A Pluralist Account of Economic Growth

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Abstract

Theories of economic growth usually refer to investment, human capital, trade, and other economic factors (Barro 1991, 1998). A pluralist account can also allow for variations in economic output that are caused by levels of democracy, culturally grounded patterns of labour market participation, gender, and health. In this paper innovative tests of these relationships are conducted using a 40-year international data set. Regression analysis is well suited to the pluralist account because it can test each variable for apparent additional 'effect by augmenting a basic time-series model. Fertility effects disappear once women's labour-force participation is brought in. Attainments in school (averaged over all working-age people) are positively associated with growth but school enrolments *per se* are not. The data refer to the period 1972-2002. The data are compiled from the ILO, UN Common Database, UNDP, Freedom House, and other sources for each decadal time point 1972, 1982, 1992, and 2002. Thus the results are highly up to date as well as innovatively using fixed-effects models to distinguish growth rates from the acceleration of growth.

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Introduction

Among other factors, gender relations may make a difference to the rate of economic growth. Estimates of models by Barro (1991, 1998, and Barro and Lee, 2001) have suggested that gender was not a significant factor in determining the rate of economic growth. Gender's role in structuring the world economy has been documented by a number of authors, though, such as Çagatay and Özler 1995; Elson 1995; Sparr 1994; Standing 1989, 1999; World Bank 2001). In this paper the gender issues are integrated with a wider pluralist model is used in order to allow for a wide range of economic, political and demographic factors as well as the social and social-policy factors that surround the gendered work outcomes of the countries of the world. Some generalizations are known to be true about gender in the world economy and in local micro-economies that make direct or indirect global-local linkages: for instance, women's participation in public politics and decision-making processes makes a difference to the trajectories of each country's economic development (Afshar 1996; Moser 1993; Waylen 1996). However considerable local and national variation in gender regimes also exists, and it may be dangerous to generalize about gender and labour-market exploitation. Evidence at country level for Malaysia shows considerable exploitation and gender-stereotyping, whilst evidence for many European countries shows a reduction in gender stereotypes and a declining but diverse gender pay gap (Ng, 1999; cf. Rubery, 1998; Macrae, 1999, 2003).

A further important connection is that economic growth in turn has implications for gender equality (Bergmann 1986; Çagatay and Özler 1995; Dollar and Gatti 1999; Tzannatos 1999; Walby, 2000). Gender relations have been included in some models of economic growth (Dollar and Gatti 1999; Forsythe, Korzeniewicz and Durrant 2000; Klasen 1999; Lorgelly and Owen 1999; Seguino 2000). For instance, analysis can link the gini coefficient and the fertility rate. In this paper, the inequality issues and the knock-on effects of growth are not the central issue. Instead I try to estimate statistical models that will help to set some boundaries on what generalizations can and cannot be made about gender and economic growth for the period 1972-2002.

Pluralism and economic growth models

Barro's (1991, 1998) work has been important in establishing that a range of social and political institutions are relevant to explaining differences in the rate of economic growth in different countries.[1] These institutions include education, especially in its contribution to the development of human capital, and governance, such as political instability, the rule of law and government expenditure, as well as more traditionally economic ones, such as type of economic system and market regulations.

Barro includes fertility in his model, finding that the higher the level of human capital, the higher the rate of economic growth and the lower the fertility rate. He presents fertility as if it were ungendered by referring to the effects of fertility on parents' time rather than that of mothers: 'The effect on fertility involves an increase in the value of parents' time and thereby a rise in the cost of raising children.

[1] I acknowledge Sylvia Walby's contributions to this review of literature. Her related publications include Walby (2000 and 2005). We have also jointly produced analyses of women's employment achievement (Walby and Olsen, 2005a) and of gendered political democracy (Walby with Olsen, 2005b).

More generally, any change that increases the cost of raising children tends to reduce fertility and to increase desired saving per person. In effect, people shift from saving in the form of children to saving in the form of physical and human capital (Barro 1991: 422).'

However, the effects of different rates of fertility tend to have greater implications for women than for men, since women are disproportionately involved in the care of children. Hence fertility is a gendered phenomenon, rather than gender-neutral. The effects on mothers are not the same as the effects on fathers. Fertility is associated with a range of gendered institutions and factors, including differential gender rates of participation in education, the labour force and the formal political system (Abadian 1996; Ainsworth, Beegle and Nyamete 1996; Becker 1981; Galor and Weil 1996; Gillie 1987; Hobcraft 1987). This means that it is possible that the inclusion of fertility in a model prevents the effects of gendered education, gendered labour force participation, and gendered democracy from being identified. Could a more nuanced understanding of the relationship between a range of dimensions of gender relations and economic growth be developed if gendered variables other than fertility were to be included in the model?

Economic factors associated with economic growth

The paper investigates the impact of gendering a range of institutions that have been shown to be associated with economic growth. Since gender relations vary between different domains (Connell; Walby 1990, 1994), there is no single variable that can capture 'gender' in any given country. Rather it is necessary to gender each of the main domains that are pertinent to the analysis. In the estimates that follow I have have re-operationalised the concepts of 'education', 'employment', and 'democracy', to make visible specifically gendered aspects of them, so as to be able to test for the importance of diverse forms of gender relations. In the case of 'democracy', gender does not appear to matter for growth, but the more economic factors do matter in their gendered form. The pluralist approach with a gender-aware process of operationalisation takes the debate toward new explanatory factors.

Investment

Capital investment is a strand of causality that permeates most economic theories of growth (Agarwal, *; Rostow, 1958; Bhaduri, 1986 to name a few). Thirlwall (*) provides a survey. Increased capital not only makes more production possible, it also tends to push outward the production frontier for a given set of resources through the renewal of equipment and land using newer techniques and technologies. In recent years it has become easier to obtain adequate measures of gross capital formation and of foreign direct investment. These important factors are in the background of my pluralist explanation and they form the core of a basic growth model.

Innovation through trade

Furthermore it has been argued that exporting creates a tendency for each country's manufacturing firms to compete better by adopting techniques that are more efficient or more intensive in the inputs that are most easily and cheaply obtained within the country. Imports may need to be increased in order for exporters to obtain either raw materials or critical inputs, so a trade measure is used in the models of this paper. Other authors have explored the relationship between trade and growth in more detail than is possible here (surveys by Solow, 2001; Aghion, 1999).

A further link between trade and growth may occur when international companies enter a country, permeate its labour market, and upgrade the skills of certain sets of workers. These companies also create possibilities of copying techniques, sub-contracting to set standards, and worker movement between National and international firms, so endogenous sources of growth may arise. The endogenous growth theories focus on the synergy of various inputs to production and their implicit, hard-to-measure link with output and productivity. In some estimates the endogenous growth term is the positive residual term for some cases in a growth equation, although there is also wide recognition that endogenous growth is rather hard to measure. Errors in the measurement of the other real causal factors may be part for the reason for the apparent frequency of endogenous growth to have occurred. In this paper, we allow for endogenous growth by allowing for as many factors as possible, but not by allowing interaction terms. (Interaction terms in the regression would seek to find synergies between specific inputs to production – but the degrees of freedom of the equation are already too small for this to be a reasonable search under reasonable assumptions. In particular, I do not think a random-effects model in which the time-dependence of observations on each country is neglected would be a reasonable growth model. Random effects models are sometimes used to inflate the 'N' of observations and are presented here only for comparison with a more reasonable fixed-effects model.)

Economic History

Each country has its own history, legacy of social structures, traditional cultures, primary products, and consumer preferences. We expect them to each have a unique trajectory, and I am only seeking the commonalities that arise from either having parallel capitalist growth patterns or from being part of waves of upward (and downward) swelling of production in the global economy. Some countries are more or less well connected to these 'swellings' of production. Therefore each country needs to have an indicator variable reflecting its starting level of GDP as they enter the 1972-2002 period that is studied here. I allow for that in the models. A whole series of historical, political and structural factors are subsumed – and almost hidden – by creating such models.

Human Capital

There is a well established empirical association of formal (school and university) education and economic growth. The explanation has usually been framed in terms of human capital (Barro 1991, 1998; Barro and Lee 1994). Competing interpretations sometimes note the social status of higher education and the way it generates expectations in the minds of both employers and employees of higher wages (Fevre, Rees, and Gorard, 1999). These competing interpretations do not dispute the noted tendency for wages to be higher for those with more education. In the work of Barro (1991, 1998), Barro and Lee (1996, 2000) and Barro and Sala-i-Martin (1995), the effect of education, in particular, schooling, is seen to be either gender neutral or to be associated with boys' rather than girls' education. This tendency is consistent with both human capital theory and the more socially grounded, subjective interpretation.

