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Naila Kabeer and Luisa Natali

Summary

To what extent does gender equality contribute to economic growth? And to what extent does the reverse relationship hold true? There are a growing number of studies exploring these relationships, generally using cross-country regression analysis. They are characterised by varying degrees of methodological rigour to take account of the problems associated with econometric analysis at this highly aggregated level, including the problems of reverse causality. Bearing these problems in mind, a review of this literature suggests that the relationship between gender equality and economic growth is an asymmetrical one. The evidence that gender equality, particularly in education and employment, contributes to economic growth is far more consistent and robust than the relationship that economic growth contributes to gender equality in terms of health, wellbeing and rights. From a growth perspective, therefore, the promotion of certain dimensions of gender equality may appear to offer a win-win solution but from a gender equity perspective, there is no guarantee that growth on its own will address critical dimensions of gender equality. Either growth strategies would need to be reformulated to be more inclusive in their impacts or redistributive measures would need to be put in place to ensure that men and women benefit more equally from growth.

Keywords: Gender equality, Economic growth, development, cross-country regression analysis

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Introduction

...investing in women is not only the right thing to do. It is the smart thing to do. I am deeply convinced that, in women, the world has at its disposal, the most significant and yet largely untapped potential for development and peace. Ban Ki Moon

Ban Ki Moon, UN Secretary General

www.iheu.org, (International Humanist and Ethical Union), 8 March 2008

Advocacy within the field of gender and development has been broadly summarised under two sets of arguments, both touched on in the opening quote from Ban Ki Moon. The first set of arguments points to the adverse implications of gender inequality in the distribution of valued resources and opportunities for women's well-being, agency and human rights. It argues for gender equality on intrinsic grounds, as a valued goal in itself, an essential aspect of human dignity and social justice, ('the right thing to do'). The second set offers an instrumental rationale which rests on well-documented evidence that increasing gender equality in valued resources and opportunities is an effective means to the achievement of other development goals ('the smart thing to do').

As a number of feminist scholars have argued, it has been the instrumental arguments that have made most headway within the mainstream development agencies (Jackson 1996; Kabeer 2008; Pearson 2005; Razavi 1997). While well-documented evidence on gender discrimination in access to jobs, education, health, political representation and so on all testify to the persistence of gender inequalities in life choices and life chances (summarised for instance in the UNDP's Gender Inequality Index, the World Economic Forum's Global Gender Gap Index and the OECD's Social Institutions and Gender Index), it is the equally compelling evidence that women's access to jobs, cash transfers, education, credit, land and other assets has positive implications for poverty reduction, fertility decline, children's welfare and agricultural productivity (see, for instance, Barrientos and DeJong 2006; Blumberg 2005; Kabeer 2003; Quisumbing 2003) that has received most attention in international policy forums.

As Lawrence Summers put it in 1992, in his capacity as World Bank chief economist, 'Investment in girls' education may well be the highest return investment available in the developing world' (cited in Murphy 2009: 5). The same theme was picked up again in the World Bank Group Gender Action Plan (2007: 2): '...the business case for expanding women's economic opportunities is becoming increasingly evident: this is nothing more than smart economics'.

Much of the early evidence for the 'smart economics' arguments was generated by studies of local-level programmes and projects which showed the emergence of 'productivity gaps' as a result of gender-biased provision of income-generating activities, credit, irrigation, agricultural extension, and so on (eg. Boserup 1970; Buvinic 1986; Dey 1981; Staudt 1978). The focus changed with the ascendance of neo-liberal ideas within the development community. Research attention turned to the gender implications of macro-economic policies seeking to promote economic growth through downsizing the role of the state, the promotion of market forces and the opening up of economies to global competition. The first wave of these studies remained at the micro-level, documenting gender differences in household and farm responses to market incentives, economic crisis and cut-backs in public expenditure.

Both instrumental and intrinsic arguments played out in this body of research. The instrumental case rested on evidence, much of it from the agricultural sector, that gender

inequality in the intra-household distribution of roles, resources and incentives inhibited the supply response to market signals (Collier 1993; Haddad *et al.* 1995; Palmer 1991; Wold 1997). Intrinsic arguments noted that the macro-economic reforms of the period had a particularly adverse impact on women, cutting back on public services that had supported their reproductive roles while requiring them to increase their productive efforts in response to market incentives and declining male incomes (Elson 1991; Moser 1989; Sparr 1994). More recently, Duflo (2012) has brought together some of the intrinsic and instrumental evidence relating to the relationship between women's empowerment and development, also drawing on a range of micro-level evidence.

However, given the central place given to economic growth within the neo-liberal paradigm, there has been growing interest in the macro-level relationship between economic growth and gender equality. Once again, we can make a broad distinction between studies that have taken the instrumental approach, focusing on the contribution of gender equality to economic growth and others which have reversed the question and explored the implications of economic growth for gender equality. It is these two bodies of literature that are the main focus of this paper.

The policy implications of these studies will clearly vary according to their findings. If gender equality is found to make a distinct contribution to economic growth, there is clearly a strong instrumental rationale for its promotion, giving gender equality advocates a more receptive audience among mainstream policymakers. If, on the other hand, gender equality is not found to add a great deal to growth, the 'win-win' argument for gender equality is weakened, although the intrinsic case remains. Taking the reverse relationship, if economic growth is found to contribute to gender equality, then the pursuit of economic growth on its own can be relied on to bring about a more equitable development. If, on the other hand, economic growth has little or no bearing on gender inequality, or has a negative impact, then growth strategies would have to be reformulated along more equitable lines and/or additional measures put in place to ensure a more equitable distribution of the fruits of growth.

In this paper, we review the evidence for both sets of relationships: the impact of gender equality on economic growth and the impact of economic growth on gender equality. We draw primarily on literature identified in the course of a search carried between October-December 2011, but have added a number of more recent papers identified by external reviewers. While we do not offer a comprehensive review of the relevant literature, we have included all the most prominent studies published during this period. The studies vary considerably in the countries included, in the time periods covered, in the key variables used and how they are defined. Much of the literature reviewed uses highly aggregated cross-country regression analysis but there are also a number that use country level data. Because of the interest in the impact of neo-liberal policies on both growth and gender equality, many of these studies include direct and indirect measures of such policies, such as openness to trade, public expenditure and interest rates. Appendix A contains a bibliographic matrix of the studies discussed in the paper: it summarises the questions explored, methodologies used, time periods and countries covered and basic findings.¹

There are, of course, widely acknowledged problems with this genre of cross-country regression analysis.² A detailed discussion of some of these problems can be found in Rodriguez and Rodrik (2001) and Levine and Renelt (1992), but here we touch on two key ones. The first relates to the problem of establishing causation on the basis of correlation: does the observed correlation between economic growth and its hypothesised determinants

¹ The matrix also includes a number of relevant studies which are not discussed in the paper but can serve as additional bibliographic resources.

² Among the methodological flaws common in cross-country growth regressions are parameter heterogeneity, omitted variables (or unobservable heterogeneity), endogeneity, outliers, model uncertainty and measurement error. Many of these problems are related to the incorrect treatment of country specific effects.

reflect a causal relationship or the effect of other unobserved variables which are correlated with these determinants? The second is the problem of reverse causality: does an observed relationship between gender equality and growth reflect the impact of gender equality on growth or growth on gender equality or are they mutually reinforcing? As Knowles *et al.* (2002: 143) point out in relation to such studies: 'any conclusion must be tempered by acknowledging that disentangling patterns of significance and causation from highly collinear, interrelated cross-country data of varying quality is fraught with difficulties'. The more careful studies take measures to correct for these problems - and these are reported in the bibliographic matrix - but many do not. Given the acknowledged methodological problems of carrying out regression analysis at this highly aggregated level, the findings discussed in this paper should be taken as suggestive evidence about the nature of the relationship between gender equality and economic growth rather than definitive proof of causality. As such, they constitute a useful point of departure for more detailed analysis of these regularities on the basis of country case studies that draw on more historically located and locally contextualised data.

1 Does gender equality contribute to economic growth?

There is a long-established tradition of estimating growth models within the economics discipline. Early models took labour as a 'given' factor of production, exogenously determined by rates of population growth. There was very little scope for exploring the human, let alone the gender, dimensions of growth in these models (Walters 1995). This changed with the rise of endogenous growth theory and the greater prominence given to the accumulation of human capital in driving growth rates. As a logical extension of this, a number of studies have included gender disaggregated versions of human capital, largely proxied by gender differences in educational attainment, in their models. Interest in the impact of other aspects of gender inequality – labour force participation and wages - on growth is more scattered.

Empirical growth models typically rely on *changes* in per capita GDP as their measure of economic growth although a number rely on *levels* of per capita income. As Hall and Jones (1999: 114) point out, the results from both are relevant because 'many of the predictions of growth theory can be successfully considered in a cross section context by examining the levels of income across countries'. The independent variables of these studies include a number of those that have been established as significant in the growth literature: initial per capita GDP to account for a conditional convergence mechanism or the catch up effect (namely the hypothesis that poorer countries – starting from a lower starting level of per capita income – grow more rapidly than wealthier ones),³ fertility rates/population growth and life expectancy to capture labour supply and levels of health; investment rates; human capital; various measures of the macro-economic environment, such as government expenditure, 'openness to trade' (e.g. ratio of imports and exports to GDP), the black market premium on foreign exchange, the rule of law and dummy variables for conflict during the period of study.

Klasen (1999) has spelt out some of the direct and indirect pathways through which greater gender inequality in the use of human resource in an economy is likely to impact on 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 resources. If ability and talents are assumed to be evenly distributed by gender, then the failure to educate

³ Empirically convergence exists if the coefficient on initial per capita income is negative.

and make use of women's ability and talent to the same extent as that of men represents market distortion, an artificial restriction on the pool of talent available in an economy, lowering the average productivity of its human capital (the 'selection-distortion effect').

A second pathway is largely mediated by family relations. It relates to the positive externalities generated by greater gender equality on household decisions relating to human capital determinants of growth. If women's access to education and economic opportunities is more likely to lead to greater investments in the human capital of their children, as suggested by a considerable body of micro-level evidence, some of it cited earlier, then it improves the productivity of the next generation of workers, a somewhat longer term impact. Higher levels of female education – and labour force participation – have also been found to be a major factor in bringing about fertility decline which in turn reduces the dependency burden in the economy 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.

However, a number of authors have pointed out that there may be circumstances under which gender *inequalities* of certain kinds can contribute positively to the pace of growth (Blecker and Seguino 2002; Ertürk and Cağatay 1995; Standing 1999). They suggest that less developed countries characterised by manufacture of high labour-intensive and price-elastic goods for export might benefit from gender discrimination in wages if cheap, but productive, female labour can boost their price competitiveness by lowering unit labour costs and attracting investment. As Braunstein (2012: 15) puts it: 'when gender discrimination is manifested in ways that do not compromise the overall quality of the labour force but merely lower the cost of labour for employers, systematically discriminating against women can have positive effects on growth'.

1.1 Gender, education and economic growth

The early cross-country growth studies that included gender-disaggregated measures of education were largely pessimistic about the impact of gender equality. In their widely cited paper, Barro and Lee (1994) used a panel data set for 1965-1975 and 1975-1985 for 138 countries to explore the determinants of growth in GDP. Female and male secondary attainment were included as separate independent variables. The coefficient on female education was found to be negatively related to growth whereas the one on male education was found to be positive. The authors suggested that this 'puzzling finding' was a 'measurement' or 'omitted variable' problem. Large gender gaps in education were interpreted as capturing aspects of 'backwardness' not captured by initial per capita GDP and hence likely to be associated with lower economic growth.

Building on the Barro and Lee model, Barro and Sala-i-Martin (1995) included four separate education variables: higher and secondary education for males as well as females. Their findings provided further support for a negative association between female education and economic growth. Perotti (1996) also found male education to be positively related to economic growth, while the coefficients on female education was significantly negative; the explanations provided followed Barro and Lee (1994). One exception among these initial studies was Caselli *et al.* (1996); they re-estimated Barro and Lee (1994) and obtained significant positive and negative coefficients on female and male education respectively.

These early studies, and Barro and Lee (1994) in particular, have been challenged on methodological grounds. First of all, it was shown that results were influenced by specification problems and the resulting multicollinearity. As male and female schooling are closely correlated ($\rho > 0.9$ in Barro and Lee, 1994), it was not easy to distinguish their

individual effects. The multicollinearity hypothesis was further supported by the presence of large standard errors for male and female schooling as well as the reversal of the findings in different specifications (Forbes 2000; Klasen 1999; Klasen 2002; Knowles *et al.* 2002; Lorgelly and Owen 1999).

Secondly Stokey (1994) noted that the female education variable became insignificant when regional dummies were added: it appeared that the female variable was capturing the effect of regions and ethnic groups that educated women differently from men. She argued that the four East Asian tiger countries (Hong Kong, Singapore, Taiwan and Korea) were such a group: the combination of very high initial gender inequality in education and low levels of female schooling and very high subsequent levels of growth that characterized these countries were driving the Barro and Lee results. Lorgelly and Owen (1999) tested the empirical validity of this suggestion. They found that the four East Asian tigers were indeed influencing the finding of a negative coefficient on female education. They also highlighted the influence of a few Sub-Saharan African (SSA) country outliers (such as Uganda, Rwanda, Liberia and Zaire). Excluding these influential observations reduced the significance of both male and female educational coefficients.

A similar point was made by Dollar and Gatti (1999); they suggested that Latin American countries characterised by high initial levels of female education combined with low initial levels of gender equality in education and subsequent low levels of growth could also be biasing the Barro and Lee's findings. Inclusion of regional dummies was therefore necessary to capture region-specific factors other than gender inequality. Finally, it was pointed out that these early studies had not taken into account the endogeneity of the male and female education variables (Klasen and Lamanna 2009).

An alternative stream of studies, many using more advanced econometric techniques, came up with a far more positive set of findings relating to female education. Hill and King (1995) estimated a pooled time series model for five year periods between 1960-1988 for 152 developing countries across SSA, South Asia, the Middle East and North Africa, East Asia and the Pacific, and Latin America and the Caribbean. They regressed levels of (rather than growth in) per capita GDP on women's educational participation rate and the gender education gap, along with a set of other control variables. The inclusion of a measure of the gender gap in education was intended to address multicollinearity.⁴

Their findings suggested that female educational levels had a significant positive effect on the level of GDP per capita while gender inequality in education had a negative effect. Gender inequality in education also had a negative impact on life expectancy and a positive one on infant mortality and fertility rates, suggesting that its effects on growth operated through both direct and indirect pathways. One limitation of the paper was that while the authors attempted to control for endogeneity, they failed to address the possibility of reverse causality or simultaneity bias.

The possibility of reverse causality was addressed in Dollar and Gatti (1999) who estimated a simultaneous model of gender inequality and per capita income growth to take this into account. Their analysis used five year averages for the period 1975-1990 for a data set for more than 100 countries at different stages of development. Their measure of gender inequality was the share of the adult female population for whom secondary education was the highest level attained, controlling for the share of the adult male population for whom some secondary education was the highest level attained.⁵ Along with standard growth

⁴ The gender gap is measured as the ratio of female to male enrolments – primary or secondary depending on which is the largest. However, as indicated by Lorgelly (2000) such a measure biases upwards the gap coefficient compared to the use of a consistent variable (either primary or secondary enrolment) across all countries.

⁵ This suffered from the same upward bias signalled by Lorgelly (2000).

model variables, they also included regional dummies to capture unobserved spatial variations.

The first stage of their analysis for the full set of countries included in their sample failed to find significant results. However, once they divided the sample into 'more developed' and 'less developed' countries, with developed countries defined as having female secondary education attainment rates of 10.35 per cent or higher, they found diverging results. For the more developed countries, namely countries with 'high' female educational levels, male education had a modest negative coefficient while female education had a strong positive coefficient. For the less developed countries, the effects of both male and female education on per capita income were low and insignificant. These basic results held when they used instrumental variables for education to address simultaneity.

