) find that women are less likely to have a bank account, save or borrow money where they face restrictions on their ability to work, inherit money or head a household. In contrast, Aterido et al. (2011; 2013) discover that gender discrepancies in education, income, employment status and the size of women-owned enterprises explains the gender gap in use of financial services (Aterido et al., 2011; 2013).

USAID has developed a Women’s Entrepreneurship Diagnostic for the very purpose of investigating the difficulties women face in starting and maintaining their own businesses in different environments (de Santos, 2013). One especially salient issue for women identified in the diagnostic is the potential high cost of capital. Such a barrier has been confirmed as a frequent phenomenon empirically (Bardasi et al., 2011). The World Bank’s Enterprise Surveys (2016) and the Global Entrepreneurship Monitor (Singer et al., 2014) are both possible sources for understanding the business environment in a particular country and to compare the various

features against benchmark countries. The GEM's Women's Report is especially instructive in providing an overview of the different rates of female entrepreneurship and conditions that women face around the world (Kelley et al., 2013; Amorós and Bosma, 2014). A survey like the one conducted by American University and Homenet in Thailand, which asked questions about decisions to borrow and purpose of the loan, would also be valuable (Antonopoulos and Floro, 2005).

5. Conclusion

This article has highlighted the importance of considering gender gaps in education, income, employment, access to and control over resources, marginalized spheres of economic activity, and issues of distribution in the investigation of the constraints to investment and entrepreneurship in an economy, on the assumption this can produce a win-win scenario: increases in growth and gender equality. A critical future step is to apply the engendered growth diagnostic to a country. Some bilateral donors (USAID and the Millennium Challenge Corporation) have shown significant interest in engendering their existing growth constraint analysis but to date this exercise has not been undertaken. Evidence from macroeconomic studies that use different methodologies suggests that the application of an engendered method makes a difference. Fontana (2009) engenders the Social Accounting Matrices and conducts a Computable General Equilibrium (CGE) analysis for Bangladesh and Zambia, finding that, in both countries, increases in female market employment leads to a decrease in women's time spent on care work and leisure, a result which is not found using standard CGE models.

While engendering growth constraints analysis adds both time and complexity to the diagnostic process, we suggest the risks of missing potentially binding constraints associated with overlooking the role of gender in the analysis exceed the benefits of greater simplicity associated with the standard growth diagnostic. Along with the increased complexity comes a

need for data that may not be available or be of poor quality in many countries.¹⁴ This poses a significant challenge to practitioners.

In *Doing Growth Diagnostics in Practice: A 'mindbook'* Hausmann, Klinger and Wagner (2008) suggest four possible signs that a constraint is binding,

1. The (shadow) price of the constraint should be high.
2. Movements in the constraint should produce significant movements in the objective function.
3. Agents in the economy should be attempting to overcome or bypass the constraint.
4. Agents less intensive in that constraint should be more likely to survive and thrive, and vice versa (ibid: 31).

In the engendered growth diagnostic framework, reliance on the shadow price of the constraint in many of the nodes is difficult due to a lack of market prices (used as signals for shadow prices).

The other three signs that a constraint may be binding are conducive to the engendered diagnostic approach, but require more complicated data.

Consequently, this article is also a call for a dedication of resources at both national and international level to collect the critical, sex-disaggregated data and other necessary information, for instance adding modules or questions on asset ownership, earnings, and other measures in existing household and labour force surveys. Efforts should also focus on increasing the number of countries that administer time use surveys and improving the quality and frequency of such surveys. Efforts already underway, such as the UN's Evidence and Data for Gender Equality (EDGE) and Data 2X, provide examples of how to collect gender-aware data in key domains.¹⁵

¹⁴ While close to 80% of countries globally regularly produce sex disaggregated statistics on mortality, education and training, less than a third of countries produce gender statistics on informal employment, entrepreneurship, violence against women and unpaid work (Buvinic et al. 2013b).

¹⁵ The EDGE initiative seeks to push existing efforts to have comparable gender indicators on education, employment, entrepreneurship and assets. Data2X aims to advance gender equality and women's empowerment and further global economic and social gains through improved data collection and analysis that can guide policy, better leverage investments and inform global development agendas.

Our hope is that this article draws increased attention to the critical importance of good data for understanding how to alleviate constraints to investment and thus hopefully increase resources available on a national level.

As discussed in the introduction, this framework only investigates the constraints to investment and entrepreneurship rather than other determinants of economic growth and well-being. A useful way forward would be to broaden the diagnostic to include the demand side of the economy and possible causes of insufficient aggregate demand. A gender lens within these alternative frameworks can help ensure accuracy in identifying constraints.

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