However, this finding of a positive association between boys' education and a negative association with girls' education could be spurious because there is a high correlation of boys' and girls' schooling in the regression equations. One or other should be dropped from the equation, or orthogonality should be aimed at if two variables are used. The attainments of men and women in formal schooling (years) can be treated as a measure of gender inequality by creating a ratio of women's to men's education

(Benavot 1989; Lorgelly 2000; Lorgelly and Owen 1999). This variable is orthogonal to average school attainment.

By contrast with Barro, Klasen (1999, 2002) found that gender inequality in education reduces the rate of economic growth. Klasen (2002) found that male-biased gender inequality in education reduced per capita growth rates directly by lowering the average level of human capital and indirectly because of its impact on investment and population growth. He found that differences of between 0.4-0.9 percentage points in the growth rates of East Asia and Sub-Saharan Africa, South Asia, and the Middle East were accounted for by differences in the gender education gaps in these regions. He concludes that gender equity in education is important for economic and human development.

Employment

A growth in the level of employment has traditionally been associated with a process of economic development and with the overall level as well as rate of economic growth. Employment is generally considered to include both salaried employment and more informal forms of paid work such as having a business, casual paid work, farming, and the informal sector. Unemployment would be expected to be associated with lower rates of growth but it is so poorly recorded in developing countries – and falls under very different welfare regimes – that the variable unemployment cannot be used in world-wide statistical tests. (We have tried to use it but no association was discovered, probably for reasons to do with measurement error and invalidity of the measurements.)

However, the relationship of gendered employment to the rate of economic growth is much more complex. There are two issues: the extent and nature of women's paid employment; and the extent and nature of gender inequality in the labour market.

The first issue is the classic issue of the implications of the extent to which women are engaged in paid employment rather than unpaid domestic work (Boserup 1970). On the one hand is the view that an increase in women's employment is likely to be associated with the growth in the size of the market economy, as women make a transition from unpaid domestic work to paid work in the labour market, and indeed that there may be a mutually reinforcing effect between women's employment and economic growth (Bergmann 1986; Çagatay and Özler 1995; Grown, Elson and Çagatay 2000). On the other hand an increase in women's paid employment that is at the expense of their domestic work may lead to a deterioration in the conditions of existence of the household and be unsustainable, leading to long-term problems (Elson 1991; Sparr 1994).

The notion or assumption that women without 'employment' are not doing productive work has long been questioned. In economics it is widely recognized that women's domestic work has an opportunity cost both in time spent on informal-sector farming and in their lost wages from possible employment (Ellis, 1993). Therefore the trade-off between informal work and paid work is a delicate and complicated one. Because these issues are much more prominent and widely recognized now than in the past, the ILO has begun to include all forms of unpaid labour within its category of occupations and hence in the part of the labour force that is 'active'. Unpaid helpers are presently considered to be 'active' in the labour market whereas in the past they were considered to be inactive. The current terminology for what used to be called 'unpaid helpers' is 'unpaid family labour' which more appropriately designates their tasks, such as farming and shop-keeping, as labour. Labour force

participation rates for different countries have gradually been modernized to take into account these unpaid forms of working – which also might include tenancy, street trading, cooking for eventual street sale by another household member, smoking or winnowing food, and many other activities. Because of this change in the nature of that which is measured by the term 'active in the labour force' – ie by the referent of the term – its measurement must be considered approximate. Women as a percentage of the labour force, in this sense, is rather a different measure from the classical gender ratio among employees. The two are not highly correlated.
The second issue is whether gender inequality within the practices of paid employment is associated with higher or lower rates of economic growth. The various dimensions of this inequality include the size of the gender pay gap (Seguino 2000), the conditions of employment such as job security (Standing 1989, 1999), occupational and industrial segregation by sex (Anker 1998; Forsythe, Korzeniewicz and Durrant 2000), and the extent to which women or men occupy professional and managerial jobs.

Seguino (2000) finds a negative association between gender wage equity and economic growth in Asia, that is, that the high rates of economic growth in Asia are associated with a larger than average gender pay gap. However, the gender pay gap is not a particularly good signifier of gender equity in employment overall. It is also not available for a wide enough range of countries to be used in a global study. An alternative measure of gender inequality in employment is the proportion of women in managerial and professional jobs. This is investigated in the following models. We have studied this factor as a dependent variable in its own right in a related paper (Walby and Olsen, 2005a).

Political and Other Factors Associated with Economic Growth

Health
Ideally differentials in people's health would be put into growth models to allow for deviations from what trends otherwise would be. In other words poverty itself (which is associated with ill health but to varying degrees) can affect the growth rate and create a vicious circle of poverty. Furthermore in recent years the HIV virus and related AIDS deaths have created a serious loss of labour power in a few countries. 17 countries have a rate of HIV infection of over 5% and I have tested for whether this is yet (in 2002, using the 1972-2002 model) having an impact on production. It is difficult to get other measures of health of the working-age population. Using the child mortality rate or maternal mortality rate would not be ideal because they do not refer to current workers. Health is an area in which it may be useful to further explore the effect by linking demographic data sets to the economic and political data used here. In order to make this possible, I have been negotiating to provide a simple table of the combined data for all UN countries in 2002, with their histories back to 1972, via the ESRC Data Archive. It is likely to be available by 2007 and it will be possible to share the data informally under certain legal conditions before that (contact the author via email).

Governance

There is an established association between various dimensions of the form of governance and the rate of economic growth (World Bank 1992). Barro (1991) found that the rule of law, and lower rates of government expenditure were associated with higher rates of economic growth. There is a more contested debate as to the relationship between democratic governance and economic growth and development, in which the outcome varies according to the operationalisation of the concepts (Barro

1996; Bollen and Jackson 1995; Bruetti 1997; Diamond 1992; Ersson and Lane 1996; Leftwich 1996a, 1996b, 2000; Muller 1995a, 1995b). The most satisfactory analyses are those that have included factors that mediate between democracy and economic development, for example, Bornschier and Scholtz (2002) find an important mediating role in human and social capital development, while Muller (1995) finds that social inequality is a mediating factor (though see Bollen and Jackson 1995).

Conventional definitions of liberal democracy have centred on processes that deliver the opportunity for all citizens to contribute to collective political decision-making via a system of representation, especially the right to vote for political representatives in free and competitive elections in the context of free speech and free association (Dahl 1989; Gastil 1982). Although accounts of democracy have not always considered women's suffrage as necessary for a country to be considered democratic (Muller 1995; Rueschemeyer et al 1992), a gender-based critique suggests that a polity is not fully democratic when there is not equitable representation of women (Phillips 1995). There are substantial variations in the representation of women in national elected assemblies, from 8% in the Arab states, 15% in the US, to 40% in Nordic countries in 2005 (Inter-Parliamentary Union 2005). The concept of democracy could be re-operationalised in a gender-inclusive manner by additionally including processes that generate a proportionate presence of women in parliament.

Methodology

The works referred to so far in the review of literature are already pluralist. They are theoretical pluralist as suggested by Dow (2004; 1997), who has recommended a 'structured pluralism' that admits there are structural patterns and regular tendencies in the economy even though there is also much that is unique and locally specific. My work on pluralism has stressed the ontic overlaps between theories – seen here as the overlap between human capital theory and endogenous growth theory; and again in the links between gender theories generally and each of the other factors – whilst recognizing the difficulties that arise when theories are partly incommensurate (Olsen, 2006 forthcoming). It is important to tolerate the theories that have a good grounding in empirical data. It is also important to explore empirical measurement issues that can either improve, or change and modify, existing theories. Given the disputes that have occurred about the role of gender in growth – related to women's fertility, to their education, and to their productivity – this paper stresses a careful, but feasible, operationalisation of each factor in its gendered form.

The paper's methodology is thus based on a realist assessment that countries are not an ideal unit of analysis but that they exist and have collected data, so we can make several compromises in using country data. Furthermore I recognize the weaknesses as well as strengths of regression as a method (Olsen and Morgan, 2005). The use of regression tends to omit factors that are specific to 30 or less cases because they cannot 'appear' to be significant; it tends to make us forget measurement error; and it tends to make us infer causality when it is more appropriate to note correlations (*ibid.*). I have tried to avoid the latter problem by using time series data. The critique of statistics issued by other realists like Lawson (1997) does apply to much of what is presented in this paper. The critique tends to lead to a complete unwillingness to use statistical analysis at all (Sayer, 1992; Kemp and Holmwood, 2003). Instead it would be better to remember that many causal mechanisms will exist without showing their effect(s) in the regression, and that some patterns in the regression do not tease out the real, basic, general or universal causes. Most importantly, although the review of literature has described the characteristics of capitalist development that are typically found in orthodox economics, there is every

possibility that the huge variations of country data away from the means of each variable (and the huge unexplained variance in growth rates) are due to a wide range of important, real, causal factors such as institutions, attitudes, governments, aid interventions, and so on.

Having mentioned this caveat I will proceed to a statistical analysis of a large data set.