Dollar and Gatti (1999) suggested that there was an intuitive plausibility to these results. At the early stages of development when economies were largely agricultural and based on family farming, there might be positive returns to having one adult member literate but low and diminishing returns were likely to set in soon after. In such contexts, cultural preferences for educating males or market failures that acted against educating females were unlikely to carry significant productivity costs. As economies industrialised and became more reliant on wage labour, gender discrimination in education, which led to passing up higher-return investments in human capital, would start to impose productivity costs and slow down the rate of growth. In other words, they appear to be positing that the direction of causality at low levels of development runs from growth to gender inequality. It is only after countries reach a certain stage of development, and markets in labour develop, that gender inequalities begin to have an impact on rates of growth.⁶

Klasen (1999, 2002) used measures of gender inequality in both education as well as employment on economic growth for the period 1960 to 1992 for a sample of around 100 developed and developing countries. We discuss his findings on education here and report on his findings on employment in the next section. Klasen's measures of gender inequality in education were the female to male ratio of years of education in 1960 and changes in the ratio over the period studied. Along with some of the other standard growth model variables, his model also included initial levels of education in 1960 and subsequent growth in these levels.

Klasen found that gender equality in education had a significant and positive impact on growth and - in contrast to the Dollar and Gatti study – that the positive impact was found to operate in both developed and developing countries.⁷ This finding was strengthened by the results of a re-estimation of his model for the sub-sample of African countries in his overall sample. This showed that the total impact of gender inequality in education was even larger, suggesting, first of all, that human capital investments were important even in agricultural economies and secondly, given women's important role in agriculture in SSA, investments in women's human capital were of particular importance.⁸

Fertility rates had entered the study by Dollar and Gatti as an independent variable and showed the expected negative relationship with growth. While the authors had acknowledged the possibility that women's education might affect economic growth indirectly through its impact on fertility decline, they had not explored this further. This issue was explicitly

⁶ Such an interpretation is consistent with the finding reported by Foster and Rosenzweig (1996) that returns to education increase substantially as an economy becomes more developed. What is not addressed by Dollar and Gatti is the negative coefficient for male education.

⁷ Klasen however does not define developed and developing countries based on the level of female education as do Dollar and Gatti (1999) in their estimation of this equation.

⁸ Moreover, as highlighted by Abu-Ghaida and Klasen (2004), this study points to the importance of country-specific effects; in particular, it implies that the impact of schooling and gender inequality in education is likely to differ from country to country.

addressed by Klasen. He estimated models for fertility rates and under-five mortality rates and found that while average levels of education in an economy made very little difference to either variable, the ratio of female to male education had a negative and highly significant impact. He found that including fertility and child mortality in his 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. Part of the impact of women's education on growth in SSA could thus have worked via its impact on fertility rates. Finally, also controlling for potential simultaneity bias,⁹ his findings confirmed that gender equality in education was associated with subsequent growth, suggesting that the direction of causality went from gender inequality to economic growth, even in lower income countries.

Klasen (1999) highlighted some of the differences in his estimation procedure which helped to explain differences in his findings to those of Dollar and Gatti: the use of a longer time period (1960-1992 versus 1975-1990),¹⁰ a longer growth interval,¹¹ given his assumption that benefits from education accrued in the long term, a different measure of human capital¹² and the attempt to deal with the problem of multicollinearity.

In a more recent study, Klasen and Lamanna (2009) confirmed these earlier results using an updated dataset on educational achievements covering the time period 1960-2000 for 93 countries and re-estimating the direct and indirect impact of gender inequality in schooling, as well as the impact of gender inequality in employment, on growth. However, they found that the moderate to poor growth performance in SSA and Latin America in the 1990s for reasons not related to any trends in gender inequalities in education meant that the positive impact of declining gender inequality in education was much stronger when these regions were dropped from the estimation.

Esteve-Volart (2000) used data from 87 countries for the period 1965-1989 to explore the impact of the ratio of female to male primary enrolment rates in 1965 on real per capita GDP growth. Her measure of overall education was secondary levels of schooling. Noting Dollar and Gatti's argument about cultural explanations for gender discrimination, she included religion as a proxy for culture in her model, to explore whether it had any direct impact on growth. Majority affiliation to Islam was used as her cultural measure of gender inequality. She also included dummy variables for countries in SSA and Latin America.

Her results supported the view that both an overall increase in education as well as reduction in gender inequality in primary education led to an increase in growth. An increase in male education would stimulate growth in so far as overall education levels increased but, unless accompanied by an equivalent increase in female education, would lead to an increase in gender inequality that would dampen its effects on growth.

The study also found a weak quadratic relationship (convex) between gender equality and growth, consistent with the finding reported by Dollar and Gatti. She interpreted this as suggesting that 'increases in income lead to less education inequality, that these reductions in inequality are more important as countries get richer, and that this in turn, leads to larger increases in income' (Esteve-Volart 2000: 26). Affiliation to Islam had an insignificant impact, suggesting that religion did not have a major direct influence on growth. The dummy variables for Latin America and SSA suggested lower rates of growth in these regions for the period under study. To check the robustness of her results, she re-ran the basic model using

⁹ He instrumented the growth in education variables by fertility rate in 1960, its growth and government spending on education.

¹⁰ Klasen pointed out that over the period 1975-1990 many developing countries were going through economic crises.

¹¹ Dollar and Gatti used shorter panels of five years.

¹² Klasen considered Dollar and Gatti's human capital variable (the share of the population that has exactly achieved some secondary education) problematic as adults who have attained a higher level of education will be considered as those with no education at all. Klasen refers to the total years of educational attainment of the adult population.

two-stage least squares regression. The estimated coefficients for the measures of gender inequality in education remained positive but at reduced levels of significance while the quadratic relationship no longer appeared significant.

Given the fairly large changes in female to male educational attainment that had taken place over the period under study, Esteve-Volart then split her sample into two time periods: 1965-75 and 1975-89. The results suggested that the impact of gender inequality had changed over time with a linear relationship between inequality and growth for the period 1965-75 and a convex one for the later period. Thus, while acknowledging the cross section analysis may not be ideal from a statistical point of view, she noted that it nevertheless provided useful economic information since it provided 'a sort of summary' of the long-run effects of gender inequality on growth.

Baliamoune-Lutz and McGillivray (2007) used data for 41 SSA and Arab countries to examine the impact on economic growth of two measures of gender inequality in education: the ratio of girls to boys in primary and secondary enrolments and the ratio of young female to male literacy rates (15-24 age group). They also picked up on the suggestion by Dollar and Gatti regarding the significance of cultural variables. However, unlike Esteve-Volart's attempt to estimate the direct impact of religion on growth, they explored the impact of 'culture' on economic growth via its influence on gender inequality by including an interaction term between gender inequality and a dummy for Arab countries: 'Arab culture' was considered more relevant to their estimate than religion. They also included an interaction term for gender inequality and 'trade openness'. Among the other variables in their equation were the share of women in the labour force and dummy variables for oil-producing and for SSA countries. The study used time series (seven periods made up of four-year averages starting with 1974-77) and cross-sectional data with procedures to deal with the problem of endogeneity in the regressors.¹³

Their results suggested that while overall human capital had a positive impact on growth, gender inequality in literacy had a statistically significant negative effect which was robust to changes in specification. The interaction term suggested that the negative effect of gender inequality in literacy was even larger in Arab countries. The interaction between gender inequality in literacy rates and openness of trade had a positive effect, suggesting that some of the growth caused by greater openness to trade was being driven by the high proportion of uneducated women employed in export agriculture in the African context – and possibly export manufacturing in some of the non-oil producing Arab countries.

Gender inequalities in school enrolment yielded less robust results but controlling for oil-producing countries, the statistically significant co-efficient for the interaction between female secondary education and the dummy variable for Arab countries led them to conclude that there was 'robust statistical evidence that female secondary education (had) a positive effect on growth in Arab countries'. However, they suggest that primary and secondary education enrolment rates may suffer from serious measurement problems and do not reflect drop-out rates. For these reasons, they considered literacy to be a better proxy for the stock of human capital. In a later peer-reviewed version of this article, therefore no reference is made to enrolment rates (Baliamoune-Lutz and McGillivray 2009). Instead, the estimation results were reported only in relation to literacy rates on the grounds that 'Literacy better reflects an outcome and it is outcomes that matter most in terms of driving economic growth' (2009: 225).

A number of other studies confirm the emerging overall picture of the largely positive impact of gender equality in education on growth but add contextual variation. Knowles *et al.* (2002) provide more detailed insight into the market-mediated impacts of gender inequality in

¹³ This avoided the problem of finding appropriate instruments for two-stage least squares (2SLS) estimation by differencing the endogenous and predetermined variables and using lags of their own levels as instruments (i.e. Generalised Method of Moments (GMM) estimation).

education through their estimation of the relationship between years of schooling and long-term worker productivity. They used data on five year averages between 1960 and 1990 to estimate a growth equation in which male and female education were treated as separate (and imperfectly substitutable) factors of production with positive but diminishing marginal returns to education for both boys and girls.

They found that female education had a significant positive impact on GDP per worker, namely, a 1 per cent increase in female education would increase GDP per worker by 0.37 per cent, thereby contributing to higher labour productivity. Male education was generally weakly negative or else did not have a statistically significant positive effect, depending on the method of estimation and choice of variables included. These results held when sensitivity tests were carried out for the effect of influential/outlier variables as well as when measures were taken to allow for the possibility of simultaneity bias.

Brummet (2008) analysed cross-section data for 72 developed and developing countries over the period 1965-1984. Gender differences in average years of schooling were found to have a negative impact on per capita annual GDP growth in his full sample as well as for separate sub-samples of low/low middle and upper middle/high income countries. However, the study found that the gender differential in primary school enrolment had the largest and most significant negative impact on economic growth in low income countries. The impact of the secondary school differential was negative but smaller and statistically insignificant. He suggests that the greater impact of primary education on growth in low-income countries 'probably reflects the fact that literacy is especially important for indirect effects such as infant mortality or child education' (Brummet 2008: 18), an interpretation consistent with the conclusions by Balamoune-Lutz and McGillivray above.

Forbes (2000) studied the effect of male and female education on economic growth with a very similar model to Perotti (1996) and Caselli *et al.* (1996). He used various panel data estimation techniques for 45 countries for the period 1965-1995.¹⁴ In line with Caselli *et al.* (1996), he found that female education had a positive and significant impact while the impact of male education was negative, but not significant. It is worth pointing out at this stage that the negative coefficient for male education reported by a number of studies (often accompanied by a positive coefficient for the female one) is inconsistent with human capital theory and raises questions about what underlying phenomenon male education may be capturing. However, few of these studies speculate as to its meaning.

1.2 Gender, labour market participation and economic growth

Whereas there has been a steady growth in studies exploring the impact of gender inequality in education on economic growth, and considerable convergence in findings, there are fewer studies on the impact of gender inequality in labour market outcomes on economic growth and less consistency in the results, at least for some measures of gender inequality. The problem lies in the lack of internationally comparable data on relevant measures of gender inequality and in the greater difficulty of addressing problems of endogeneity and unobserved heterogeneity.

The studies by Klasen (1999, 2002) and Klasen and Lamanna (2009) cited earlier investigated the implications of gender inequality in labour market participation on economic growth. Gender inequality was measured here by two variables: the female share of the total labour force participation and the share of the female working age population in formal sector employment. Klasen (1999) found that the female share of formal employment had a large, positive and significant impact on growth but while the coefficient for female share of the

¹⁴ One shortcoming of the study was the use of a non standard income variable (non-PPP adjusted income).

labour force was positive, it was statistically insignificant. He advised caution on these findings since, given the poor data on women's employment, he was unable to find a good instrumental variable to test for reverse causality, as it could well be that it was growth that led to greater access to employment.

Klasen and Lamanna explored the impact of changes in the female share of the total labour force and ratio of female to male activity rates on economic growth over a longer period of time (1960-2000). They found 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 (as we saw earlier) once SSA and Latin America in the 1990s had been excluded from the estimates. This was a period when Latin America and SSA were experiencing lower than average growth rates for reasons that were not connected to trends in education.

When the authors used male labour force participation rates and the ratio of female to male labour force participation rates as their measure of the gender gap in employment, they found that the gender inequality measure was both positive and significant while the male economic activity rate had a negative but insignificant impact. Adding the education gap to the equation reduced the impact of the gender employment gap but it remained positive and significant while the education measure was insignificant. Once again, excluding SSA and Latin America increased the significance of the education gap but the employment gap remained significant. They concluded that, on the whole, their results suggested that gender gaps in labour force participation and education had a negative impact on growth but their relative importance varied according to the sample of countries, time period and definition of education used.

Baliamoune-Lutz and McGillivray (2007) cited earlier had included the female share of the labour force in their study of economic growth for a sample of SSA and Arab countries. Contrary to the findings reported in the studies discussed above, they found that female share of the labour force had a negative and statistically significant impact on growth. They suggested that this was an unsurprising result given the country contexts that they were dealing with: SSA had lower than average levels of growth but a long standing tradition of female economic activity, much of it in the agricultural sector and over-represented among unskilled labourers. The oil-producing economies, on the other hand, had high rates of growth but very low levels of female labour force participation.

A different set of results were reported by Esteve-Volart¹⁵ (2004) who used panel data on growth rates by states in India for the period 1961-1991. Her measures of gender inequality in labour market outcomes were the female to male ratio in the overall labour force and women's share of managerial positions. Controlling for endogeneity, the study found that both measures of gender inequality had a negative impact on state-level growth rates but the impact of inequalities in the overall work force was larger: a 10 per cent increase in the female to male ratio of total workers was estimated to increase growth in real per capita output by 8 per cent while an equivalent increase in the ratio at managerial levels would increase it by 2 per cent. The fastest growing states were those with lowest rates of gender inequality in employment.

One other finding worth noting from the study relates to her disaggregation of growth rates by sector. In this case, lower ratios of female-to-male workers significantly reduced total output in both the agricultural and the non-agricultural sectors of the economy, but the female to male ratio among managers was not significant for agriculture. In other words, it was gender

¹⁵ This study is based on the same theoretical model as Esteve-Volart (2000). Here we are, however, discussing only the results of the empirical validation of the theoretical model.

equality in the labour force more generally that counted in the agricultural sector. The misallocation of managerial talent had greater significance outside agriculture.

Somewhat different in their approach, but also drawing on the idea that greater gender equality in the labour force would optimise the use of human resources within an economy, a number of studies have used simulation techniques to estimate the likely impact of greater gender inequality in labour market outcomes on economic growth. Using data from 11 countries from Latin America and the Caribbean, Tzannatos (1999) estimated that re-allocations of the labour force to eliminate the gender segregation of occupations where women were crowded into a limited range of poorer paid jobs would increase women's wages by 50 per cent, have a negligible impact on male wages and raise national output by between three and nine per cent. A more recent study used micro-simulations in eight Latin American countries to suggest that eliminating barriers to women's labour force participation, and equalising their access to different occupations, would reduce the incidence of poverty and promote a rise in income in all eight countries – although by varying amounts (Costa *et al.* 2009). The greatest impacts on growth were likely to occur in countries with high gender inequalities in participation rates, i.e. where the average female participation rate is below 60 per cent and the male one is above 80 per cent, although reductions in gender wage gap and more balanced occupation distribution were also important factors.

1.3 Gender, wages and economic growth

The seeming synergy between gender equality and economic growth has been challenged by a recent cluster of studies which include gender wage gaps as one of their measures of inequality. This in turn has given rise to considerable debate about whether, and under what circumstances, gender wage gaps promote or inhibit economic growth. Blecker and Seguino (2002) pointed out that the East Asia region has been characterised by comparatively low gender inequality in educational attainment and comparatively high inequality in earnings. Such wide gaps between the productivity of, and remuneration to, female labour are likely to have played an important role in the region's rapid growth in context of export-oriented industrialisation.

Seguino (2000a) used 1975-1995 data for 20 semi-industrialised export-oriented economies to explore this hypothesis. She found that both male and female education were positively associated with growth, with female education exerting a stronger impact over time. However, controlling for these gender differences in educational attainment, she found that the gender gap in manufacturing earnings was also positively associated with economic growth, largely via its positive impact on investments and exports. This relationship held, even when the gender wage gap measure had been adjusted for educational differentials. It also held both across countries and over different time periods.

In Seguino (2000b), the author used the same methodology to explore the impact of gender gaps in wages on economic growth for nine Asian economies from her earlier sample. She found once again that countries with the widest gender wage gaps, adjusted for gender differences in education, grew most rapidly. This held for equations using period averages as well as panel data. Once again, a key route through which the gender wage gap contributed to growth appeared to be through its positive impact on profits and investment.

As Blecker and Seguino (2002) had noted, given women's relatively high levels of educational attainment, the gender gap in wages could not be explained away in terms of the low productivity of female labour relative to male. Rather it appeared to reflect the discriminatory attitudes and practices embedded in prevailing gender norms that promoted the idea of women's secondary earner status together with state policies which helped to crowd women into the export manufacturing of highly labour intensive and price-elastic

goods which, together with the state repression of labour organisations and high capital mobility, served to restrict women's bargaining power and lower their wages. Productive but cheap female labour attracted investment by signalling high profitability¹⁶ which in turn boosted exports and economic growth.¹⁷

Seguino (2000a) suggested that such gender discrimination in wages was easier to maintain in highly patriarchal societies which were characterised by social institutions that curtailed women's mobility in the public domain and facilitated their 'crowding' into a narrow range of poorly-paid jobs or unpaid household work. Whether such a strategy could be pursued in countries where patriarchy did not lend itself to such controls over women's life options remained to be seen.

Two recent papers have sought to replicate the approach taken in Seguino (2000a) but with some variation in the data used and with differing conclusions. Schober and Winter-Ebmer (2009) re-analysed the relationship between the gender wage gap and export-led growth along the lines suggested in Seguino (2000a) using what they described as a more internationally comparable wage discrimination data.¹⁸ This was drawn from a meta-analysis of existing studies of gender wage differentials which sought to standardise estimates of gender wage discrimination and use them in a meta-regression analysis to make results comparable across studies. They carried out their estimation on varying samples of countries, both the sample included in Seguino's study as well as variations on this sample. They concluded that investment had a large positive effect on cross-country growth rates, human capital (years of secondary education of population aged 15 plus) was generally positive but the impact of gender wage differentials was either zero or negative, depending on the sample of countries used.

Their findings have been challenged by Seguino (2011) on a number of grounds. First, she points to the problematic nature of their measure of gender wage gaps. Their data was based on 263 micro-level national studies from which they developed a time-series data set. Given the differences in methodologies, sectoral coverage, control variables and workers covered by these studies, there is considerable inconsistency in the measurement of wage gaps from year to year so that they do not lend themselves to panel data estimation techniques.

Secondly, she suggests that the failure to restrict the wage sample to the manufacturing sector where most women workers are concentrated and where gender wage disparities are generally largest, underestimates the relevant degree of wage disparity and may explain the lack of impact on growth. Thirdly, the wage gap dataset used by Schober and Winter-Ebmer is taken from various human capital type regressions that control for a variety of factors in order to identify and decompose the determinants of the gender wage gap, some of which might relate to productivity differentials. In actual fact, many of the variables used are themselves products of discriminatory processes (such as the share of females in an industry) so that their inclusion reduces the extent to which wage gap data capture discrimination.

Mitra-Kahn and Mitra-Kahn (2008) have also returned to Seguino's analysis, using the same data as used by Seguino but with variations on her sample of 20 semi-industrialised countries. First of all, they estimated Seguino's model for seven of the Asian economies in

¹⁶ High profitability is attributed to the ability of firms to pay female labour less than males without leading to negative political repercussions that would erode GDP growth gains.

¹⁷ Rodrik (2000) reported that Mauritius set on a development strategy that relied on operating an export processing zone (EPZ). The gender segmentation of the labour market, with female workers predominantly employed in the EPZ, was crucial as it ensured a large additional pool of low wage labour with few rights for export production. Male workers have been able to preserve their status in the rest of the economy.

¹⁸ Seguino (2000a) had used aggregate gender wage gaps which do not account for the different productivity of males and females.

her sample for the period 1975-1995: Sri Lanka and Philippines were excluded as later industrialisers than the rest. The various gender wage gap specifications, both raw and adjusted for education, in this model indicated both a negative relationship between the change in the wage gap and growth and a larger coefficient than the positive one reported by Seguino. So in these economies an increase in the gender wage gap was correlated with a reduction in growth. When testing the relationship between the level of the wage gap and growth, the coefficients were positive, but the standard errors so large that confidence intervals include both positive and negative values with the coefficients statistically insignificant. Female labour supply was statistically insignificant but positive, possibly suggesting that employing more women in low skill, low wage jobs could be associated with lower costs and higher profits. The difference between the negative coefficients on the change in the gender wage gap, and the positive coefficient on the level suggested a non-linear relationship between gender wage gaps and growth.

They then ran the same regression for all 20 countries in Seguino's original model, thus adding 14 non-Asian semi-industrial economies (SIEs) from Latin America and Europe. This continued to give negative wage coefficients but smaller ones as well as large standard errors suggesting that the two samples were likely to be very different. This was confirmed by the use of an Asian Tiger dummy variable. Based on this, they divided the sample into an Asian Tiger group made up of early industrialisers (South Korea, Singapore, Hong Kong and Taiwan) as well as the second tier newly industrialised countries (NICs) from Asia (Thailand, Indonesia and Malaysia). Seguino's analysis had also included a group of European countries, Greece, Portugal and Turkey, which the Mitra-Kahn's tested separately, and then added to the 'other' semi-industrial countries. Cyprus, Philippines, Sri Lanka, Brazil, Chile, Columbia, Costa Rica, El Salvador, Mexico and Paraguay thus formed a separate group. They found that the coefficient on the quadratic form was negative for the Asian tigers, meaning the relationship had a concave shape. For the rest of the sample, there was a more pronounced positive convex relationship between gender wage gaps and growth of the kind reported by Seguino.

The study concluded that gender wage gaps could indeed promote growth by reducing production costs and supporting exports in a positive convex relationship but this effect only appeared to operate in the early stages of an export-led growth strategy. It pointed out that the positive effect from wage discrimination is technically gender-neutral, the objective of such a policy is that someone has their wages lowered relative to others. While this occurred in Southeast Asia during the period in question, there is no reason that gender discrimination should be a policy instrument, only that lowering costs of manufacturing would be. The observed relationship was reversed as countries grew and moved up the value-added ladder - as had happened with Asian tigers over the 1975-1995 period. As internal markets developed, as countries moved from low into high skill export manufacturing or as they became less dependent on exports for growth, the 'optimal' level of wage inequality diminished: higher wage inequality could become increasingly detrimental to growth.

In addition, the authors pointed out that the ability to maintain large gender wage gaps did not exist in a vacuum. Wage discrimination tended to be most severe in areas where there was other evidence of entrenched gender inequality such as restrictions on women's mobility. Nor was it inevitable that women workers would take such discrimination without protest. As long as countries were unsuccessful in raising economic growth and remained low cost/low skill exporters, women workers might be willing to accept poor conditions in the export sector since alternative opportunities for work were limited. But if countries became more successful, domestic markets developed and export industries moved into higher technology and skill-based production which required a more educated and skilled work force. As workers became more educated and organised, they were likely to become less willing to acquiesce to continued wage discrimination.

However, Seguino (2007a, 2010) challenges the inevitability of this process, especially in SIEs that employ primarily women in labour-intensive firms. She notes that as capital has become increasingly mobile, its ability to relocate to other lower wage sites if faced with rising wages in labour-intensive, export-oriented manufacturing has reduced women's ability to bargain for higher wages. This in turn reduces pressure on firms to innovate and therefore slows down productivity growth. This explains why it is possible for wage gaps to remain wide, even when the demand for female labour is strong.

Busse and Spielmann (2006) add a further nuance to this debate. They use three measures of gender inequality: wage remuneration; labour market activity; and literacy rates and secondary school attainment. Gender-differentiated wage data was only available for 29 developed and developing countries. A higher degree of gender wage inequality was found to be positively associated with a higher share of labour-intensive exports as a share of total export. A higher share of women in the overall labour force – namely greater gender equality in labour market participation rates – was associated with strong comparative advantage in relation to labour intensive exports, holding constant for other country characteristics, although this result weakened over time, according to panel data analysis. Greater gender equality in education also led to a higher share of labour intensive exports over time.

These results are broadly in line with those of Seguino in that wage differentials are shown to boost total exports in export-oriented SIEs. However, the authors argue that they do not necessarily mean higher growth rates as 'the country might be locked to the production' of certain commodities and 'might not be able to switch to higher-valued goods over time' (Busse and Spielmann 2006: 374).¹⁹ There could even be a negative impact if prices of labour-intensive products go down and competition increases. At the same time, low income countries that do not rely on exploiting their female work force in the production of labour-intensive commodities for export may find it harder to compete with those countries that do. They also add that industrialised countries may benefit from gender inequalities in low-income countries if it leads to lower prices for labour-intensive goods.

What is very clear from these various studies is that the role of gender equality is likely to differ across countries, depending on the type of gender job segregation, coupled with the structure of the economy. For example, in some countries, the bulk of exports are in male-dominated industries so that female wages will be less relevant to export-led growth while in other contexts, access to credit rather than level of wages may be the salient macroeconomic variable. Consequently the size and sign of the gender wage gap measure is likely to vary depending on the sample of countries used.

This possibility has been explored by Seguino (2010) through a largely theoretical comparison of the impact of gender equality in wages on growth in low-income agricultural economies, such as those in SSA, and semi-industrialised export-oriented economies of the kind she had investigated earlier. As her empirical work had suggested, in semi-industrialised export-oriented countries seeking to compete in the global economy, gender gaps in wages that are larger than gender gaps in productivity are likely to attract foreign investment and ease balance of payments constraints to growth. In low income agricultural economies, on the other hand, she argues, where men are more likely to be found in export-oriented agriculture or extractive industries, and women in subsistence agriculture, greater gender equality in wages can stimulate output and ease balance of payments constraints because women will be able to invest more in their agricultural efforts, increasing food production and reducing reliance on food imports. However, in the absence of suitable data, this remains a largely theoretical exercise. In any case, a question mark must remain as to how much impact male-female wage differentials are likely to have in most of the low income

¹⁹ This appears to be the case for Bangladesh, for instance, that remains locked into export-manufacturing of garments to drive its growth, although there has been some movement from highly labour intensive woven garments to more capital intensive (and less female-intensive) knitwear.

agricultural economies of SSA where the bulk of the labour force is likely to be in various forms of self-employment, on and off the farm.

1.4 Summing up

Summing up the findings reported in this section, we venture the following generalisations. First of all, the studies suggest the importance of considering both the direct and indirect pathways through which gender inequality impact on growth. Direct effects relate largely to the question of the optimal use of labour in an economy and the extent to which gender discrimination is lowering the average productivity of labour available in the economy. Indirect effects revolve around various positive externalities associated with improvements in women's access to education, income and work: these include impacts on fertility, mortality and health.

The importance of considering both set of impacts has been emphasised by Appiah and McMahon (2002) who show that direct effects on market-measured outcomes, as captured by rates of return studies or standard growth equations, underestimate the true returns to education since they do not include indirect impacts. Simulations using data from Africa suggested that indirect feedback effects were around 90 per cent of the direct effect of education on pure economic growth. When the indirect feedback effects on economic growth via impacts on non-market aspects of development were included, the indirect effects exceeded the direct. This was different from the OECD countries, where indirect effects were generally smaller: McMahon (2000) suggested 39 per cent rather than 90 per cent of total effects.

Secondly, the studies suggest that a greater degree of confidence can be attached to certain measures of gender equality than others. The findings relating to the positive impact of female education on economic growth appears to be robust in a variety of econometric specifications, data, time periods and country groupings. What varies in the studies is the level of education at which this effect kicks in: in some studies, it is relevant at primary level while others focus only on secondary level, possibly because the effect was insignificant at primary level.

There is also persuasive but less robust, evidence that women's share of the employment contributes to growth, although here again, the kind of employment may matter, with greater equality in formal employment appearing to matter more at the general level but women's share of the labour force mattering to a greater extent than their share of the management position in agricultural contexts. However, the paucity of relevant data and the quality of the available data, together with the greater difficulty of controlling for the possibility of reverse causality means that fewer studies have explored this aspect of gender inequality.

There is greater disagreement about the impact of gender inequality in wages but this appears to reflect the fact that the impact of this measure is likely to vary by level of income and structure of the economy. In particular, gender inequality in wages in contexts where female education is relatively high has delivered rapid growth to a number of semi-industrialising countries in the early stage of export-oriented manufacturing where the focus is on labour-intensive production. As countries move up the value chain, and domestic markets develop, the 'optimal wage gap' should begin to diminish finally converging to zero. However, the pace at which convergence occurs, or for that matter, the viability of the inequality-based route to growth for countries with different forms of patriarchy, remains a matter of debate. It is possible that the suppression of women's wages in the face of rising female productivity is more feasible in highly patriarchal societies with repressive governments – as was the case in the East Asian economies for a considerable period of

their industrialisation process.- than it is in other semi-industrialising countries, such as those discussed by Mitra-Kahn and Mitra-Kahn.

This draws attention to a third important generalisation. While there is persuasive evidence that certain aspects of gender equality do have a positive impact on economic growth, it is also clear that the strength of the impact, and the pathways through which it occurs, is mediated by various contextual factors, including the nature of growth strategies, the structure of the economy, the sectoral nature of the job segregation, levels of economic development and 'cultural' factors. It also varies according to the time frame of the study and whether the focus is on short-term, demand-induced growth effects or longer term growth models that allow for indirect and feedback effects to play out. As Appiah and McMahon (2002) point out, while some of the growth-related impacts of investments in education are more apparent in the short term, such as employment, earnings, better health and so forth, 'the cumulative effects large enough to affect the nation significantly cannot reasonably be expected for 25 years or more, and even a longer 40 or 45 years before it is reasonable to expect that stagnant economies or chaotic conditions in the poorest countries to begin to turn around'.²⁰

2 Does economic growth contribute to gender equality?

Compared to the proliferation of studies exploring the impact of gender inequality on economic growth, there appears to be less interest in the reverse relationship. This may reflect the lesser theoretical interest in the intrinsic arguments for gender equality on the part of mainstream economists so that there are no well-established models for the estimation of gender equality as there are for growth. In addition, given the multi-dimensional nature of gender inequality, there are no clear-cut theoretical guidelines as to which aspects should be given priority.

Nevertheless, we can discern various strands of arguments and assumptions in the literature as to the likely implications of economic growth for gender equality. The mainstream development literature appears to be largely dominated by a positive view of this relationship. One version of this is the view that gender inequality is linked to scarcity of material resources in a society so that women are placed at the back of the queue whether it is for food, health care, education or jobs, when these are in short supply, particularly if women's economic contributions are seen to be less than those of men. Growth will ease these constraints on households, 'reducing the grip of poverty', making it less necessary for households to discriminate against their female members (Dollar and Gatti 1999; Duflo 2005). In addition, Becker's theory that labour market discrimination is costly to maintain in the face of competitive market forces suggests that growth strategies that open economies up to global market forces will lead to a reduction of gender discrimination in employment and a closing of the gender gap in wages. Women's increased productivity will then make it worthwhile for households to invest more resources in female members. A third route is through the likely impact of growth on women's bargaining power. Economic development will expand women's work opportunities in the wider economy while labour saving technologies will enable them to reduce their time in unpaid domestic and agricultural activities and to take up these expanded market opportunities (Duflo 2012; Lewis 1956; Richards and Gelleny 2007). Increased access to jobs by women will increase their

²⁰ Appiah and McMahon (2002) add the importance of using worldwide cross-country data to estimate parameters reflecting longer term perspectives since these cannot be estimated reliably either over short periods of time or any given set of homogenous countries.

bargaining power at home and in the economy, leading to a diminution of gender inequality on various fronts (Blumberg 2005).