The Data

The data were collected from several locations.[2] The data made available by Barro were used where relevant in order to establish the closest possible compatibility with this work. Additional information was included on economic factors from the World Bank and the International Labour Office; on women's parliamentary presence from the Inter-Parliamentary Union; on civil and political liberties, based on Gastil's scaling, from FreedomHouse. Appendix 1 provides all the means of the variables used, both for the whole range of countries and for those used in the main results (73 countries). Appendix 2 provides details of the source of each variable used. Tables 1 and 2 give an overview of the average levels in 2002 and the preceding decades for each main variable.

The dependent variables include growth rates, gross domestic product per capita and the level of investment. The last of these three (expressed as a percentage of GDP) is used as an instrument in the two-stage least squares regressions that comprise the main results. The instrument is shown in Table 3 to be suitable for this purpose, since it is affected by its own independent variables (trade and lagged GDP) but is not associated by the other main independent variables of the growth equations. In Table 3 two measures of growth outcomes are examined. The first is the growth rate of per-capita GDP, calculated as an overall rate over four years surrounding the dates 1982, 1992, 2002. The four-year period's annual GDP levels (per capita) were examined. The rate of growth from 1979 to 1983 was first measured as an exponential annualised rate. If either end-point were missing of the 4-year period, the average (exponential annualised) annual rate of growth for the available years within this period was substituted for this overall measure. In most cases the full four years could be used. Data converted to purchasing-power parity adjusted dollars were not available for enough countries to be useful. Instead, GDP in 1995 constant US Dollars was used. These data are widely available in the World Development Indicators. Each decade-ending growth rate estimate was calculated in the same way (1989 to 1993; and 1999 to 2003). The on-line World Development Indicators database was used to get the latest 2003 data.

Before settling on this measure three alternative measures were examined. First, annual growth rates (ie not per capita, *sic*) were found to be highly unstable and not to have any close association with the causal variables in the growth models. This was true even with population growth rates in the models. Figures 1 and 2 indicate the relative instability of annual (one-year) growth rates of per-capita income compared with the overall movement of GDP (per capita) over the long 40-year period. The 4-year period chosen for study gives an intermediate level of stability in the dependent variable used in Table 3. In Figure 1 the dependent variable for Table 3, columns 3 and 4, can be visualised by seeing the overall movement of GDP over a ten-year period (similar to the ten-year growth rates studied by Barro

[2] The Economic and Social Research Council (UK) grant no. RES-000-22-0526 funded the research. Note: In addition, the support of the ESRC through the programme of the ESRC Global Poverty Research Group is also gratefully acknowledged.

(2000)). Secondly ten-year average growth rates were examined. They did not differ from the four-year interval growth rates by much. They did not show any associations with the other variables in the models. Weighing by population, using lagged values, and inserting a baseline GDP per capita level in a random effects model were all tested. None offered a reasonable model of growth.

Thirdly, PPP per capita growth rates were examined, but there were too many missing values in these rates for the time-series model to give significance. Using data for 2002 only, an association of PPP growth rates with investment can be discerned. However, time-series estimates are needed to tease out the causality that is involved.

The second main dependent variable is the **level of** GDP per capita (logarithmically transformed to reduce skewness). This variable is placed in fixed-effects models where the dependent variable's change over time (ie growth) is compared with the associated changes over time of all other variables in the model. The model estimates the slope of the line relating a change in X to a change in Y. The grand means of X and Y are outside of the remit of the fixed-effects model coefficients. Fixed-effects models have one advantage and one disadvantage in this respect (see Table 3 for a comparison with random-effects models).

The advantage is that they measure the overall growth effects of each causal factor in the model whilst allowing for the very different starting levels of GDP of the various countries. The starting level of GDP (or, to be precise, the grand mean of log of GDP per capita over the whole period) works its way into country-specific error terms in the fixed-effects equations. These can be analysed in their own right, but are left as controls in this paper. The overall structure of the world economy 1982-2002 is revealed in the country-specific error terms. A separate residual error term for each country in each year was randomly distributed relative to the dependent variable (no heteroskedasticity). There was no problem of errors being associated with particular explanatory variables, once the instrumental variables approach had been used. I found a low association of the overall residual error term from the fixed-effects equations with the dependent variable, log of GDP per capita. The fixed-effects models thus performed well.

The disadvantage of fixed-effects models is that one cannot put a constant term into them if that constant is not changed over the whole period of time. The political orientation of country governments, their region or OPEC membership, and the starting-point level of GDP all must be left out of the equation. These constants would be hidden in the time-series results and will get little attention here. Authors such as Plumper and Martin (2003) use overall grand mean models, instead of time-series models, to good effect and in that context the constant values can be included. They tend to show important causal factors over a 40-year period, and not distinguishing between changes in these patterns, whereas this paper is focusing on causal factors over the shorter term of a decade or so.

In the time-series models, the year of the survey (which enters as the decadal time points 1982, 1992 and 2002) is put in as an independent variable. By controlling for time, the overall average growth rate is weeded out of the model. The remaining variation across countries reflects their individual relative economic growth rates. The error term includes any residual not explained by (or at least not associated with) the independent variables.

The economic variables present in growth models include investment, labour inputs, and the educational qualifications of labour. The investment rate (gross capital formation as a percent of GDP) includes any form of investment – public, private, or foreign investment. However, records of foreign direct investment show it to have a low but positive association with gross capital formation. Both variables are used here, so that foreign investment can be tested for having a separate effect on growth. Labour inputs are measured in the basic model using the economic activity rate of people aged 15 and over. The educational qualifications of these workers are measured using the attainment levels estimated by Barro and Lee (2001) and made available online (sources are listed in Appendix 2). Attainment is measured as the average years of education of the population over age 15. These attainment levels were provided on a five-yearly basis, and I have utilised the decadal time points. Up to 1995 these were estimates with interpolation, but for 2000 they were forecasts. Barro and Lee have created the best data on attainments in the world, even with caveats about estimation and extrapolation. Comparisons with UNESCO data on attainments showed limited coverage, especially going back into earlier decades, in the published UNESCO data sets. Barro and Lee themselves utilised a wide range of sources including UNESCO so the estimates are consistent with that source.

Barro and Lee provided attainments data for each gender, as well as overall. The basic growth model is then augmented using measures of attainment among women, relative to the level among men. This ratio is positively but not highly correlated with the overall attainment ratio.

Alternative measures of human capital might include literacy rates and enrolment rates. Close examination of literacy rates showed that they are not always available for the two genders separately, so coverage (from UNESCO) was not as good as Barro's attainments data. The enrolments data are provided in rich detail by UNDP in its annual *Human Development Report*, but this source does not cover the earlier decades of the 1970s and 1980s. These variables are not used here.

The augmentation of the model with democracy variables took three stages. First, the democracy indicator used by Barro was created by averaging the political rights scale and the civil liberties scale created by Gastil (Freedom House indices; see Appendix 2.) Secondly, the involvement of women in public democratic processes was measured by the proportion of women in parliament. This variable's mean has risen overall for four decades, but still there is considerable variation from country to country. Thirdly, curved variants are measured by allowing the variables' squared values to enter the regressions.

The study of gendered employment began by modifying the economic activity rate to consider women's activity rate. However, when using data from the International Labour Office (ILO Laborsta database), many countries' data are selectively unavailable. A new database, the United Nations Common Database (accessed via www.esds.ac.uk), has compiled all available UN data and developed estimates which (like Barro) use a mixture of interpolation, estimation and extrapolation to fill all available dates with the ILO's best estimates. The female economic activity rate is presented there in the form of the proportion of the workforce that is female (ages 15+; variable code 4270). This proportion rises above 50% in some countries in some years. Job quality among women is measured by the percentage of all the higher ISCO categories' workers that are female. This variable is the percent of all professional, administrative, managerial and technical workers in ISCO categories 1 to 3 that are female. Unfortunately it is not widely available so only 44 countries have the full time-series data for this variate.

Controls for the rate of population growth (annual rate at the decadal time-points 1972, 1982, 1992, 2002) and the level of fertility (births per woman on average at the decadal time-points) were included in each regression. These results were rather surprisingly not significant in most cases.

The Regressions
Time-series regressions with fixed effects are used in Tables 4 to 7. These regressions effectively allow for country dummies. Hausman-Wu tests indicated that a random effects model would differ substantially from the fixed-effects models even after instruments compensated for endogeneity. On grounds of consistency the fixed-effects models are preferred. A random effects model – illustrated in Table 3 for completeness – would wrongly assume all observations over time to be independent of each other. This pushes up the r-squared values, but is still an invalid assumption.

The Figures
Illustrations of the movement of the dependent variables are provided in Figures 1 and 2. These are, however, annual data whereas the regressions use panel data for decadal time-points. Only the growth variables are decadal summary variables. The GDP per capita (logged) is a snapshot at each time-point. Figures 3 and 4 illustrate how regression can tease out a positive association from the time-series data, in spite of the fact that gross overall figures suggest no association at all. Thus descriptive statistics in Figure 3 are contrasted with the use of regression predictions in Figure 4 to discover underlying causal mechanisms. The latter method is shown to be worthy of attention. A caveat must be applied, however, that the association of two variables – in this case growth and women's predominance in the labour force – does not simply or necessarily imply that one causes the other. Behind this association are complex country-level scenarios in which women's work can be either 'counted' or not counted, recorded or not recorded, high-paid or low-paid. Depending on these measurement and reward factors, as well as the underlying human capital and production technologies, there is a positive net association between the two factors in a regression context.

Findings

In Table 3 a growth model is presented and the underlying investment relationship is shown. The lagged GDP affecting investment has a negative sign. This suggests that poorer economies (in GDP per capita) that have GDP per capita which is low tend to have higher investment rates (as a proportion of total GDP). Once an economy is rich in per-capita GDP terms, this effect disappears, and the investment rate can be low as a percent of GDP. Using 'growth rate' as a dependent variable, one can examine the factors associated with this phenomenon, but the results in Columns 3-4 of Table 3 are not promising. Contradicting Barro (1998), there is a low correlation of decadal growth rates with almost every independent variable. Investment overall and foreign direct investment, however, do have positive associations with growth rates of per-capita income.

In turning to the use of the **level** of per-capita GDP to measure the factors causing growth, I move away from a model of acceleration and toward a model of growth *per se* (Columns 1 and 2 of Table 3). A positive coefficient indicates that the rise in an independent variable causes a higher the level of GDP per capita. Thus growth would be increased (but not accelerated) by a rise in human capital, as column 1 of Table 3 shows (cf. Column 3). The acceleration of growth would happen later, after a lag, if

growth then caused a rise in investment which in turn created more growth, and if no counteracting factor offset this tendency.

In this model, the level of attainments is statistically significant and positive. Each year of education attained (on average) is associated with a .09 rise in the log of GDP. This is a large effect because a .09 rise in mean log GDP would imply a doubling of GDP for an average country. A rise of .09 on a mean of 7.4 brings the level to 8.066, and after unlogging these numbers, GDP per capita rises from $1635/year to $3184/year. Average attainments actually rise more slowly than this because of the predominantly older populations with low levels of schooling. Nevertheless the strong positive coefficient tends to reaffirm that human capital is an important component affecting growth rates.

A random-effects version of this model gives even stronger results but makes the invalid assumption that the observations are independent for each country between the decades.

An important result from this basic model is that the economic activity rate is not associated with the growth rate. It is neither positive nor negative, just as fertility rates and population growth rates have no statistically significant association with the growth outcomes.

Turning to Table 4, the educational attainment effect is tested to find whether gender-sensitive measurement improves the fit or offers additional explanatory power. The results are negative for attainments. Tests of female attainments (not shown here) and of the ratio of female to male attainments both suggest that rising girls' and women's attainments are not closely associated with higher growth rates. However there have been large increases in these attainments over time. Attainments as well as enrolments tend to stop rising once their average levels reach the highest levels found in high-income countries. Therefore there are difficulties in discerning the impact of increasing women's education. Ironically, increases are concentrated (over the decades 1970-2000) among the lowest income countries. The insignificance of the result for this time period 1972-2002 contradicts the negative (and significant) coefficient that has been found in some other studies.

Table 5 illustrates the differences in attainments (both overall, and for females relative to males) in each region of the world. Regions have large differences in log GDP per capita which tend to be associated with low levels of schooling and a low ratio of female to male attainments. Furthermore, Table 5 shows that the legacy of historical trajectories creates poor performance in Sub-Saharan Africa on the GDP per capita indicator, whilst the Middle East has experienced rapid increases in GDP per capita (ie rapid growth) over this period in spite of low attainments and very low female labour force participation. Variation away from the means of all countries is vast.

Table 7 (in an Appendix) shows the results of adding democracy to the model.

A test of political factors shows that for political rights and civil liberties, a curved fit works best, as Barro and Plumper and Martin (2003) suggest. The relationship is falling, then rising with GDP. This U curve may have reverse causality since economic growth can affect the capacity to afford and manage public democratic processes, whilst democracy itself may have impacts on growth rates. I tested whether the percentage of women in parliament appears associated with growth. Using various combinations of variables, the impact of women in parliament on growth seems to be insubstantial. It is also noticeably not negative.

Table 6 adds a gender-sensitive measure of economic activity to the overall model. The democracy indicator used by Barro is retained, and the overall level of economic activity of people aged 15+ is still 'in' the model but not significant. The level of employment of women, measured here as the percent of the labour force that is female, is significantly positive in its association with growth. A rising level of women's employment, compared with men, is found along with higher growth rates. The types of 'employment' included in this measure are employees, salaried workers, casual workers, farmers, self-employed and contingent workers. However the unpaid workers and domestic workers are not considered to be employed. In other words it is a broad measure of paid employment. (See Appendix 2 for details.) For women's employment to be associated with higher growth rates, there must be either rising human capital in women's jobs, or else technical change associated with women's employment. Further research will need to explore the causes behind the finding in Table 6, Column 1. This result is illustrated using Figures 3 and 4.

In Figure 3, the original gross relationship of women's employment (as a percent of the labour force) with per-capita GDP is depicted. All points from all 3 decades 1982, 1992, 2002 are plotted together. In Figure 4 the predictions from the regression are plotted. Here a positive association emerges. Various other factors have masked this association in the Figure 3 plot.

A further exploration of the data set attempts to examine whether high-quality jobs among women – taken as the ISCO categories 1, 2, and 3 – are the real causal factor behind the result in Table 6. However, only 44 countries could be included in this estimate. Many important countries were left out due to missing data. The attainment variable is insignificant in the equation for this reason, and the results are disappointing. Further research on this topic will require a concerted effort to fill in gaps in the ILO datasets.

Discussion

Overall, two competing interpretations of the main growth model results vie for attention. One interpretation would be that the new data for 2002, which include Barro's variables for democracy and attainments and a variety of other sources of data, have created a new situation in which Barro's older models no longer fit. This interpretation could help explain the lack of significance of women's fertility in the growth models. By placing the Barro and Lee models into a pluralist context and updating the data to 2002, I have made it possible to open up such questions.

The competing interpretation is that the model of Barro and Lee only accounted for human capital and other factors in gender-blind ways. By creating gender sensitivity in critical parts of the model, a new explanation of growth rates begins to emerge. Further research will be needed to explore the interaction of the gendered variants of employment variables with other conditions within particular countries. Notably the policies that influence women's employment rates – and new measurement practices that place self-employment, family labour, and unpaid contributing labour in small businesses "inside" the labour force rather than out of it – will be seen as important parts of the explanation of *why* women's employment appears to be causing higher growth rates. Example of policies that induce women into employment include flexible and cheap child care; flexibility about working hours (some countries still discourage part-time working whereas in western countries part-time work is a crucial area for women's employment); and strengthening the inducements to keeping girls in school.

Educational policy interweaves with employment policy when it comes to girls' school careers and work trajectories. The more schooling they have, the more likely they are to work in 'employment' rather than in private domestic care-work alone.

The growing tendency to measure 'unpaid family labour' in small businesses as if the person was actually 'in' the labour force clouds the picture by changing the measurements used in the time series data. Nevertheless, these changes of measurement are inevitable re-interpretations. Through these changes, the data sets catch up with the growing recognition that women make important contributions to national commercialized production. The data for countries with large farming systems, whose industrial output is a smaller percentage of total GDP, are more affected by such changes. The ILO data on women's employment used here are compiled using a wide variety of sample surveys, censuses and other means of making estimates within each country. (Sources are described in detail on the Laborsta database.) The data may not be perfectly comparable across countries. By comparison, data on attainments is likely to be a more accurate, consistent and coherent measure of formal schooling over time. Thus there are several weak points in the data used in the regressions of which the employment-rate data is a major one.

Complementing both interpretations is the possibility that factors in Sub-Saharan African countries have radically changed the causal configurations that explain growth in the recent period (UNDP 2005). In descriptive statistics for 2002, the levels of women's empowerment in some Sub-Saharan African countries appeared as a high outlier on graphs of regional average attainment and the Human Development Indicator. *(See appendix Figures 5 and 6. The schooling attainments of women in Sub-Saharan Africa appear to be above the main line of best fit of the rest of the world. The proportion of parliament that is female is also above what would be expected, given the Human Development Index level, in many Sub-Saharan African countries.) Whereas its poverty levels would tend to imply low levels of women's empowerment (and low percentages of parliament that are female), the actual data for some Sub-Saharan African countries deviate upward from this expectation. Causal models of the female percentage of parliament have used GDP per capita and female literacy rates or education as explanatory factors (Paxton, et al., 2003; Kenworthy and Malami, 1999; Paxton and Kunovitch, 2003).*

The situation in most of Sub-Saharan Africa is dire, yet it is also rather better than might be expected as far as women's education goes. (This phrase 'rather better' depends on comparing individual countries with a line of best fit across all countries.) the results suggest that raising women's education levels in Sub-Saharan Africa would have a noticeable effect on these countries growth rates, *ceteris paribus.* The growth *rates* in these countries have been low (Table 5). The UNDP suggests that the HIV virus and associated morbidity have had a noticeable negative impact on GDP levels (UNDP, 2005). Cross-sectional statistical tests using a dummy for the level of HIV infection (0 for low, and 1 for levels of 5% or greater of the population, which 18 countries had reached in 2002) were not conclusive. No statistical significance was found. Nevertheless it is important to decide whether the first or second interpretation of the emerging pattern is correct.