Counter-arguments to this derive from dependency theory and various strands of the feminist literature and suggest that economic growth will have little or no impact on gender inequality and may, under certain circumstances, exacerbate it. First of all, there is no guarantee that economic growth will have any impact on gender inequality because, as pointed out in Kabeer (1996: 14), 'the forces that create inequalities of wealth and opulence in a society embody quite different social norms and material practices to those which create inequalities of gender'. Certain conditions have to be in place if economic growth is to constitute a strong enough force, or provide the preconditions necessary, to overcome the historically entrenched patriarchal structures which give rise to these inequalities of gender.

As recent research suggests, the initial conditions characterising growth trajectories together with the pattern of growth is as – or even more - important for its impact on poverty reduction and human development as its pace. A similar point can be made in relation to gender. For instance, growth which generates forms of employment which largely favour male workers, as in many of the oil economies of the Middle East, has served to buttress existing ideologies of the male breadwinner, leaving pre-existing gender inequalities largely intact (Moghadam 2003). Equally, however, where countries seek to compete in the global economy by exploiting women's disadvantaged position in the labour market as a source of flexible labour, the jobs that women gain may do little to transform their bargaining power within the economy, particularly against a background of a reduction in the public expenditures that might lessen the burden of women's unpaid reproductive work (Beneria 2003).

It is therefore important to distinguish between different patterns of growth rather than assuming all growth to have uniform impacts on gender equality. In relation to this point, Seguino suggests the need to differentiate between the impact of growth before and after the 1980s to distinguish neo-liberal macro-economic policies associated with economic openness, liberalisation, debt crisis and structural adjustment from pre-1980s growth strategies which may have had very different gender implications. To allow for the impact of the policy regime, many studies include policy measures, such as openness to trade and share of public expenditure as explanatory variables, along with changes in per capita GDP.

In addition, there is considerable diversity in the indicators used to measure gender inequality. They include various labour market measures, including women's share of the labour force and gender gaps in wages, but also measures of health (fertility rates, male-female mortality differentials, the ratio of women to men in the population) and education, including literacy, as well as various measures of legal equality. There are good reasons for this diversity. As Seguino (2006b) has argued, in agricultural economies where markets are thin or the manufacturing sector very small, reliance on the kind of market-generated data that is used in more developed market economies is unlikely to capture relevant trends in gender equality. Direct measures of well being and capacities may be more appropriate. We begin our discussion of this literature with studies that focus on economic measures of gender equality before moving onto studies which use measures of health inequalities and access to rights as well as a number of composite indicators.

2.1 Economic growth, gender and labour market participation

There is a significant strand within the literature that suggests that there is a U-shaped relationship between economic growth and female labour force participation, in other words, women's labour force participation rates are relatively high in low-income agrarian economies but decline with economic growth up to a certain point before they begin to rise again. This has been given a 'stylised' explanation along the lines that women's labour force

participation is high in low-income agrarian economies with close linkages between household and market production, that it begins to decline as economies move into formal manufacturing and services as the basis of growth but that at a subsequent stage, structural changes combined with rising female education and declining fertility rates, female activity rates rise again (Bloom *et al.* 2009; Cağatay and Özler 1995; Forsythe *et al.* 2000; Goldin 1995).

However, using dynamic panel data methods covering the period 1980-2005 (rather than static panel data or cross-sectional country data), Gaddis and Klasen (2011) find that the U-shape tends to vanish and that instead, historically contingent initial conditions which had given rise to variations in levels of female labour force participation rates remained the most important determinants of current variations. However, sectoral growth patterns did have some impact on female labour force participation rates – with the largest impacts associated with growth in value added in agriculture, manufacturing and certain service sub-sectors (such as trade, hotels and restaurants) and the lowest with natural resource extraction.²¹ They conclude that ‘while it remains possible that today’s advanced economies transitioned through the U over the course of their economic development, the U-shape seems to have little relevance for developing countries’ with the exception of a small group of countries dominated by natural resource extraction (2012: 28).

The absence of a decline in female labour force participation rates with economic growth in developing countries today is consistent with the other widely documented finding in the literature - which is the steady rise in female labour force participation rates since the 1980s and the gradual reduction of the gender gap in participation rates (Elder and Schmidt 2004; Standing 1999). This has been at least partly growth-driven: as estimates by Kapsos (2005) suggest, the employment elasticity of growth²² for the period 1991-2003 was consistently higher for women than men in most regions of the world, with the exception of Central and Eastern Europe and the Commonwealth of Independent States. He also found evidence that export orientation of growth was associated with increased female employment elasticity. Other studies have noted that while employment elasticities are generally greater for women than men, particularly in recent decades (since the 1990s), there is considerable variation by type of growth (Braunstein 2012). For instance, within the African context, the weakest employment elasticities, and the least impact on women was to be found in oil producing economies (Braunstein and Seguino 2012), a finding consistent with that reported by Gaddis and Klasen.

Heintz (2006) used panel data (1970-2003) for 16 low and middle income countries to explore the relationship between economic growth and employment in the context of trade liberalisation. He found that economic growth had a positive impact on overall employment, along with public expenditure and exports as a share of GDP. However, import penetration and high short-term interest rates both dampened employment growth. A gender-disaggregated analysis of this relationship showed that economic growth *per se* had no significant impact on male or female employment but that the policy orientation of growth strategies had contradictory effects. Trade liberalisation, particularly the share of exports to GDP, had a strong positive impact on female employment while raising short-term interest rates reduced it. By contrast, trade liberalisation, particularly the share of imports, reduced male employment, but interest rates had little impact. Heintz warns that much of the international data on employment fails to capture the full extent on informal employment so that caution has to be exercised in interpreting the results. Nevertheless, his results provide

²¹ Of course, such highly aggregated data does not allow the authors to pick up on the ‘defeminisation’ of manufacturing that has been noted as countries move from low value-added labour intensive stages to higher-value added and capital intensive stages that has been noted in a number of contexts (Ghosh 2009). While women may remain in the labour force, the move out of export manufacturing is generally associated with a move into poorer quality service sector jobs.

²² The employment elasticity of growth measures how responsive employment is to economic growth. It captures the percentage change in employment associated with a 1 per cent change in economic growth.

broad support for the earlier point about the importance of patterns of growth, in this case, the extent and direction of trade liberalisation, in determining their gendered impacts.

Further insights into the impact of trade liberalisation on labour market outcomes are provided by Bussmann (2009). Her analysis was based on panel data between 1970-2000 for 134 developed and developing countries. Her measures of work were overall female labour force participation rates, controlling for male, as well as by the share of women's employment in different sectors as a percentage of total female employment. Trade openness was measured by the trade to GDP ratio while she also included both per capita GDP and the square of the term to capture possible non-linearities in its relationship with women's working life. Other variables include female secondary schooling, type of political regime (ranging from pure autocracies to pure democracies), size of population, fertility rates and male equivalents of the dependent variables.

The impact of trade openness on women's working lives was estimated separately for OECD and non-OECD countries because theoretically, it was likely that the impact would operate differently for industrialised and developing countries. The results suggested that openness to trade, both overall as well as disaggregated by exports and imports, had a significant negative impact on female labour force participation in OECD countries and a significant positive one in non-OECD countries. In other words, not only exports but also volume of imports, created jobs for women in developing countries – suggesting that the findings reported by Heintz may have been largely reflecting the impact of trade liberalisation in developing countries. Both per capita GDP and its quadratic form were insignificant in OECD countries but highly significant in the non-OECD ones. The signs of the results suggest that among developing countries, female labour force participation first declined and then rose with per capita income levels. Democracy and female secondary education were both associated with significant positive coefficients for female labour force participation in OECD countries while fertility rates exercised a negative effect in both groups of countries.

As far as women's share of employment by sector was concerned, higher levels of per capita GDP and openness to trade led to a reduction in the share of agriculture in women's employment in both OECD and non-OECD countries but they differed in their impact on the share of other sectors. Female secondary schooling increased the share of services in female employment in both groups of countries.

Seguino (2003) suggests that 'non-OECD countries' are too heterogeneous to treat as a single undifferentiated category for the purposes of analysing the impact of trade openness. She used pooled cross-sectional time series panel datasets for 1980-1999 for three large Caribbean countries (Barbados, Jamaica, and Trinidad and Tobago) to investigate why female unemployment rates were higher than those of male despite the fact that a) their educational attainment rivalled, and even exceeded those of men; b) that the economies in question had a strong export orientation as well as large service sectors, including tourism, which tends to be hospitable to female employment; and c) that there was a high incidence of female-headed households in this region suggesting that many women were primary breadwinners for their households.

She found that while both male and female unemployment rates had been declining between 1980 and 1999, the ratio of female to male unemployment rates had not shown a significant decline, suggesting resilience in the factors that led to higher rates of unemployment among women. Female unemployment rates might, in fact, have been much higher if women had not out-migrated to the extent they did in the 1980s and 1990s. There was little evidence that foreign direct investment (FDI) either reduced unemployment rates or the gender gap in these rates. One factor that was associated with a rise in female unemployment rates relative to male was the rising share of women in the labour force. This suggested that men and women were not substitutes in the labour market so that rising female labour force

participation relative to male led to the crowding of women into a fixed number of job slots: gender job segregation in turn contributed to higher rates of unemployment for women.

She used a measure of the deviation of the GDP from its trend to capture periods of economic upturn and recession. While her results showed that both male and female unemployment declined during periods of upturn and rose in downturns, she also found that economic upturns contributed to an increase in female unemployment relative to male. In other words, men gained more than women in accessing newly created jobs during an upturn, widening the gender gap in access to paid work. In fact, men were hired to a greater extent than women during an upturn even in the typically female-dominated service sector. It was evident that in this region, national policies to stimulate economic growth or to open up the economy to FDI had not sufficed to equalise access to jobs for men and women. More targeted policies, including affirmative action policies were also needed.

2.2 Economic growth, gender and earnings

We turn next to studies exploring the impact of economic growth and trade liberalisation on gender disparities in wages. Oostendorp (2009) drew on the ILO October Inquiry database which contained information on wages for 83 countries for the period 1983-1999 to explore the impact of changes in per capita GDP on occupation-based gender wage gaps at the global level. Along with economic growth, the study included trade and net FDI flows as a percentage of the GDP as measures of globalisation and distinguished between low and high-skilled occupations. Noting that descriptive analysis showed variations in the relationship between economic growth and gender wage gaps by level of economic development, regression analysis was carried out separately for low/lower middle income and high/higher middle income countries. Using instrumental variables to allow for the possibility of reverse causality between trade and FDI variables and gender wage gaps, the study found that economic growth, trade and FDI inflows all led to a decrease in gender wage gaps for the richer countries. The main causal mechanisms were reductions in gender discrimination and increase in the relative demand for female labour, with neither dominating. However, neither growth nor trade nor FDI flows appeared to have had much impact on gender wage gaps in poorer countries, suggesting that some kind of threshold of development had to be reached before markets worked sufficiently well for such impacts come into operation.

Other studies of the impact of economic growth on gender wage gaps have used country level data. They also provide somewhat mixed findings, confirming that the relationship is not a straightforward one but is likely to be mediated by a variety of country specific factors. One of these factors, Seguino (2000c) argued, was the mobility permitted to capital: in economies where firms were relatively free to relocate production to other countries, any increase in the wage rate would entail a larger reduction in employment in the export sector. Where women were largely concentrated in more mobile, export oriented industries, their capacity to bargain for higher wages is likely to be weakened as employers can more easily relocate in lower wage sites. She suggested that this helped to explain diverging trends in the gender wage gap in the manufacturing sector in Taiwan and South Korea, two fast growing middle income countries, during the period 1981-1992 when gender wage gap decreased in South Korea but increased in Taiwan.

Along with estimating her model for three alternative measures of the mobility of physical capital,²³ her study included various labour related variables that might have an influence on the gender wage gap. These included changes in the value of output as a measure of the

²³ The measures of capital mobility used are: 1) total FDI as a share of GDP; 2) total FDI as a share of gross fixed capital formation; 3) outward FDI as a share of gross fixed capital formation.

overall demand for labour in the economy and labour force participation rates as a measure of labour supply. Gender differentials in higher educational attainment and in percentages employed in professional/technical and managerial/supervisory were included as measures of relative productivity and the occupational structure. She also factored in various proxies for women's bargaining power relative to men, including gender differentials in unemployment rates and a measure of gender segregation in the labour market (crowding). In addition, the model included a time dummy variable to capture labour market policy shifts. In Taiwan, this distinguished between 1981-86 and the rest of the period to allow for the delayed enforcement of the 1984 Labour Standards Act – which established a protective legislation for female workers. In South Korea, it distinguished between 1981-1989 and the rest of the period to allow for the impact of minimum wage legislation, passed in 1986 but not widely implemented in the manufacturing sector till 1990.

Her findings suggest that in Taiwan, women's share of professional/technical jobs and their secondary and higher education levels relative to men both served to reduce wages gaps. The bargaining power variables had mixed impacts. A reduction in the crowding of female jobs relative to male reduced the gender gap, as expected, while increases in capital mobility contributed to a widening of the gap. The policy dummy, while having a negative effect on the gender gap, was statistically insignificant for all three measures of capital mobility. However, increases in male unemployment relative to female increased rather than reducing the gender gap, an unexpected result which, according to Seguino, was likely to reflect measurement error in relation to female unemployment.

In South Korea as well, increases in female education relative to male, in women's labour force participation rates relative to male and in women's share of managerial/technical jobs led to the expected reduction in gender wage gaps as did a steeper decline in female unemployment rates. In addition, the policy dummy measuring the enactment of minimum wage legislation had a positive effect on female earnings relative to male for all three measures of capital mobility. However, an increase in male crowding in jobs relative to female increased the gender gap, a finding inconsistent with the bargaining power hypothesis. Capital mobility had a positive but insignificant impact on the gender wage gap.

Seguino concluded that the impact of capital mobility on gender wage gaps was mediated by a variety of factors, including the passage and enforcement of gender-equality policies and women's relative bargaining power. The very different impacts of the capital mobility measures on the gender wage gaps in the two countries appeared to reflect differences in the extent to which the two countries liberalised their capital regimes in the early 1980s as part of their bid to join the WTO. Taiwan went much further than South Korea, leading to a substantial increase in outward physical capital mobility by the mid-1980s. Much of outward capital flow was from female-dominated industries in the home country. South Korea was far more cautious in its liberalisation strategy and outward investment by its firms was not only much smaller relative to total investment than Taiwan but a sizeable proportion of this related to capital-intensive, male dominated industries in the home country.

The very different impact of labour market legislation in the two countries is also worth noting. It has been suggested that the passage of protective legislation for female workers in Taiwan, including paid maternity leave, made female labour more costly for employers and led to them offering women lower wages (Zveglic and van der Meulen Rodgers 1999). The 1986 minimum wage law in South Korea did not actually go into effect till 1990: it set minimum wages in a number of female-dominated industries lower than other industries. This may have helped to lift female wages without necessarily leading to higher levels of female unemployment.