The evidence makes me favour the second interpretation. Gendering employment in the Barro model improves the model and would cause us to revise our interpretations of the older Barro estimates. The results are not different merely because of the inclusion of 2002 data. Gendering part of the model also made it reasonable to test for gender-differentiated effects in the rest of the model. For educational

attainments and for public political democracy there was no evidence of a gender-specific association. The results in the main economic part of the model were quite stable whilst these other tests were being carried out.

The role of fertility has disappeared. Tests were also run with and without population growth rates. It made little difference whether these demographic factors were included. Demography matters very much because it influences the employment rates and the economic activity rates. These rates must be calculated carefully. If the people over 64 are excluded from the denominator but are often working – as in many low-income countries – economic activity rates will typically exceed 100%. After all, many children are economically active but the workforce is considered (here, and elsewhere) to include only those of age 15 or 16 and over. High economic activity rates were observed in some poor countries which have low GDP per capita.

The results suggest that gender-blind research needs much improvement to make it gender-sensitive. Indicators are available for serious analysis of secondary data on gender and economic growth. The strengths and weaknesses of specific indicators have made the analysis rather more narrow and focused than one might wish. Future research could attempt to explore the links over time and between generations between education policy, educational attainments, labour force participation and growth. So far we found that whilst human capital matters to growth, there are particular gender differences that matter especially. More research along these lines is called for.

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Table 1: Average Levels of Growth, Educational Attainment and Other Factors, 2002

	Mean (N=73)	Mean (All Countries)	Standard Deviation (All Countries)	Units
GDP Per Capita	7.62	7.5	1.59	Logged, US$1995
Investment	21.7	22.1	9.21	Percent of GDP
Attainment	5.6	6.1	2.84	Years of Schooling
Fertility (Log)	1.15	1.01	.512	Births Per Woman
FDI	7.9	16.7	28.4	Percent of GDP
Pop. Growth	1.7	1.4	1.11	Annual Rate
Economic Activity Rate	.66	.69	.117	Percent of Population in Labour Force
Trade	67.4	84	41.5	Exports and Imports as Percent of GDP
Democracy	4.9	4.6	1.97	Average of Two Scales Each 1-7
Attainment, F/M Ratio	.80	.83	.199	Ratio of Female to Male Years of Schooling
Women in Parliament	11.7	13.4	9.70	Percent of Total in Lower House
Women in Labour Force	34.3	36.8	10.39	Percent of Total Labour Force

Sources: See Appendix 2.

Table 2: Change Over Time in Levels of Income, Education, Employment, Democracy and Other Factors, 1972-2002

	Mean (All Countries)				
	1972	1982	1992	2002	All Years
GDP Per Capita	7.3	7.4	7.4	7.5	7.4
Investment	21.0	25.1	22.4	22.1	22.7
Attainment	4.0	4.7	5.4	6.1	5.1
Fertility (Log)	1.5	1.4	1.2	1.0	1.3
FDI	5.1	4.2	9.2	16.7	9.5
Pop. Growth	2.2	2.1	1.8	1.4	1.9
Economic Activity Rate	.66	.66	.66	.69	.67
Trade	53.7	71.9	76.3	84.4	73.1
Democracy	3.7	3.8	4.4	4.6	4.1
Attainment, F/M Ratio	.71	.75	.79	6.1	.77
Women in Parliament	6.1	9.2	9.0	13.4	9.9
Women in the Labour Force	30.4	32.6	34.4	36.8	33.6

Sources: See Appendix 2.

Table 3: Factors Associated With Growth in Per-Capita Income Over 1972-2002

	Growth Models		Acceleration Models		Endogenous Variable
Dependent Variable	Log of Per-Capita GDP	Log of Per-Capita GDP	Growth Rate of Per-Capita GDP	Growth Rate of Per-Capita GDP	Investment Ratio (Percent of GDP)
Column no.	(1)	(2)	(3)	(4)	(5)
Estimation Method	Fixed Effects	Random Effects	Fixed Effects	Random Effects	Fixed Effects
Investment	.006(.003)**	.008(.003) **	.208(.047)***	.157(.028)***	nim
Attainment	.093(.039)**	.309(.032)***	-.982(.591)*	-.29(.128)**	-1.37(.964)
Fertility (Log)	-.029(.162)	-.734(.173)***	-2.577(2.46)	-2.74(1.07)**	-2.76(3.96)
FDI	-.002(.001)	-.002(.002)	.074(.023)***	.024(.018)	-.007(.041)
Economic Activity Rate	.167(.281)	-.397(.311)	2.900(4.268)	1.73(1.69)	Nim
Trade	nim	Nim	nim	nim	.056(.025)**
Lagged GDP per capita	nim	nim	nim	nim	-5.08(1.95)***
Significance of Whole Estimate	<1% ***	<1% ***	<1% ***	3% **	F of regression 4.14 with 7 and 156 d.f.
Wald Chi-Squared	365361	299.8	65.54	15.31	
R-Squared Overall	.62	.82	.13	.21	.001
Number	84	84	84	84	94

Columns 1 to 4 have investment as the endogenous variable in a generalised least squares instrumental variables fixed-effects estimate. Investment is considered to be endogenous. Trade, logged GDP in 1982, and lagged gdp per capita have been used as instruments in two-stage least squares regression in these columns. Controls for year and population growth rates were put in all equations.

Note: *** means <1% significance, ** means <5% significance, and * means <10% significance. Figures in brackets are standard errors. NIM = not in model.

Table 4: Gendered Growth Outcomes and Gender-Sensitive Educational Attainments

Estimation Method	Fixed Effects	Fixed Effects
Investment	.006(.003)*	.004(.003)
Attainment	.092(.039)**	nim
Fertility (Log)	-.054(.170)	-.123(.171)
FDI	-.002(.002)	-.002(.002)
Economic Activity Rate	.182(.283)	.194(.288)
Attainment Ratio (Female to Male Percent)	-.139(.287)	-.167(.291)
Significance of Whole Estimate	<1% ***	<1% ***
Wald Chi-Squared	13594	350478

R-Squared Overall	.60	.003
N	84	84

Columns 1 to 4 have investment as the endogenous variable in a generalised least squares instrumental variables fixed-effects estimate. Investment is considered to be endogenous. Trade, logged GDP in 1982, and lagged gdp per capita have been used as instruments in two-stage least squares regression in these columns. Controls for year and population growth rates were put in all equations. The dependent variable is the log of GDP per capita in constant US$.

Note: *** means <1% significance, ** means <5% significance, and * means <10% significance. Figures in brackets are standard errors. NIM = not in model.

Table 5: GDP Per Capita and Growth in Seven World Regions

Overall Averages 1972-2002	Growth rate *	Log of GDP per capita in US %	Ratio of female to male schooling	Average Years of Schooling	Women as a % of the Labour Force
Sub-Saharan Africa	-0.79	6.02	0.66	3.08	38.85
Middle East	3.24	7.82	0.70	5.63	21.77
Asia and Pacific	3.03	6.70	0.69	4.84	36.17
Latin Amer. & Caribbean	-0.78	7.63	0.96	5.36	24.77
Eastern Europe	1.24	8.31	0.91	9.04	39.91
Scandinavia	0.26	10.1	0.95	9.42	47.34
Other OECD Etc.	0.61	9.72	0.92	8.72	35.32
Total	0.53	7.63	0.80	5.63	34.27

Averages for 2002 Decadal Time-Point Only	Growth rate * 1999-2003	Log of GDP per capita in US %	Ratio of female to male schooling	Average Years of Schooling	Women as a % of the Labour Force
Sub-Saharan Africa	1.25	6.11	0.72	3.68	38.05
Middle East	2.06	7.79	0.76	6.25	23.4
Asia and Pacific	2.45	6.70	0.72	5.37	38.27
Latin Amer. & Caribbean	-0.79	7.78	0.96	6.08	28.61
Eastern Europe	3.60	8.50	0.91	9.13	40.91
Scandinavia	0.79	10.31	0.97	10.35	49.78
Other OECD Etc.	1.08	9.98	0.93	9.46	39.69
Total	1.04	7.65	0.83	6.13	35.85

Note: The growth rate shown is the unweighted average of the four per-capita growth rates of GDP in US$ 1969-73, 1979-83, 1989-93, and 1999-2003. See Appendix for details.

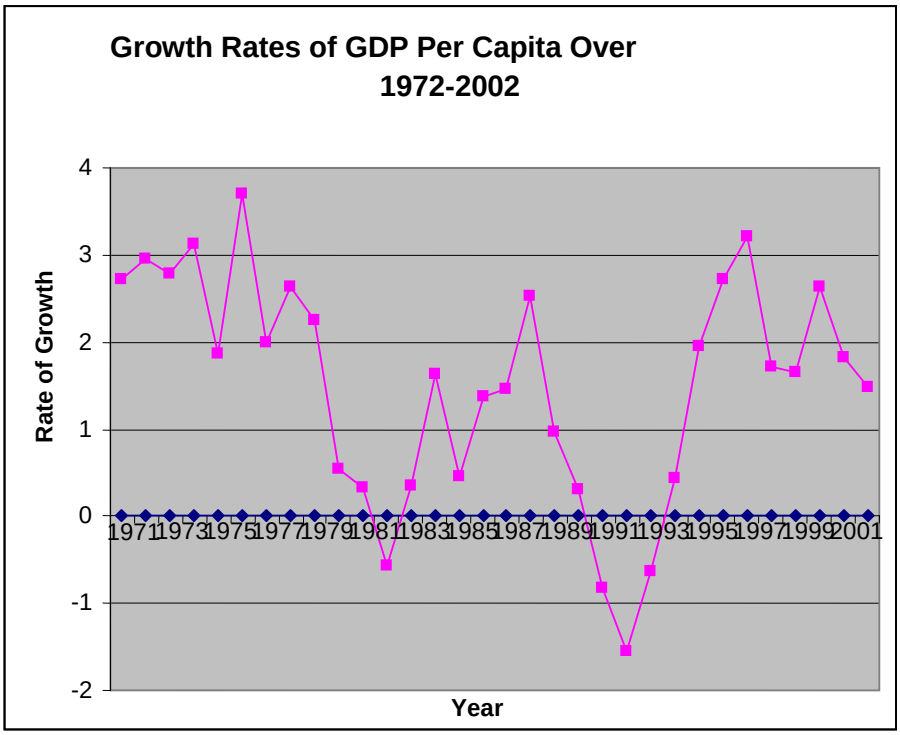
Table 6: Gendered Growth Outcomes and a Gender-Sensitive Employment Measure

Estimation Method	**Fixed Effects**	Fixed Effects	Fixed Effects
Column no.	**(1)**	(2)	(3)
Investment	**.006(.003) ** **	.008(.002) ***	.006(.003) **
Attainment	**.078(.039) ** **	.072(.034) **	.068(.040) *
Fertility (Log)	**.026(.154)**	.071(.145)	-.039(.159)
FDI	**-.002(.001)**	-.002(.001)	-.002(.002)
Economic Activity Rate	**.064(.271)**	nim	.230(.278)
Women in Labour Force	**.021(.006) *** **	.014(.006) **	Nim
Democracy	**-.176(.081) ** **	-.166(.070) **	-.231(.081) ***
Democracy Squared	**.024(.010) ** **	.020 (.008) **	.029(.010) ***
Significance of Whole Estimate	**<1% *** **	<1% ***	<1% ***
Wald Chi-Squared	**407177**	453594	379484
R-Squared Overall	**.45**	.36	.66
N	**83**	93	84

Columns 1 to 4 have investment as the endogenous variable in a generalised least squares instrumental variables fixed-effects estimate. Investment is considered to be endogenous. Trade, logged GDP in 1982, and lagged gdp per capita have been used as instruments in two-stage least squares regression in these columns. Controls for year and population growth rates were put in all equations. The dependent variable is the log of GDP per capita in constant US$.

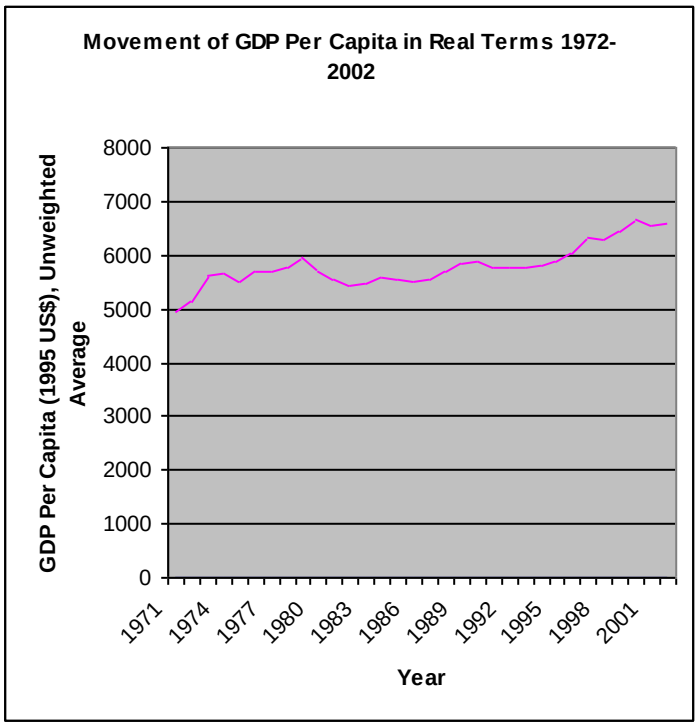
Note: *** means <1% significance, ** means <5% significance, and * means <10% significance. Figures in brackets are standard errors. Column 1 (bold) indicates the regression used for Figures 3 and 4. NIM = not in model.

Figure 1: Movement of the Growth-Rate of Countries, Annual Rates, Over Time



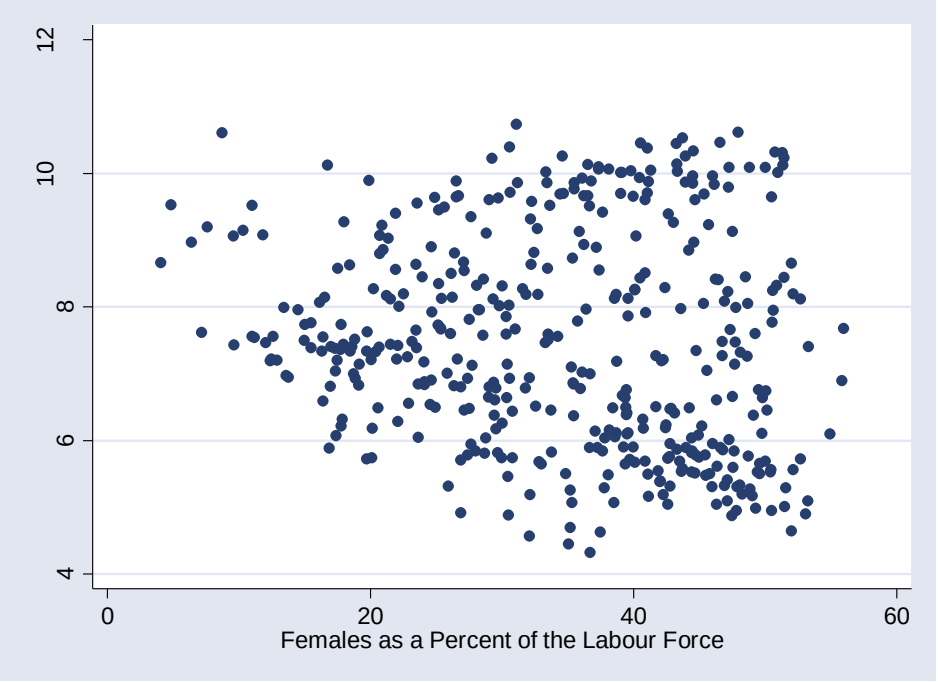
Source: World Development Indicators 2004 CD Rom. They are the annual percentage growth of GDP per capita in 1995 (constant) US dollars, as reported in WDI for each year; unweighted averages.