Berik *et al.* (2004) addressed a similar set of questions to Seguino (2000c). They used a panel dataset for the period 1980-1999 for Taiwan and South Korea to explore the impact of

increasing exposure to international trade on gender wage gaps, differentiating between more and less 'concentrated' industries. They noted that exposure to international trade had gone much further in Taiwan than South Korea over this period. Female to male wage ratios had declined in Taiwan while they had risen in South Korea but from very low levels. The residual wage gap, a sharper indicator of discrimination than the overall wage gap, rose steadily in Taiwan till the mid-1990s, a period of increasing openness to trade. Real wages were higher for both men and women in the concentrated industries although men in non-concentrated industries still earned more than women in concentrated industries. In South Korea, the residual wage gap in concentrated industries was higher than that in non-concentrated industries in the 1980s but dropped below it in the 1990s when trade openness was on the decline or stagnating. Here too wages were higher for both sexes in the concentrated industries.

Their regression results suggested that in Taiwan, increased openness to imports over time in the concentrated industries was positively and significantly associated with a larger residual wage gap, implying increased discrimination against women workers; basically, competitive forces from international trade were found to increase discrimination against female workers. The results held when the period of the financial crisis was excluded from the estimates. Competition associated with imports appeared to have a stronger impact on the residual gap than competition associated with exports. In South Korea, higher export ratios in concentrated industries were positively associated with the residual gender wage gap but the results were not significant for all specifications of concentration.

The results using a panel dataset provided similar results. For Taiwan, trade competition from imports was positively and significantly associated with wider residual gender wage gaps, regardless of definition of domestic concentration and whether or not the period of the financial crisis was included. Import competition appeared to widen the wage gap by its adverse impact on women's relative employment prospects and loss of bargaining power. In Korea, a slight reduction in export openness appeared to be associated with less wage discrimination by gender in the concentrated industries. In short, increase in competition from trade can perpetuate gender wage gaps in countries where women are segregated into lower paying, lower status jobs and have lower bargaining power or higher threat of job loss. In both contexts, the authors argue, equal pay and equal opportunity legislation, effectively enforced, would be crucial to ensure that gender discrimination did not drive cost-cutting strategies on the part of employers.

Menon and van der Meulen Rodgers (2006) also explored the impact of trade liberalisation, and greater exposure to competitive forces, on gender wage gaps, this time in the context of India. They used four rounds of cross section data on India's manufacturing sector collected between 1983 to 2004, dividing the manufacturing sector into industries that had been more exposed to domestic competition prior to liberalisation and were characterised by more numerous and smaller establishments and those that had been protected from domestic competition, the more concentrated, generally more capital intensive sector. They found that trade liberalisation affected the less concentrated industries to a greater extent with greater growth in the ratio of both imports and exports to their output compared to more concentrated industries. There was also a rise in (cheaper) female labour in both sets of industries, but with a higher percentage rise in the less concentrated industries.

They also found that increasing openness to trade in the more concentrated industries was associated with higher gender wage gaps – the cost cutting measures taken to deal with international competition thus appeared to protect male jobs and male wages relative to female to a much greater extent in the previously protected industries - a reflection perhaps of the greater presence of largely male-dominated trade unions in this sector. As the authors observe, women's lower bargaining power meant that they were less able to defend their position in the face of the cost-cutting exercises undertaken by the more concentrated

industries. One other point to note from the study is that the impact on gender wage gaps was more severe in industries characterised by a high value of imports than by a high value of exports.

A somewhat different set of findings were reported by Hazarika and Otero (2004) who used data from the National Urban Employment Survey in Mexico to explore whether trade liberalisation, and accompanying exposure to international competition, had led to a reduction in gender wage gaps because of the increased costs of continued gender discrimination. They carried out their analysis in a series of steps. First of all, given that the maquiladora sector had been exposed to international competition far earlier than the rest of urban economy (since 1965), they compared the gender wage gap in the maquiladoras with that in the rest of the urban economy. Secondly, given the increased liberalisation of the rest of the urban economy since the mid-1980s, particularly with the advent of the North American Free Trade Agreement (NAFTA) in 1994, they investigated whether there had been a more rapid narrowing of gender wage gap in the non-maquiladora sector, given increased competition. And finally, given that tariff elimination under NAFTA was a phased process with tariffs falling faster in some sectors than others, and some sectors exempt altogether from tariff elimination, the study explored whether the expected narrowing of the gender wage gap proceeded more rapidly in the non-maquiladora sector experiencing more rapid reduction of tariffs under NAFTA.

The study found, first of all, that both men and women in the maquiladora sector earned 25 per cent lower wages than comparable workers outside it, suggesting cost-cutting in the face of export competition had taken the form of reduced wages. However, the gender wage gap was also lower in the maquiladora sector: women earned 87 per cent of the wages of male maquiladora workers compared to 72 per cent of the wages earned by comparable male workers outside this sector. Secondly, the study found that while female to male earnings ratio in the non-maquiladora sector increased by 4 per cent between 1987, the beginning of the liberalisation period, and 1999, the immediate post-NAFTA period, while the ratio in the maquiladora sector declined by 11 per cent during this period, although it remained higher than the rest of the economy. This supports the hypothesis that liberalisation of trade reduced the gender earnings gap in sectors of the economy newly opened up to competition from imports but led to its widening in the export-oriented maquiladora sector which was not subject to import competition.

Finally the study found that female to male earnings ratio increased by 6 per cent between 1987 and 1999 in those non-maquiladora industries with complete elimination of tariffs but decreased by 13 per cent in non-maquiladora industries with less complete elimination. In other words, the observed narrowing of the gender earnings gap was largely restricted to those sectors where tariffs had been completely eliminated by 1999. While the study concludes that evidence of the negative relation between trade liberalisation and gender earnings differentials in urban Mexico suggests that WTO agreements have the potential to improve the relative economic position of women in developing countries, it should be added that trade liberalisation was also associated with overall low and falling living standards of workers more generally in the export-oriented sectors as employers were driven to cut costs.

2.3 Economic growth, gender, wellbeing and rights

A second group of studies explored the impact of growth-related variables on various measures of women's human capital, wellbeing and rights. As we noted earlier, as well as investigating the impact of gender inequality on economic growth, Dollar and Gatti (1999) also explored the impact of economic growth on gender inequality using a number of different measures: female secondary educational attainment, controlling for male; life expectancy at birth, as a measure of overall health inequalities; an index of women's legal

economic rights (equal pay legislation); marriage rights (equality of sexes within marriage and divorce proceedings); and political rights (the number of women in parliament; the year women were given the right to vote). Along with economic growth as an explanatory variable, the study also included dummy variables for religious affiliation and geographical region to capture the influence of cultural differences on gender equality. They found a convex relationship between per capita income growth and gender inequality in secondary educational attainment: gender equality in secondary education increased with increasing levels of per capita income. Increasing economic growth at low to lower middle levels of income appeared to have very little impact on gender equality but as countries moved from lower middle to higher income levels, gender equality began to improve rapidly (the income threshold appeared to be \$2000 per capita PPP). These results held even when income was treated as endogenous. The explanation provided by the authors refers to the existence of market failures in developing countries which inhibited investment in girls' education but which were likely to fade as countries progressed to higher levels of income.

A similar convex relationship was found in the relationship between economic growth and other measures of gender inequality, namely, economic equality before the law and number of women in parliament. The convex pattern was less evident in relation to gender inequalities in life expectancy, although the relationship with economic growth was strongly negative. In addition, the study found gender inequalities tended to be higher in countries with majority Muslim, Shinto (a proxy for Japan) and Hindu populations and in Latin America, suggesting 'culture' plays an important role in determining gender equality outcomes in different countries.

Baliamoune-Lutz (2007) examined the impact of economic growth on gender inequality in literacy rates among youth and adults in 62 countries over the period 1990-1999, with 30 countries coming from SSA and 32 from non-SSA countries. Other control variables in her study of interest here were trade openness, the share of manufacturing in GDP, women's share of the labour force, a dummy variable for Islam as the majority religion and an index for democracy. The estimation was carried out separately for SSA and non-SSA countries in her sample. The results suggested that not only did economic growth and trade liberalisation fail to improve gender differentials in literacy rates in SSA countries, but that - in most specifications - they increased gender inequality. It had been noted by Blackden *et al.* (2006) that absolute growth in education has been slower in SSA than other regions so that the absolute levels of educational attainment were now, unlike previously, lower than that in South Asia (exceptions were some Southern African countries and Uganda). These findings additionally suggest that growth in female education was slower than that of male.²⁴ The period covered were structural adjustment years in SSA and the findings fit with the observation made by Buchman (1996) in her review of the impact of structural adjustment policies that as 'low-income households develop strategies to enhance income and trim expenses, teenage girls become more likely than teenage boys to see their educational opportunities curtailed' (1996: 23). However, women's share of the labour force reduced gender inequality in literacy rates while inequalities were also lower for countries that started out with higher initial income.

A different set of results were reported for the non-SSA countries in her sample. Only the dummy variable for Islam proved significant and was associated with higher levels of gender inequality. Neither growth nor openness to trade nor the female share of the labour force appeared to have any significant impact on gender inequality in literacy rates. The study concluded that economic growth and globalisation had very different – and largely negative –

²⁴ This apparently counter-intuitive result is partly supported by Wood and Ridao-Cano (1999) who found that greater trade openness had a negative impact on school enrolment rates in developing countries while Vijaya (2007) presents empirical evidence that these effects are gendered, with female enrolment in secondary schools more negatively affected by trade openness than male rates, potentially due to SIE concentrations in low-skilled export production that relies primarily on female labour.

implications for gender inequality in literacy rates in SSA compared to its insignificant effect in other countries in the world but that female share of the labour force had a favourable impact. The author points to the importance of co-ordinating socio-economic policies along with trade and growth enhancing policies.

The optimistic assumption that economic growth will yield improvements in gender equality and women's wellbeing has also been challenged by Seguino in a number of studies. In Seguino (2006b) she used the Standardised Indicator of Gender Equality (SIGE) developed by Dijkstra (2002) as her measure. This is a composite index which combined five measures of relative wellbeing: gender disparities in education, life expectancy, labour force participation, senior occupational positions and parliamentary seats. Seguino compared the correlation between economic growth and the SIGE index for different quartiles of the per capita income distribution for 101 countries for the period 1980-1995. First of all, she found that there was generally a positive correlation between the SIGE and 1995 per capita GDP: in other words, within each quartile, better off countries reported higher SIGE values. However, she also found that the correlation between per capita GDP growth between 1980 and 1995 and SIGE was negative for the lowest two quartiles – particularly the second lowest quartile – and positive for the higher two quartiles with the largest correlation for the highest quartile. In other words, economic growth was negatively related to gender equality in the lower income countries so that the countries that grew most rapidly within these groups recorded far less progress on gender equality. She concluded that using too broad a brush in investigating the relationship between economic growth and gender equality ran the risk of overlooking how this relationship was likely to be mediated by very different economic structures and macro-economic policies to give very different results for different groups of countries.

In an article in 2006, Seguino studied the impact of GDP growth in Latin America and the Caribbean on gender inequality using panel data spanning over 1970-2000 (2006a). She used three measures of gender inequality: female to male population ratio; ratio of female to male gross secondary school enrolment; and ratio of adult female to male mortality rates per 1000 - relative to the reference population of Sweden. Along with measures of economic growth, the structure of the economy, its openness to trade and government expenditure, she also included women's share of the labour force as a broad measure of their bargaining power. She found that economic growth had a significant negative impact on female to male population ratios while value added in manufacturing and services as share of GDP and the growth rate in government expenditure had a significant positive effect. The female share of the labour force was positive but not significant: it was possible that the female-intensive employment effects of structural change were already captured by variables measuring changes in the economic structure. Growth rates also proved insignificant as far as ratio of male to female gross secondary school enrolment rates were concerned. The impact of the ratio of manufacturing value added was positive and significant while the ratio of trade to GDP proved negative and significant. In other words, the shift to manufacturing appeared to increase investments in female education possibly via the increase in women's work opportunities. Finally, economic growth led to a rise in female to male mortality as did increases in the share of debt to GDP but women's share of the labour force and growth in government expenditure both reduced this ratio.

Speculating as to why economic growth appeared to reduce the ratio of females to males in the population while raising female to male mortality rates, Seguino suggests that the answer may lie in the type of growth or characteristics of the growth process. If growth results in increased economic security and job flexibility due to processes of globalisation that make capital more mobile, women may be bearing the costs of economic insecurity to a greater extent and this is likely to hold back improvements in women's relative wellbeing. On the other hand, assuming that the positive impact of the shift to manufacturing on female to male population ratios and secondary educational attainment, and given the positive impact of the

female share of the labour force on female survival chances relative to male, Seguino concludes: 'Despite the fact that female share of the labour force includes both employed and unemployed women as well as paid and unpaid work, it is clear from these results that women's economic activity improves their well-being. Whether the bargaining power that this confers on women to negotiate with male members of the family, or because women directly generate income, the effect is positive and significant in most cases here' (2006a: 21).

Seguino (2002) examined the association between growth rates and changes in indicators of the quality of life of women relative to men in eight Asian countries between 1970-90. The indicators were female share of paid work force, female to male secondary school enrolment, male to female mortality levels, female to male population ratios, female to male educational attainment and decline in fertility. Using the Borda rule to rank countries according to growth rates and changes in women's wellbeing, she found that the association was weak. Indeed, in some versions of the ranking exercise, growth appeared to be negatively related to relative improvements in women's wellbeing. The first tier NIEs in the study, South Korea, Singapore and Hong Kong, achieved less in terms of gender equity per unit of growth, than the slower growing and poorer economies of Sri Lanka and the Philippines.

In the next stage of the analysis, she used various regression techniques to estimate the relationship between economic growth and the ratio of women to men in country populations for the period 1970 to 1990, arguing that the ratio represented the most important summary reflection of society's valuation of women since it captured different investments in the nutrition, health care and overall survival chances of females relative to males within the population. Her model included women's share of employment and female literacy rates as measures of empowerment while male literacy rates were included as a control.

The results suggest that growth in per capita income had a positive impact in two of the three estimates and a negative impact in the third but was not statistically significant for any of the three. Overall government expenditure as a share of the GDP had a negative impact while share of public education had a positive impact on the indicators but the results were generally not significant. Male literacy rates had an unexpected negative and statistically significant impact for all three models. The only variables that were both positive and statistically significant for all three models were women's share of the labour force and literacy rates, both of which can be regarded as improving their bargaining power.

As we noted earlier, Bussmann (2009) included an investigation of the impact of trade openness on different aspects of women's human development, female life expectancy relative to male and female enrolment rates at primary, secondary and tertiary levels, controlling for male. Her study found that trade openness had no impact on women's life expectancy, either in absolute terms or relative to that of men but per capita income levels, population size, female secondary schooling enrolment rates and democratic regimes were all associated with higher levels of female life expectancy, holding male levels constant, while fertility rates had a negative impact. Male life expectancy was positively associated with female, suggesting that the two changed together. The study found some evidence that trade openness increased female enrolment at primary and secondary levels in absolute terms but not relative to men: in other words, it did not reduce gender inequality. It is not clear why this part of her analysis was not conducted separately for OECD and non-OECD countries since, given the earlier discussion in this section, we might expect the impact of growth and trade liberalisation to have worked differently in the two contexts.

Forsythe *et al.* (2000) used cross-country and longitudinal data for the 1970–1997 period to investigate the implications of growth on a measure of gender inequality which used an adjusted version of the UNDP's Gender-related Development Index. Along with changes in per capita GDP, their explanatory variables included a dummy for countries with majority Muslim populations, a regional dummy for Latin America and various measures of structural

adjustment²⁵ to test the ongoing debate as to whether adjustment measures had reduced or exacerbated gender inequality. Cross sectional analysis suggested that gender inequalities in the early 1990s tended to be higher in countries with higher rates of per capita GDP, in countries with Muslim majority countries and in the Latin America region but only the dummy for Muslim majority countries proved significant for 1997 data. The level of economic development proved less significant in explaining differences in gender inequality in the later period.

Longitudinal analysis for the period 1970-1990 suggested that the decline in gender inequalities was greater in countries with higher levels of inequality in 1970 and lower levels of per capita development. It also suggested a curvilinear relationship between economic growth and gender inequality in that economic growth was most likely to be accompanied by a decline in gender inequality in countries which started out with lower levels of per capita GDP. Estimation of this relationship for the 1970-1997 period gave a different picture in that it is now countries with higher levels of GDP at the start of the period that report the greatest declines in gender inequality. Economic growth was no longer relevant to trends in gender inequality. Muslim majority countries and the Latin American region report lower declines in gender inequality for both estimations. Measures of structural adjustment policies had little impact on gender inequality – with the exception of educational expenditures: countries spending more on education in 1997 experienced greater declines in gender inequality over this period. The relative significance of exports in national economies, often used as a measure of globalisation, also did not appear related to changes in gender inequality.

2.4 Summing up

It is evident that there is less convergence in the findings of different studies with regard to the impact of economic growth on gender inequality however it is measured, than there was with regard to the impact of gender equality on growth. The impact of growth appears to vary considerably across different economic contexts as well as different measures of gender inequality. For instance, economic growth and trade liberalisation appear to lead to a decrease in the gender wage gap in wealthier countries but trade liberalisation had a significant negative on female relative to male employment. By contrast, neither growth nor trade nor FDI flows had much impact on the gender wage gap in poorer countries but trade liberalisation did lead to an increase in female labour force participation rates relative to male, particularly where it was accompanied by a rise in the share of exports.

Similarly, while economic growth appeared to have a positive impact on various measures of gender equality in wellbeing, such impacts were primarily confined to wealthier countries. Particularly within the Asian context, but also in Latin America, economic growth appeared to be accompanied by a deterioration in physical well-being (as measured by male female mortality differentials and the sex ratio of the overall population) while in SSA it was associated with a decline female education relative to male during the 1990s.

As might be expected, 'cultural' variables have a significant impact on gender inequality. Gender inequalities continue, in most regions of the world, to reflect long-standing norms and values that govern relations between men and women in different socio-economic groups. While the 'clash of civilisations' literature has led to a singling out of Islam as a proxy for highly patriarchal societies, the studies here suggest that its impact is not always negative nor is it the only religion with a negative impact. Countries with majority Hindu and Shinto religions were also likely to report higher than average levels of gender inequality on certain measures. Important to note in this connection is Seguino's finding that 'religiosity' or the close adherence to religious practices explains variations in gender equality to a much

²⁵ These included extent of fiscal deficit, magnitude of public sector, taxes on trade etc.

greater extent than any particular religion, although she does not explore whether certain religions encourage a greater degree of religiosity.

However, the findings discussed here also remind us that gender inequalities are not immutable but can be acted on by a variety of forces, including those associated with economic growth. One of the striking findings emerging from these studies is the importance of improvements in women's bargaining power in improving the gender-distributional impacts of growth. Where women have gained employment and education, whether as a result of growth or public policy, the implications for a broad range of gender equality measures appears to be far more positive. Such findings support Seguino's finding in relation to her work in Latin America and the Caribbean that, while bearing in mind that not all jobs held by women are equally or even necessarily empowering, at the aggregate levels at least, it appears that increasing women's share of paid jobs and access to education improves their well-being and, we might add, perhaps also their rights.

The importance of women's access to paid work at this aggregate level is confirmed by a number of other studies. Seguino's own analysis of data from the World Values Survey Analysis suggests that an increase in women's share of employment over time appears to lead to the weakening of restrictive gender stereotypes about women's roles in society (Seguino 2007b). This finding held for women and, to a lesser extent, for men, regardless of their class background. Economic growth also had a similar impact, suggesting that cultural resistance to gender equality is lessened by the general expansion of economic opportunities. In addition, an unpublished study by Cueva (2005) found that women's literacy rates and access to non-agricultural employment had a strong negative impact on a composite measure of reproductive health risks while Anker (2005) found that women's share of non-agricultural employment was significantly associated with women's access to more senior positions in the occupational hierarchy, more so than levels of per capita GDP.

3 Conclusion

3.1 Methodological concerns

In this concluding section, we draw out a number of key points from the preceding analysis that have a general bearing on the inter-relationship between gender equality and economic growth. The first set of points relates to methodological concerns. As we noted at the outset, there are major problems with the kind of cross-country regression analysis which makes up the bulk of studies discussed in this paper. For instance, it is possible that the correlations observed between the dependent and independent variables of interest - or their lack thereof - reflect unobserved variables that could not be factored into the model. Cross-country regressions report average effects for all the countries included in a study but it is highly unlikely that the average effect will be the same for each individual country because of variations in these unobserved variables. Barring country level data, these average effects simply represent the best guess of individual country effects.

A second problem relates to the recurrence of a limited number of measures of gender inequality in the economic growth models. The focus on human capital in endogenous growth theory meant that the earlier models drawing on this tradition focused on gender disparities in education, while later models have gender inequality in labour market outcomes, but what continues to be absent from these estimations are other measures of gender inequality which are likely to be relevant to growth: for instance, inequalities in land, savings and credit. While this reflects the absence of internationally comparable data on

these variables, their omission does mean that the developmental potential of addressing these other forms of gender equality go unexplored. A further complication is introduced by the fact that the impact of gender equality appears to vary depending on whether the focus is on 'livelihoods inequality' which tend to be captured by 'fast moving variables with notable short run effects' (such as wages, assets, employment) or on 'capabilities inequality' which are captured by variables such as educational attainment, health, and so on 'which (are) likely to be transmitted to the macroeconomy with a substantial lag' (Seguino and Were 2013: 5).

A third methodological problem relates to the failure to factor in women's unpaid labour in the domestic domain (Seguino 2013; Fontana and Natali 2008). This means that we remain in the dark about the direct or indirect growth impacts of what is going on in the unpaid reproductive economy. For instance, it may be that the re-allocation of women's labour from unpaid activities (which are not counted in estimates of growth) into paid activities (which are) is simply a matter of redefinition with very little impact on either the overall productivity of labour or women's bargaining power. It may be that greater gender equality in the distribution of responsibilities for unpaid care work within the home frees women up to spend more time in productive activities so that the observed increase in gender equality in the labour force is made possible by a hidden increase in gender equality within the home. Or, alternatively, if the gender distribution of unpaid work does not adjust to women's greater participation in the labour market, greater gender equality in labour force participation with its positive implications for growth will be accompanied by greater gender inequality in overall work burdens.

Finally, we noted the problems relating to direction of causality, a problem of particular relevance to the focus of this paper since we would expect to see a recursive relationship between economic growth and gender equality, with economic growth leading to greater gender equality and gender equality in turn contributing to economic growth. Some studies do incorporate techniques to take this into account and clearly estimation techniques and model specifications can be improved upon but they are unlikely to fully overcome this problem.

The usefulness of such studies – and a review of this kind – therefore lies in the fact that it allows us to establish the strength of evidence for gender-related empirical regularities across countries. These can then be used as a point of departure for lower level studies that will provide a richer, and more contextualised understanding of the dynamics of economic growth at country level. An alternative approach for 'grounding' the findings of macro-level research in country level contexts is suggested by Appiah and McMahon (2002) who use detailed micro-level evidence to illuminate the each 'impact' of gender inequality in education on economic development. However, as Appiah and McMahon (2002: 29) point out, these do not include longer-term feedback effects: 'they tend to be piecemeal and normally only related to the specific sub-groups of the population, or to some countries and not to others, and most seriously often eliminate or ignore the indirect and the long delayed feedback effects'.

3.2 Empirical findings

A second set of points relate to the empirical findings emerging from this review and the asymmetry in the relationship between gender equality and economic growth. Despite the recursive relationship posited between the two, causality seems to be stronger in one direction than the other: we find fairly robust evidence that greater gender equality, particularly in education and employment, contributes to economic growth, but much weaker and less consistent evidence for the reverse relationship relating to the impact of economic

growth on gender equality. We speculate here on why this might be the case by drawing together some of the evidence discussed in this paper.

Why does greater gender equality in education and employment contribute so systematically to economic growth?

The answer to this question appears to lie in the existence of two independent pathways through which increasing gender equality might translate into economic growth, one dependent on reasonably functioning markets and hence the level of development, the other operating largely through family relationships and hence effective in a wider variety of contexts. Increasing women's education and employment expands the pool of talent available to an economy, but its impact on growth via the market route will depend on the extent to which their education translates into employment opportunities and on the kind of employment opportunities available to them. If markets are weak or missing, if the only form of work that women can find is unproductive and poorly paid, or indeed not paid at all, it may not count for very much in the GNP.

By contrast, family-mediated impacts are less contingent on market conditions. Investments in women's education enhance their cognitive capacity and voice within the family and can be brought to bear on their reproductive responsibilities, regardless of whether or not it increases their productivity as workers.²⁶ The likelihood of this effect is supported by a large body of evidence at the micro-level which shows that women's education is associated with a variety of outcomes within the family which have positive implications for the future generation of workers, parents - and citizens.²⁷ In fact, it is possible that it is the longer-term, family-mediated route that largely explains the positive impact of female education on economic growth in low-income countries. While Klasen (2002) found that the impact of increasing female education relative to male was larger in African countries in his sample, Appiah and McMahon (2002) report that the indirect feedback effects of education on growth in Africa appeared to exceed the direct, market-dependent effects. The greater importance of the direct effects of education in OECD countries suggests that indirect pathways give way to direct ones as countries develop.

Findings from both Baliaoune-Lutz and McGillivray (2007) and Brummet (2008) add a further nuance to this. They suggest that at lower levels of development, gender equality in literacy and primary education has a greater impact on growth than secondary or higher education, primarily because of the greater importance of female literacy for infant mortality and children's education. Esteve-Volart's study (2000) suggests that the impact of gender equality in education on growth may also change over time. In the earlier period covered by her study, when the gender gap in education was generally larger, the relationship was a linear one but in later years, as the gap grew smaller, further reductions tended to have stronger impacts in better off countries.

The evidence of the indirect effects of women's access to employment is weaker and, it has been argued, may operate in more uncertain ways, depending on how it impacts on women's bargaining power within the household. Nevertheless, there is sufficient evidence to suggest that this measure of gender equality also has the potential for promoting impacts on growth via its impacts on distributional dynamics within the family.

Furthermore, the nature of the employment in question and the degree of job segregation by sector differentiate its impact in different contexts or over time. The study by Klasen and Lamanna (2009), which included both developed and developing countries, found that

²⁶ Indeed, as we have noted, there is no necessary relationship between women's education and their employment.

²⁷ For instance, the maternal education-child mortality relationship has been described as 'boringly linear' in almost every dataset that has been studied: 'it seems that maternal education exerts an effect on child mortality at even very low levels of education, that is, no threshold of maternal education is necessary...and it continues to be effective as levels of education rise virtually indefinitely' (Basu 1994: 208).

women's share of formal employment was more significant for economic growth than their share of the overall labour force. Esteve Volart's study found that women's share of the overall labour force had greater significance for economic growth in Indian states than their share of management positions. The positive impact of women's share of management positions was almost entirely confined to the non-agricultural sector.

In the case of the gender gap in wages, qualifications relate to both structure of economy, phase of development and distribution of growth across different sectors. As some of the studies cited show, gender wage gaps can, under certain conditions, contribute to the pace of economic growth. This is most likely to be the case when countries are seeking to grow through the export of highly labour-intensive and price elastic commodities, usually manufactured goods. If women's wages can be kept down in these sectors, even when their education and productivity is going up, the lower unit cost of labour increases profitability and investment. However, such strategies are most likely to work in highly patriarchal or politically repressive societies, where women can be crowded into these sectors and their bargaining power repressed. Moreover, even within these societies, such strategies are likely to only work in the early phase of export-led industrialisation when there is a relatively large surplus of female labour. As the surplus disappears, and the market for women's labour tightens, the strategy of seeking competitive advantage through the repression of women's wages may become less feasible.

Why doesn't economic growth translate more consistently into greater gender equality?

The pathways through which we might expect economic growth to translate into gender equality are both direct and indirect. An example of the first would be the expansion of women's access to economic opportunities relative to men, and hence their ability to bargain for a better deal for themselves within the family and at work. Indirect pathways include easing scarcity-related constraints which put pressure on households to discriminate against dependent members, increasing the costs of discrimination to employers as markets become more competitive and making pro-poor and gender-equitable government expenditures more affordable. None of these pathways can be taken for granted: they depend on the pace and pattern of growth, on the strength of pre-existing patriarchal constraints within the domestic and public domains and on the willingness of states to take affirmative action to offset these constraints.

For the same reasons, the impact of economic growth is likely to vary for different measures of gender equality. As we noted, women's high levels of education in the Caribbean, even exceeding that of men in some contexts, translated into higher levels of unemployment among women relative to men rather than to a closing of the gender gap in employment. The policies which had encouraged increasing levels of education for women had clearly left gender-related barriers in the labour market intact.

The importance of patterns of growth is evident from findings that suggest that women are more likely to gain jobs in the context of export-led trade liberalisation while men are more likely to lose out when trade liberalisation leads to import-intensive growth. This effect was stronger in developing countries than in OECD ones. The possibility of some 'threshold' level of per capita GDP differentiating the impact of growth between poor and better off countries is also supported by Oostendorp (2009). He found that economic growth together with trade and FDI flows led to a decline in the gender gap in wages in wealthier countries but none of these variables had much impact on the gender gap in wages in poorer countries. Such findings suggest that gender-related rigidities in the labour markets might be more pervasive in poorer countries.

Country level studies provided more detailed insights into the circumstances under which gender wage gaps were found to decline. In both South Korea and Taiwan, economic growth that was accompanied by increasing levels of female education relative to male, an increase

in women's share of professional/technical jobs and, in the case of South Korea, increasing rates of female labour force participation relative to male all contributed to a decline in the gender wage gap. However, the decline in wage gaps was partly offset in the case of Taiwan by greater ease of capital mobility and its impact on women's bargaining power in export industries. In addition, while both countries had passed legislation favouring workers, Taiwan's protective legislation for female workers served to make them more costly, unlike South Korea's minimum wage legislation.

The impact of increased exposure to international competition as a result of trade liberalisation on the gender gap in wages seems to vary by context: it appeared to intensify gender discrimination in industries that had been hitherto protected in Taiwan and India. In Mexico, on the other hand, trade liberalisation improved the relative position of women workers to men but in an overall context of falling living standards as employers were driven to cut costs in pursuit of export competitiveness.

Studies of the impact of growth on broader measures of gender equality supported the idea of a threshold effect. Indeed, Dollar and Gatti (1999) estimated that it was only among countries that had crossed a per capita income threshold of \$2000, adjusted for purchasing power parity, that further growth led to greater gender equality in secondary education, in economic equality before the law and in numbers of women in parliament. According to Balamoune-Lutz (2007), economic growth and trade liberalisation not only failed to improve gender differentials in literacy in SSA countries in the 1990s, but, in most specifications of her model, actually worsened it. While these inequalities were lower in countries that started out with higher levels of per capita income, the main variable that contributed to reducing these inequalities during the period under study was women's share of the labour force.