Figure 2: Movement of the Level of Per-Capita Income in Real Terms Over Time



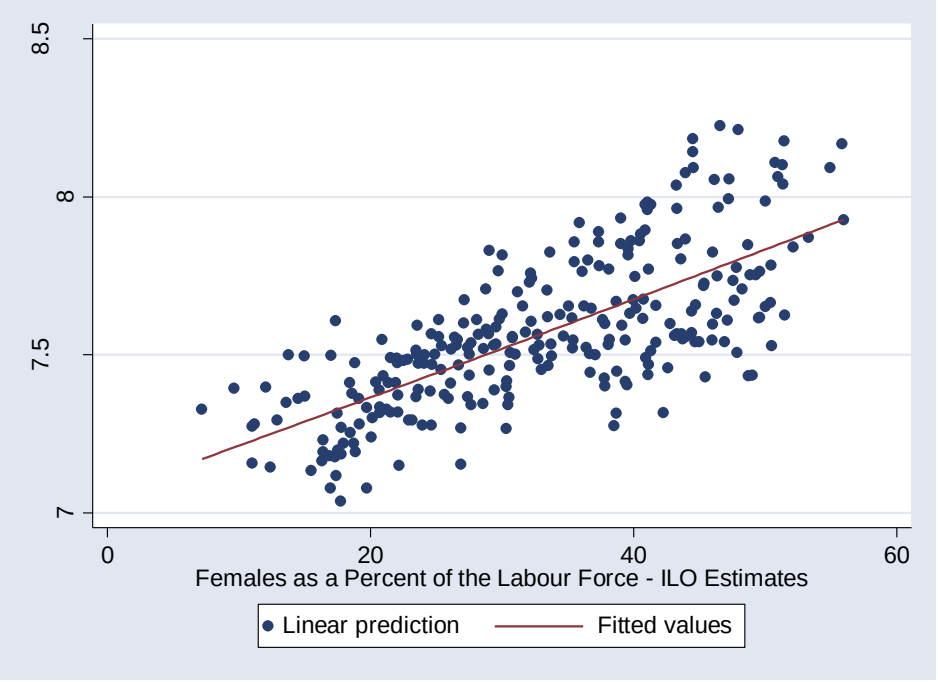
Source: World Development Indicators 2004 CD ROM, all available countries; unweighted average.

Figure 3: GDP's Gross Association with Women as a Percentage of the Labour Force, Raw Data, 1982-2002



Source: WDI. The actual values of logarithm of GDP per capita (in real

Figure 4: Net Effect of Women as a Percentage of the Labour Force on GDP, 1982-2002



Source: the predictions from Table 6, Column 1, are graphed using the time-points 1982, 1992, and 2002.

Appendix 1: The Countries Included in the Regression in Table 6 (Column 1)

Argentina	**Malawi**
Australia	**Malaysia**
Austria	**Mali**
Bangladesh	**Mauritius**
Benin	**Mexico**
Bolivia	**Mozambique**
Botswana	**Nepal**
Brazil	**Netherlands**
Cameroon	**New Zealand**
Central African Republic	**Norway**
Chile	**Pakistan**
China	**Panama**
Colombia	**Paraguay**
Congo	**Philippines**
Dem. Rep. of the Congo	**Rwanda**
Costa Rica	**Senegal**
Denmark	**Sierra Leone**
Dominican Republic	**South Africa**
Ecuador	**Spain**
Egypt	**Sri Lanka**
Finland	**Sudan**
France	**Swaziland**
Gambia	**Sweden**
Germany	**Switzerland**
Ghana	**Syrian Arab Republic**
Greece	**Thailand**
Guatemala	**Togo**
Guyana	**Turkey**
Honduras	**United Kingdom**
Hungary	**United States**
Iceland	**Zambia**
India	**Zimbabwe**
Indonesia	
Islamic Rep. of Iran	
Israel	
Italy	
Jamaica	
Jordan	
Kenya	
Lesotho	

Appendix 2: Data Sources

Name	Label	Definition	Source
Country		Country name within United Nations system	
Year		Decadal time points 2002, 1992, 1982 and 1972	
LogGDPpcPPP	Log of GDP per capita PPP	Logarithm of gross domestic product per capita using Purchasing Power Per Capita US dollars.	WDI
LogGDPpc	Log of GDP per capita in constant US$	Logarithm of gross domestic product per capita using 1995 US dollars.	WDI
Growth	Rate of growth of per-capita domestic product	Annual growth rate of per-capita gross domestic product using 1995 US dollars, calculated as an overall rate over four years surrounding the dates 1982, 1992, 2002. The dates are 1979-83, 1989-93, 1999-2003.	WDI
Gcap	Gross capital formation (% GDP)	Gross capital invested as a % of domestic product	WDI
Trade	Trade (% of GDP)	Exports plus imports as % of GDP	WDI
FDI	Foreign Direct Investment	Foreign Direct Investment	WDI
EcActiv	Economic Activity Rate of those aged 15+	Those in occupations as a percentage of the workforce of the working age group ages 15+. Calculated using WDI labour force size divided by the working age population. The latter is total population minus the population aged 0-14 years, ie the age 15+ population. For the UK, the ILO Laborsta figures are used.	WDI**, "all people who supply labor for the production of goods and services, including both the employed and the unemployed."
EcActivILO	ILO Activity Rate of those aged 15+	Those in occupations as a percentage of the workforce of the working age group ages 15+	ILO Laborsta: the number employed (ISCO) divided by the working-age

			population.
ILOlfPF – This is the variable used in Tables 3-6.	ILO Projected Percentage of the Labour Force Which is Female	ILO Projections and Estimates of the proportion of the workforce that is female. 5-year period centres are used including 1970 (here labelled as 1972), 1980 (here 1982), 1990 (here 1992), and 2000 (here shown as 2002)	UNCDB, originally from ILO, UNCDB code 4270, averaged across 13 age groups
Profmanf	Professional and managerial workers, % female	The percentage of professionals and technicians and managers that are female. (ISCO 1968 0/1 and 2; ISCO1988 1 and 2 and 3)	ILO Laborsta
AttainFM	Gender Ratio in Educational Attainment	Ratio of female to male average attainment estimated by Barro and Lee in years, ages 15+	Barro and Lee
Attain	Educational Attainment (Years)	Average Attainment estimated by Barro and Lee in years, for people aged 15+	Barro and Lee
ParliamtF	Women in Parliament, % of Total	Percentage of parliamentary seats held by women. Where there are two houses, the lower house is chosen.	Inter-Parliamentary Union (2005)
Polrghts	Political Rights	Political rights on a scale of 1 to 7, where 7 is the most rights.	FreedomHouse
Civillibs	Civil Liberties	Civil liberties on a scale of 1 to 7, where 7 is the most liberties.	FreedomHouse
Democ	Democracy, Average of 2 Gastil Scales	Average of the above political rights scale and civil liberties scales	As used by Barro
Fertility	Fertility	Average births per woman	WDI
Logfertility	Log of Fertility		WDI (derived)
Popgrow	Population Growth Rate (Percent)	Annual percentage growth rate of population	WDI

Sources

Barro and Lee:
Barro, R. J. and J.-W. Lee (2001). "International Data on Educational Attainment: Updates and Implications." *Oxford Economic Papers* 3: 541-563. See also: Barro, Robert, and Jong-Wha Lee (2000) "International Data on Educational Attainment: Updates and Implications", working paper, Harvard CID, available online. Data accessed at: http://www.cid.harvard.edu/ciddata/ciddata.html, last accessed June 20, 2005.

Freedom House:
Freedom House (2004) *Annual Survey of Freedom Country Ratings.* www.freedomhouse.org/ratings/

ILO Laborsta:
ILO Bureau of Statistics (2004). LABORSTA Internet, International Labour Office. Available from: laborsta.ilo.org [accessed December 2004].

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Inter-Parliamentary Union (1995) *Women in Parliaments: 1945-1995*. (Geneva: Inter-Parliamentary Union).
Inter-Parliamentary Union (2005) *Women in National Parliaments*. http://www.ipu.org/wmn-e/world-arc.htm (see also: Inter-Parliamentary Union (2005) *Parline Data Base*. Accessed at: http://www.ipu.org/parline-e/parlinesearch.asp for details of quotas).

WDI:
World Bank (2005) *World Development Indicators 2005*. Accessed at: http://esds.mcc.ac.uk/WDS_WB/TableViewer/dimView.aspx?ReportId=29 courtesy of Economic and Social Data Service. **The WDI 2004 CD ROM was used for overall labour force participation.