While Dollar and Gatti suggest that economic growth is associated with greater equality in life expectancy, the relationship appears to vary by region. For instance, Seguino found little evidence that economic growth led to greater gender equality in the health and life expectancy in her sample of Asian countries. The only variable that had a positive effect in various specifications of her model were women's share of the labour force and female literacy, controlling for male.²⁸

In the Latin America and Caribbean region, as well, it was variables relating to women's education and employment, such as value-added in manufacturing and services as a share of GDP (both sectors that had female intensive employment patterns) and women's share of the labour force, along with growth in government expenditure, rather than economic growth *per se* that helped to reduce female mortality rates relative to male and women's share of the overall population. Such findings led Seguino to conclude:

Despite the fact that female share of the labour force includes both employed and unemployed women as well as paid and unpaid work, it is clear from these results that women's economic activity improves their well-being. Whether the bargaining power that this confers on women to negotiate with male members of the family, or because women directly generate income, the effect is positive and significant in most cases here. (2006a: 21)

Issues of time and context feature as significant influences on the impact of growth on gender equality in Forsythe *et al.* (2000), who used an adjusted version of the UNDP's Gender-related Development Index. They found that the impact of economic growth on gender equality depended on initial levels of gender inequality and per capita income but this impact varied according to which period of time was included in the study. Thus estimation

²⁸ It should be noted here that analysis from India, first by Drezen and Sen (1995) and later by Klasen and Wink (2002), both support the correlation between female labour force participation rates and female literacy rates with lower levels of excess female mortality in the under-five age group in the first study and more favourable sex ratios in the second.

for the period 1970-1990 found the greatest impact of growth on gender equality was for countries that started out poorer. Extending the period of analysis to 1997 suggested that the greatest declines occurred in countries that started out with higher levels of per capita GDP. In other words, growth rates were far more gender equitable in the poorer countries up to the 1990s but were less so in the subsequent period.

Summary points

It would appear that economic development, cultural factors and policy regimes are among the critical factors determining the significance of the relationships being explored and differentiating the pathways through which these relationships operate. The positive impact of gender equality in education and employment operates largely through indirect family-mediated pathways at lower levels of development while the market-mediated pathways take on greater significance as countries develop. As a result, different levels of education may matter for activating these pathways, with literacy/primary education far more important than secondary and higher levels of education in lower income countries because of their more immediate impact on fertility levels and health-seeking behaviour.

The impact of economic growth on gender equality appears far less consistent. As we argued, gender inequality is not a purely scarcity-related phenomenon, although scarcity may contribute to it. It is the product of historically established and structurally entrenched norms, values and practices which determine the limits to women's advancement in different societies. Unless economic growth is of the kind that weakens these institutionalised constraints, we cannot expect a great deal of progress on gender equality. Economic growth that contributes directly to women's employment opportunities and generates incentives to invest in their education is most likely to achieve broad-based progress on gender equality and this effect is likely to be stronger as countries become more developed.

The time period covered by different studies makes a difference to the findings reported for at least two reasons. The first is that many of the indirect effects of gender equality on growth, not only on fertility, health and education levels, but even more indirect effects on the stability of a society, its governance structures and so on, will not be discernible in the short term. They are only likely to show up in studies which capture a longer time period. Secondly, there is a disjuncture between patterns of growth before 1980s, before neo-liberal policy prescriptions became pervasive across the world, and after the 1980s. This policy disjuncture may explain why the relationship between economic growth and gender equality appears to vary across different time periods or where countries that underwent severe debt crisis and structural adjustment measures disrupt the relationship between gender equality and economic growth in the 1990s.

We find little evidence that cultural factors, such as religion, have a direct impact on growth but we do find evidence that they may have an indirect impact via their implications for gender inequality. On the other hand, there are stronger theoretical grounds for expecting cultural variables, including religious affiliation, to have a strong impact on gender inequality, given their significance in shaping patriarchal norms and practices in different countries. The findings reported by Dollar and Gatti remind us that Islam does not have a monopoly on gender inequality. Unlike most studies which only factor in affiliation to Islam, they found that countries with majority affiliation to Islam, Hinduism and Shinto religions tend to report higher levels of gender inequality on a variety of measures than others. These are all societies belonging to what Kandiyoti (1988) has described as 'the belt of classic patriarchy' where the organisation of family and kinship practices is particularly restrictive in terms of women's economic and other life choices.

Finally, it is clear that gender gaps in education, employment and wages are not measuring the same thing and that it is important to investigate their effects separately. As the Dollar and Gatti study shows, different aspects of gender equality such as education, health and

legal status only weakly correlated, suggesting that the institutional factors governing these outcomes are not the same and therefore do not depend greatly on each other. Many countries of the world have adopted laws which promote gender equality but these laws have translated into concrete outcomes on a very uneven basis. Similarly, progress on closing the gender gap in education has not everywhere been accompanied by closing of the gender gap in labour market opportunities.

By extension, the externalities associated with female education and employment may not be the same. For instance, female education appears to have a fairly direct and predictable effect on fertility and child mortality through enhancing women's cognitive capabilities while the effect of female employment may depend on the kind of employment women gain and the extent to which it enhances their purchasing or bargaining power. Indeed, if women find it difficult to reconcile their earning opportunities with their childcare responsibilities, the impact of their employment on children's well being may be negative.

3.3 Policy implications

Drawing together the findings from our analytical review, a number of broad policy implications suggest themselves. First of all, from a growth perspective, there seems to be a strong instrumental case for investing in gender equality: much of this case rests on studies of the impact of gender equality in education and employment but in so far as this impact operates through, on the one hand, increasing women's voice and bargaining power within the family, and on the other, through maximising the productive potential of human resources within an economy, there appears to be no reason why the argument could not be extended to greater equality in access to other valued resources, such as productive assets, financial services and so on.

However, policies may have to be tailored to specific contexts. For instance, the priority may be to promote women's access to literacy and primary education in poorer countries but to offer a more diversified range of educational options, including higher education but also vocational training and skills development, once markets had begun to operate more efficiently. While in some contexts, the priority may be to get women into paid work outside the home, in others, the possibility for expanding formal employment opportunities for women may be more feasible. Promoting microfinance for women may be appropriate as a means of helping women to start up their own enterprises but access to a broader range of financial services may become necessary if these enterprises are to become profitable.

We do not have strong evidence to support the intrinsic argument for economic growth, at least in its present form. The adoption of export-oriented growth strategies in the post-1980s era has led to a reduction of the gender gap in labour force participation in many countries - along with the economic recessions and debt crises which characterised this period - but it has done little to challenge the gender-segmented nature of the labour market, leading to a greater concentration of women in poorer quality jobs relative to men and, in some cases, to higher levels of female unemployment relative to male. Nor has it done a great deal to address gender inequalities on other fronts, both market-related (such as literacy in SSA) or broader measures of human well-being and rights, such as literacy, formal rights, life expectancy and political participation.

What has made a difference is where economic growth strategies are accompanied by measures which serve to offset the discriminatory effects of specific aspects of orthodox macro-economic policy (such as instituting controls on the mobility of capital, making available low interest investment loans) or by measures explicitly aimed at addressing gender discrimination, such as affirmative action legislation, promoting women's access to education and training and so on. From a gender equity perspective, therefore, and from the

perspective of longer-term, sustainable development, current models of economic growth would either have to be re-thought or supplemented with gender-sensitive redistributive policies.

One important finding coming out of both sets of studies reviewed in this paper is the critical role of women's employment and education. These appear to have the role of 'structural catalysts': not only does greater gender equality in employment and education emerge as important determinants of growth but it also appears pivotal to the translation of growth into progress on gender equality across a broad range of fronts. This finding is also supported by a study using detailed survey data from Egypt, Ghana and Bangladesh to explore the impact of women's paid work for a range of measures of empowerment in both public and private domains (Kabeer with others 2013). While, as expected, formal employment as well as education proved most consistently empowering in all three contexts, paid work outside the home or farm was also found to have a positive impact. There has been a great deal of international interest in women's education, evident in the fact that the MDG on gender equality is formulated entirely in educational terms, but far less commitment to women's employment opportunities. On both instrumental and intrinsic grounds, this should be given higher priority.

However, in taking women's employment seriously as a policy goal, we should bear in mind that one of the major 'unobserved variables' in both sets of studies is women's unpaid reproductive work. A great deal of the work that women do does not enter the system of national accounts or official labour force surveys. We cannot tell from these macro-level surveys what happens to this work when women enter the labour force. In some cases, as we noted, it may simply reflect the fact that activities that were previously carried out on an unpaid basis are now conducted on a paid basis (rearing chickens for the market rather than home consumption). But in most other cases, the available micro-level data tells us that there is very little redistribution of unpaid reproductive work when women take up paid work, one of the reasons for their longer working days and their concentration in forms of paid work that are compatible with their domestic responsibilities.

Taking women's employment seriously as a policy goal therefore means taking their unpaid work burdens seriously. While policies that enhance women's employment and earnings capacities, they do not speak to women's domestic responsibilities and other structural impediments. In contexts where formalised markets are the norm, this would imply such public measures as parental leave policies, public provision of daycare services for young children and after-school care that will help to relieve the time and budgetary constraints that women workers, in particular, experience. Stronger enforcement of equal pay and equal opportunity legislation will reduce discriminatory pay and employment practices that contribute to the gendered impacts of macro policy reforms. These policies can help women translate greater education and labour market participation into fair wages and jobs that utilise women's skills and establish good working conditions.

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Appendix 1: Bibliographic matrix

Table - Econometric studies: impact of gender inequality on growth (or trade)

Paper	Period covered	Regions and countries (and categories of countries) covered	Basic findings	Methodology: panel, cross-country, control variables, IV	Indicators for gender inequality	Indicators for growth/(trade) (dependent variable)	Gender inequality
Dollar and Gatti (1999)*	1975-1990	Regions: EAP; ECA; LAC; MENA; SA; SSA Countries: Up to 127 Category: Distinction between less and more developed economies	For more developed economies (countries with secondary female attainment covering more than 10.35% of the population), a significant positive coefficient on female secondary attainment and an insignificant negative one on male attainment are found. The findings hold when instrumenting education. For less developed economies, both male and female secondary attainment are found insignificant.	PANEL: (OLS, 2SLS) (Four five-year periods 1975-1990) Estimation on full sample, less developed (SECF<10.35), more developed (SECF>10.35). CONTROL VARIABLES: GNP pc (log), GNP pc ² (log), rule of law, fertility, revolutions, black market premium, life expectancy (log), <i>male secondary, female secondary</i> , regional dummies (OECD, Sub-Saharan Africa; Latin America and East Asia); IV (2SLS): religion variables and civil liberties are used as instruments for male education and female education.	Share of adult women for which some secondary schooling is the highest level of attainment; share of adult men for which some secondary schooling is the highest level of attainment (adult is defined as 25 or older)	Growth of per capita income (real GDP per capita in constant dollars, expressed in international prices, base 1985)	Education
Klasen (1999) and Klasen (2002)	1960-1992	Countries: 109 Category: industrialised and developing	Gender inequality in education and employment have a significant negative impact on economic growth. Gender inequality in education does impede economic growth (the results hold using IV estimation). The impact is greater in Sub Saharan Africa. Gender inequality in education also results in higher fertility and child mortality. Gender inequality in employment leads to lower growth although here it is more difficult to sort out endogeneity.	Cross-country, panel (1960-70; 1970-80; 1980-90) Control variables: log of income per capita in 1960; Av. investment rates; Growth rate of total pop.; Av. of exports plus imports as a share of GDP; Growth rate of working-age pop. (15–64); Regional dummies (SSA, LAC, OECD, MNA, ECA); 4 education variables as described in next column. In the panel estimations only ED60 and RED60 are used (GED and RGED are not included - to avoid the simultaneity issue - and time dummies are included (60s and 70s; 80s left out). Three regressions are also estimated to measure the impact of education and gender inequality in education on population growth, labour force growth and investments that determine altogether the indirect impact of the variables of interest on economic growth. A 'reduced form' growth - excluding investments, population and labour force growth - is estimated to get the total effect of gender bias in education directly). Finally the two measures of gender inequality in employment (see next column) are added separately and alternatively to the reduced form growth regression. IV (2SLS): government spending on education, the total fertility rate in 1960 and the change in the total fertility rate between 1960-90 are used as instruments for GED and RGED.	Education 1) Number of years of schooling for the adult population in 1960 (ED60); 2) Female–male ratio of total years of schooling in 1960 (RED60); 3) Annual (absolute) growth in total years of schooling 1960-1990 (GED); 4) Female-Male ratio of the growth in tot years of schooling 1960-1990 (RGED); (adult is defined as age 15) Employment 1) growth of female formal sector employment (employees), as a share of the total number of females of working age (GEMPF in regression 6); 2) change in the share of the total labour force that is female (CHFSLs).	Average compound growth rate (Purchasing power parity-adjusted GDP per capita)	Education, employment

Klasen and Lamana (2009)	1960-2000	Regions: MENA, SSA, OECD, LAC, ECA Countries: 93	The analysis confirms Klasen (1999) with updated data (1960-2000). Gender gaps in education and employment reduce economic growth. It provides evidence that gender inequality in education reduced economic growth also during the 1990s. The panel analysis suggests that gender inequality in labour force participation (as a proxy for gender gaps in employment) has a sizeable negative impact on economic growth.	Same approach as Klasen (1999, 2002) using updated data.	See Klasen 1999.	per capita annual compound growth rate in purchasing power, parity adjusted GDP per capita	Education and employment
Esteve-Volart (2000)	1965-1989	87 countries	Evidence based on her cross-country regressions provides support for her theoretical model that predicts a convex relationship between gender inequality in education and growth. A convex relationship is found, indicating that the impact on growth is initially weak; however, as countries move towards non-discrimination (higher female-male ratio) the impact becomes stronger.	Control variables: the log of 1965 real per capita GDP; the average of the log of life expectancy at age 0 between 1960-1964; the average of the ratio of real domestic investment to real GDP between 1965 and 1985; the average of the ratio of real government consumption expenditure to real GDP between 1965-85; the average log of black market premium plus one between 1965-85; the average terms of trade shock between 1965-85; a war dummy; Sub-Saharan Africa and Latin American regional dummies. Gender inequality in education (also squared). Measure of overall education (secondary schooling). Interaction between human capital and the log of initial GDP.	Log of the ratio of the female to male primary enrolment rate in 1965.	Real per capita GDP growth over the period 1965-1989	Education
Balioune-Lutz and McGillivray (2007, 2009)	1974-2001	Regions: African and Arab region Countries: 41	Gender inequalities in literacy are found to have a statistically significant negative impact on growth. The impact is even stronger in Arab countries. In more open economies, gender inequality in literacy has an additional positive effect which suggests that trade-induced growth may be accompanied by greater inequalities. The results associated with the effects of gender inequality in primary and secondary enrolment are less robust.	Panel (Arellano-Bond GMM) (Seven periods made up of 4 year averages). Control variables: log of GDP per capita (lagged), log of investment, trade as % of GDP, democracy dummy, total fertility (births per woman); female labour force; SSA dummy; dummy for oil producing countries. The educational variables used are <i>either</i> the log of youth literacy rates (total) and the difference between absolute equality and the actual ratio of youth female to male literacy rates <i>or</i> secondary enrolment (total, gross); the difference between absolute equality and the actual ratio of girls to boys in primary and secondary education (%). The gender inequality in education variables are interacted with an 'Arab' dummy variable and with the 'openness' variable. IV: GMM (Arellano Bond estimation)	1) the ratio of girls to boys in primary and secondary enrolment, and 2) the ratio of 15-24 year-old literate females to males.	Log of GDP per capita, PPP (current international \$)	Education