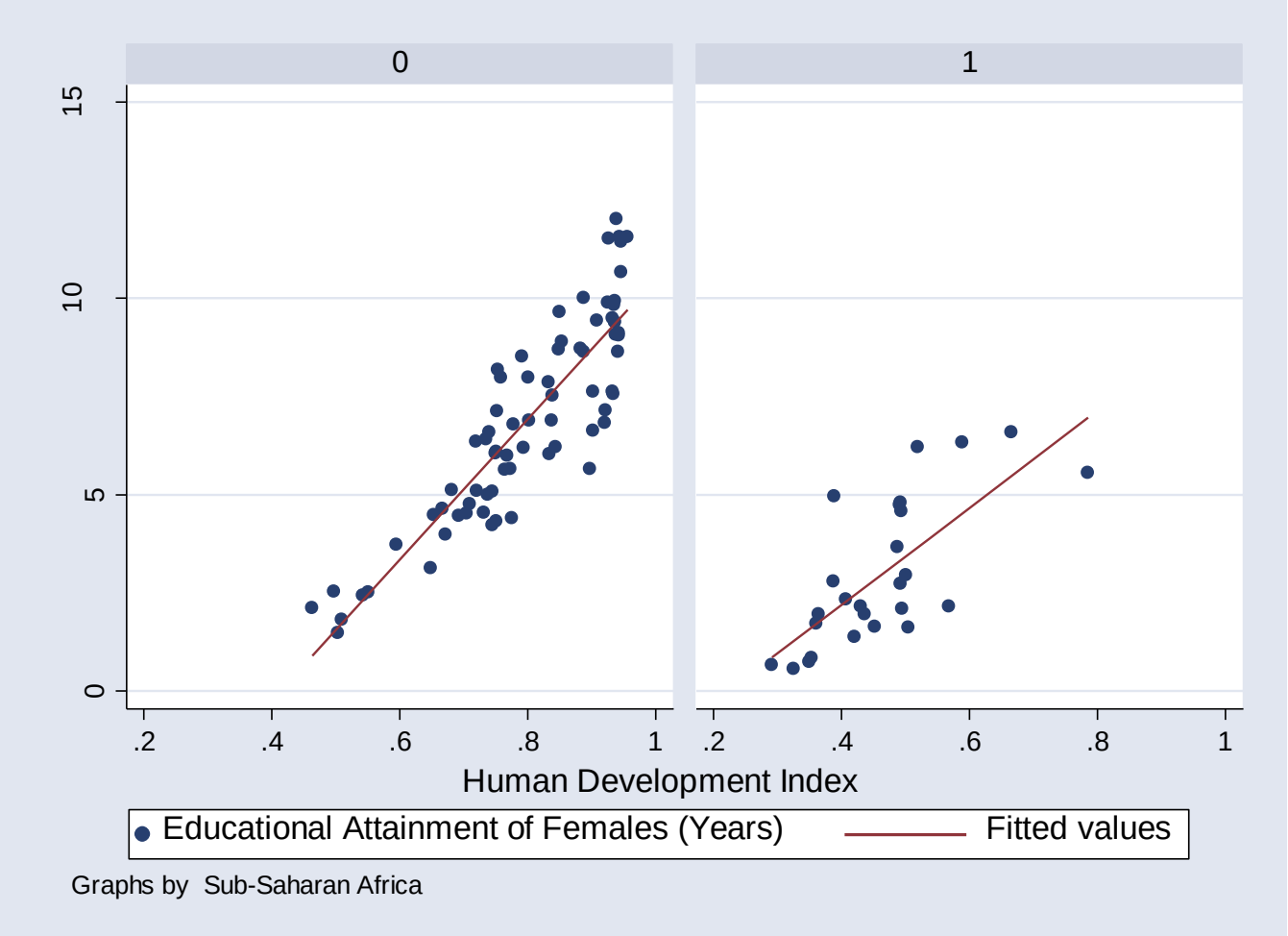
Appendix Table 7: Gendered Growth Outcomes and Gender-Sensitive Democracy Measure

Estimation Method	Fixed Effects	Fixed Effects	Fixed Effects
Investment	.006(.003) **	.007(.003) **	.006(.003) **
Attainment	.067(.039)*	.127(.040)***	.093(.037) **
Fertility (Log)	-.057(.167)	.209(.169)	.178(.157)
FDI	-.002(.002)	-.002(.002)	-.002(.002)
Economic Activity Rate	.239(.279)	-.194(.252)	-.131(.244)
Attainment Ratio (Female to Male Percent)	-.101(.284)	.220(.265)	.200(.261)
Democracy	-.231(.081) ***	Nim	-.172(.079) **
Democracy Squared	.029(.010) ***	nim	.019(.009) **
Women in Parliament	Nim	.002(.007)	-.001(.003)
Women in Parliament Squared	Nim	-.000(.000)	Nim
Significance of Whole Estimate	<1% ***	<1% ***	<1% ***
Wald Chi-Squared	376792	15051	519073
R-Squared Overall	.65	.63	.61
N	84	79	79

Columns 1 to 4 have investment as the endogenous variable in a generalised least squares instrumental variables fixed-effects estimate. Investment is considered to be endogenous. Trade, logged GDP in 1982, and lagged gdp per capita have been used as instruments in two-stage least squares regression in these columns. Controls for year and population growth rates were put in all equations. The dependent variable is the log of GDP per capita in constant US$.

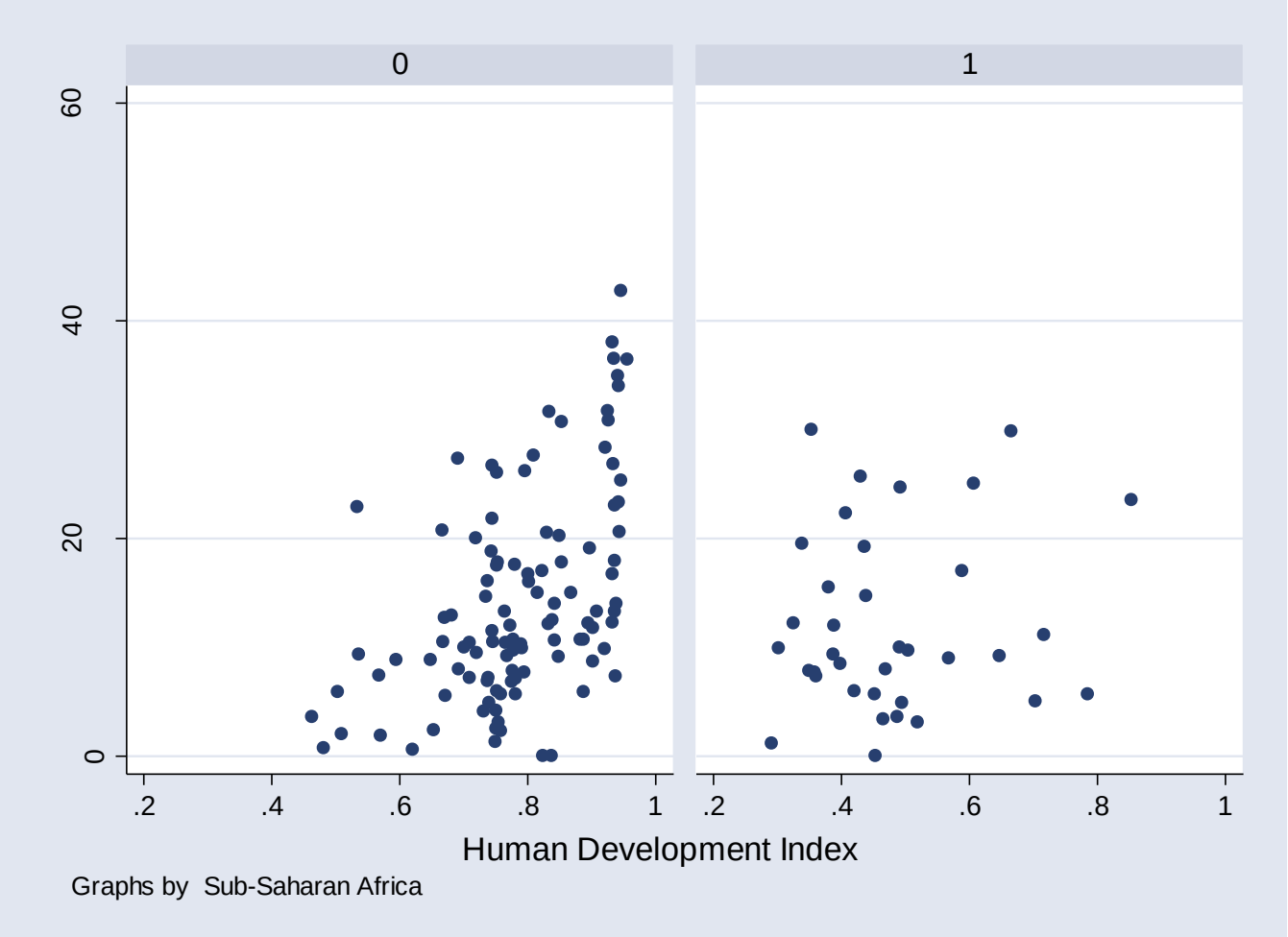
Note: *** means <1% significance, ** means <5% significance, and * means <10% significance. Figures in brackets are standard errors.

Figure 5 Women's Schooling Attainments Vs. Human Development Index, 2002



Sources: See appendix. Data for 2002 only. The left-hand figure shows data for the whole world except Sub-Saharan Africa, subject to data availability, and the right-hand figure is for Sub-Saharan Africa only.

Figure 6 Female Proportion in Parliament Vs. Human Development Index, 2002



Sources: See appendix. Data for 2002 only. The left-hand figure shows data for the whole world except Sub-Saharan Africa, subject to data availability, and the right-hand figure is for Sub-Saharan Africa only.