Knowles et al. (2002)	1960-1990	<p>Regions: Africa, North and Central America, South America, Asia, Europe, Australasia</p> <p>Countries: 72 developed and developing countries</p>	The authors estimate the impact of male and female education on the long-run (or steady-state level) of GDP in an explicit Solow framework, where adult male and female levels of education are treated as separate factors of production. Female education impacts positively on average GDP levels while male education does not have a significant impact. Gender inequality (ratio) significantly reduces per capita income levels.	<p>Cross-section with time averaged data (1960-1990)_(OLS, 2SLS)</p> <p>Control variables (logged and averaged over the period): ratio of real physical capital investment to real GDP; adjusted growth rate of the labour force; average years of schooling attained by the population aged 15 and over disaggregated by gender; the shortfall in life expectancy at birth from 85 years; IV (2SLS) Climate variables are used as instruments for education and health.</p>	Average years of schooling (for 1960 to 1990) of female and male population aged 15 and over.	Average log of income per worker 1960-1990.	Education
Brummet (2008)	1965-1984	72 developed and developing countries (analysis by high and low income countries)	Gender differences in primary education are found to have a negative impact on long-term GDP growth. Once the analysis is carried out by sub-samples (i.e. low versus high income countries), it is noticeable that gender inequality in primary education matters more for lower income countries. The impact of gender inequality in secondary school is negative and not statistically significant.	<p>Cross-section with time averaged data (1965-1984) (OLS);</p> <p>Control variables: GDP in 1960 (log); investment/GDP in 1960; government expenditure/GDP in 1960; average years of education in adult population 1960; life expectancy 1960 (log) ; natural log of 1 plus black market premium; growth rate of the terms of trade index 1965-1985; war dummy; Latin American dummy; Sub-Saharan Africa dummy.</p>	Natural log of the ratio between men's and women's education: 1) in the total population; 2) in primary school enrolment; 3) in secondary school enrolment.	Growth rate of per capita GDP 1965-1985	Education
Forbes (2000)	1965-1995	45 countries	Female education has a positive and significant impact while the impact of male education is negative, but not significant.	<p>Panel five or ten year sub-periods (GMM);</p> <p>Control variables inequality (Gini coefficient); log of real GNP per capita, male and female education (average years of secondary schooling), market distortions (proxied by the price level of investment).</p>	Average years of secondary schooling in the female population aged over 25	Average annual growth real GNP per capita	
Esteve-Volart (2004)	1961-1991	Country level study: India (Indian states)	The ratio of female-to-male managers and the ratio of female-to-male total workers are positively and statistically significantly related to total output per capita. The negative effects of gender discrimination are particularly severe in certain sectors of the economy like the non-agricultural sector.	<p>Panel,</p> <p>Control Variables: Female-to-male managers ratio; Female-to-male workers ratio; female literacy rate; male literacy rate; population growth; ratio of urban to total population; ratio of capital to labour; scheduled tribes and scheduled castes population (%); total work force; election dummy; election turnout; political competition. IV: the ratio of prosecutions launched to the number of complaints received under the Maternity Benefits Act (1961) is used as an instrument for potential endogeneity of the gender composition of the labour force.</p>	Ratio of female-to-male managers; ratio of female-to-male workers	Log of per capita total output (then also disaggregated in agricultural and non agricultural output)	Employment (labour force participation)

Seguino (2000a)	1975-95	20 semi-industrialised export-oriented countries	The results suggest that in semi-industrialised export oriented economies where women provide the bulk of labour in the export sector, a wider gender earnings gap (coupled with a high average educational attainment) leads to higher rates of economic growth, holding everything else constant. Gender wage inequality is found to contribute to growth via the effect on exports (and therefore technological change and productivity growth) and investments.	Cross-country (period averages 1975-1995), Panel (5 year averages). Control variables: growth rate of gross domestic fixed capital formation; average years of secondary education per person 15 and over (aggregate and/or by gender depending on specification). Three measures of the gender wage gap (WGAP1-2-3) are used (one at a time) (see definition in next column). No IV.	1) WGAP1 is the difference between male and female earnings (W_m and W_f respectively); $WGAP1 = \text{Log}W_m - \text{Log}W_f$. 2) WGAP2 corrects for differences in women's and men's secondary educational attainment (SYR_m and SYR_f respectively); $WGAP2 = \text{Log}(W_m/SYR_m) - \text{Log}(W_f/SYR_f)$. 3)WGAP3 is the interaction of WGAP2 and average educational attainment in the economy.	Growth in real GDP per capita	Wage
Seguino (2000b)	1975-95	Regions: South East Asia, East Asia, South Asia, Latin America and Europe (focus on Asia) Category: export oriented semi-industrialised economies	Asian economies that have discriminated against women the most grew the fastest from 1975 to 1990. Gender discrimination and the consequent low female wages have been a stimulus to investment and exports by lowering unit labour costs, providing the foreign exchange to purchase capital and intermediate goods which in turn raise productivity and growth rates.	Panel , Cross-country. Control variables: gross domestic fixed capital formation; average total years of educational attainment per person over 15, and average years of secondary education; percentages of population (total or disaggregated by gender) 15 and over that are economically active. Two measures of the gender wage gap (WGAP1-2) are then incorporated (one at a time) and a measure for the education gap (EDGAP; see definitions in next column). No IV.	Wage 1) WGAP1 is the difference between male and female earnings (W_m and W_f respectively); $WGAP1 = \text{Log}W_m - \text{Log}W_f$. 2) WGAP2 corrects for differences in women's and men's secondary educational attainment (SYR_m and SYR_f respectively); $WGAP2 = \text{Log}(W_m/SYR_m) - \text{Log}(W_f/SYR_f)$. Education 1) EDGAP, the log difference of female and male secondary educational attainment. $EDGAP = \text{log}(SYR_m) - \text{log}(SYR_f)$.	Growth in real GDP per capita	Wage
Schober and Winter-Ebmer (2009)	1975-1995	SIEs (16+11) and other countries (from all income classes) for which meta wage data is available (27).	The authors replicate Seguino (2000a) using data from a meta-study on gender wage discrimination and find that paying lower wages to women with equal productivity does not further economic growth; if anything the impact of gender inequality is negative for growth.	Cross-country (1975-95), F.E. Panel (5 year average growth rates), Control variables: same variables as Seguino (2000a) and 3 different gender wage gap measures (see next column). In an extended model, the authors also control for openness; life expectancy at birth; exports plus imports divided by GDP; natural log of real GDP per capita. No IV.	1) raw gender wage gap (mean gender wage differential from the original studies); 2) unexplained gender wage gap (discrimination component estimated in the original studies); 3) meta wage residual (fitted values of the meta-regression)	Average growth rate of GDP	Wage

Mitra-Kahn and Mitra Kahn (2008)	1975-1995	20 export-oriented semi-industrialised countries; (late industrialisers; earlier industrialisers; Newly industrialised countries).	The relationship between gender wage inequality and economic growth is found to vary across countries depending on their level of industrialisation. A positive quadratic relationship exist between gender wage gaps and economic in countries that depend on low-skill export manufacturing. As countries move into high-skill export manufacturing, this quadratic relationship inverts: ever wider gender wage gaps are no longer associated with higher growth but some wage discrimination is. As countries grow, this optimal level of wage discrimination then moves towards 0.	Cross-country , Panel (5 year averages), Control variables : Same controls as Seguino (2000a).	Same as Seguino (2000a)	GDP growth	Wage
Busse and Spielmann (2005)	1975-2000	Regions : SSA; Asia and the Pacific; MENA; LAC; Countries/Cate gory : up to 92 developed and developing countries	Gender wage gaps are positively associated with comparative advantage in the export of labour-intensive goods, that is, countries with a larger gender wage gap have higher exports of these goods. Also, gender inequality in labour force activity rates and educational attainment rates are negatively linked with comparative advantage in labour-intensive commodities.	Cross-country (year 2000), F.E. Panel (employing data for 1975, 1980, 1985, 1990, 1995, and 2000). Control variables : Regional dummies (SSA, Asia and the Pacific, MENA, LAC, High-income countries); annual average investment of ten years before the considered period divided by land area. Total labour force divided by land area and labour inequality (see next column); Wage rate in (labour-intensive) manufacturing in current US dollars and wage inequality (see next column) ; Total educational attainment rate, based on gross secondary school enrolment rate (in %) and adult literacy rate (in %), both weighted 50% and Education inequality (see next column).	(1) Wage-inequality : 1 minus the female divided by the male wage rate in manufacturing times 100 (2) Labour inequality : relative female/male labour market activity rates for individuals, ages 15-64 (3) Education inequality relative female/male literacy rates and relative female/male gross secondary school enrolment, both weighted 1/2.	(1) Trade-exp1 Exports of labour-intensive manufactured goods divided by total exports of goods; (2) Trade-exp2 Exports of unskilled-labour-intensive manufactured goods divided by total exports of goods; (3) Trade-rca1 Revealed comparative advantage in labour-intensive manufactured goods; (4) Trade-rca2 Revealed comparative advantage in labour-intensive manufactured goods.	Wage, labour and education

Table - Econometric studies: impact of growth (or trade) on gender inequality

Paper	Period	Regions and countries (and categories of countries) covered	Basic findings	Methodology, data structure, estimator	Indicators for gender inequality (dependent variable)	Indicators for growth (and/or trade)	Gender inequality
Kapsos (2005)	1991-2003	Over 100 developed and developing countries	Kapsos estimates overall employment elasticities for the 1990s and early 2000s, disaggregated by gender, age, sector and region. Over the period 1991-2003, employment is inelastic with respect to GDP growth; however women's employment elasticities are greater than men's in all three periods (1991-5; 1995-9; 1999-2003). The author suggests export-orientation may have a positive impact on the employment intensity of growth for women; caution is however warranted on this result.	Control variables: log of GDP, country dummy variables interacted with log of GDP.	Employment by sex (log)	GDP growth	Employment
Gaddis and Klasen (2012)	1950-90; 1980-2005; 1980/1990-2005	1) Between 102 and 177 countries. Separate estimations for OECD and Non-OECD 2) 173 for sectoral value added growth; 37 for sectoral employment growth	1) Gaddis and Klasen (2012) empirically test the feminisation U hypothesis. The U-shaped relationship between aggregate GDP per capita and female labour force participation (FLFP) is not robust across different data sources and econometric specifications, particularly when the focus is on non-OECD countries. 2) The authors also assess the impacts of disaggregated sectoral growth in value added and employment (proxying for structural change) on women's economic activity. Although structural change matters for FLFP, it is only weakly linked to trends in FLFP. Different sectors generate different dynamics for women's economic activity; however, the impacts are relatively small and cannot explain the large increases in FLFP observed in most developing countries today.	For static estimates: OLS and fixed effects; for dynamic estimates: difference GMM (Arellano-Bond). (5 year intervals) Control variables: 1) log GDP pc and log GDP pc squared IV: lags of GDP used as instruments with GMM. 2) growth in value added (per capita, share-weighted) in 7 sectors.	1) FLFP rate for 3 cohorts (25-44 years old; 45-59 years old; combined 25-59 years old) 2) change in FLFP	1) GDP per capita at international PPP – [Penn World Tables (6.3 and 7.0)]	Employment

Heintz (2006)	1970-2003	Countries: 16 Categories: low- and middle-income countries	<p>This paper explores the impact of globalisation (trade policy), and changes in other macro-economic policies on women's and men's employment. It finds that women's employment is positively associated to an increase in women's employment.</p>	Panel (unbalanced), Control variables: log of current government expenditures as a % of GDP; log of exports of goods and services as a % of GDP; log of imports of goods and services as a % of GDP; log of real GDP; real short-term interest rates; employment t-1. IV: GMM-Arellano Bond estimation	The dependent are: log of total employment log of male employment; log of female employment.	Real GDP in time period t (natural logarithm); log of exports of goods and services as a % of GDP; log of imports of goods and services as a % of GDP;	Employment (labour force participation)
Bussmann (2009)	1970-2000	Regions: not indicated; Countries: 134 countries - (no list available) Category: OECD-non-OECD	<p>In developing countries, trade openness increases female labour force participation; in industrialised states, it decreases the share of working women. Trade openness in developed countries increases the number of women employed in the service sector, while in developing states it increases the number of women working in industrial jobs and in agriculture.</p>	Panel (unbalanced; F.E.; GMM). Control variables: trade openness, per capita GDP (also per capita GDP squared in the female employment regression); political regime type; fertility; population; labour force participation; female secondary schooling; (male counterparts of the dependent variables). IV: GMM (the instrument for trade openness is its value from the previous year).	Female life expectancy; primary, secondary, and tertiary school enrolment rates of females, using the gross ratio; the number of women who are active in the labour force as a percentage of the total labour force; the share of female employees in the various sectors as a percentage of total female employment.	Trade openness (total trade/GDP in log form). Other 2 specifications use log (Exports/GDP) and log(imports/GDP)	Health and education, female labour force participation, and the distribution of women working in various sectors of the economy

Seguino (2003)	1980-1999	Region: Caribbean Countries: Barbados, Jamaica, Trinidad and Tobago.	<p>This paper explores how economic cycles (booms and recessions) affect gender differentials in unemployment. Economic upturns are associated with an increase in gender inequality in job access as men are hired at a faster rate than women. Higher female than male unemployment rates are also associated with the fact that women increased their supply of labour to the market faster than men, finding consistent with job segregation by sex.</p>	<p>Pooled cross-sectional time series panel data; Panel (F.E., GLS)</p> <p>Control variables: FDI as a share of gross fixed capital formation (net capital inflows); a time trend; female share of the labour force (percentage of the female and male working age population willing and able to work); natural logarithm of the deviation of the rate of GDP growth from its trend (in other specification the economy is disaggregated in four sectors).</p>	<p>Three dependent variables: 1) female unemployment rate; 2) male unemployment rate; 3) ratio of female to male unemployment rates.</p>	<p>Natural logarithm of the deviation of the rate of GDP growth from its trend. This variable is also disaggregated by economic sector (service, manufacturing, industry and agriculture).</p>	Unemployment rates
Oostendorp 2009	1983-1999	80 countries; low and lower middle income countries; high and higher middle income countries.	<p>Regression estimates of the impact of trade and FDI on the occupational gender gap indicate that: 1) the occupational gender wage gap narrows down with increases in GDP per capita; (2) there is a significantly narrowing impact of trade and FDI net inflows on the occupational gender wage gap for low-skill occupations, both in poorer and richer countries, and for high-skill occupations in richer countries; (3) there is no evidence of a narrowing impact of trade, but there is evidence of a widening impact of FDI net inflows on the high skill occupational gender wage gap in poorer countries; and (4) wage-setting institutions have a strong impact on the occupational gender wage gap in richer countries.</p>	<p>Pooled OLS with time and occupation dummies,</p> <p>Control variables: log GDP per capita; trade (or sector trade) as % of GDP; FDI net inflows as % of GDP. Year dummies, occupation dummies; dummies for (ex) Communist; dummies for Cyprus, Japan and Korea. IV: Frankel-Romer instruments interacted with the skill level of the occupation are used as instruments for trade and FDI.</p>	Occupational gender wage gap (aggregated or disaggregated by low/high skill occupation)	Log GDP per capita; Trade (or sector trade) as % of GDP; FDI net inflows as % of GDP	Wage

Seguino (2000c)	1981 - 1992	Taiwan and South Korea	In Taiwan physical capital mobility is found to have contributed to a wider gender earnings gap. The impact of capital mobility is however different in Korea.	<p>Panel (differences in differences)</p> <p>Control variables: changes in the value of output; labour force participation rates; measures of the mobility of physical capital. Gender differentials in higher educational attainment and in percentages employed in professional/technical and managerial/supervisory; gender differentials in unemployment rates and a measure of gender segregation in the labour market (crowding). Dummy variable to capture labour market policy shifts.</p>	Natural log of monthly earnings adjusted for hours worked that includes bonuses and overtime pay.	Real log value of output, lagged one period. Three alternative measures of capital mobility: 1) total inward and outward FDI as a share of GDP; 2) total inward and outward FDI as a share of gross fixed capital formation; 3) outward FDI as a share of gross fixed capital formation.	Wage
Berik et al. (2004)	1980 - 1998	Taiwan and South Korea	Findings indicate that, in countries where female workers have lower bargaining power or higher threat of job loss, and where women are segregated into lower-paying, lower-status jobs, increasing international trade is associated with higher residual wage gaps between men and women.	<p>Cross-section and Panel (OLS, GLS)</p> <p>Control variables: import ratio, export ratio, domestic production, exchange rate, industry concentration</p>	Difference between men and women wages: average log residual wage gap	Imports, exports (trade shares)	Wage
Menon and van der Meulen Rodgers (2006)	1983 - 2004	India	Increasing openness to trade is associated with a widening in the wage gap in India's concentrated manufacturing industries.	<p>Repeated cross sections (years 1983, 1987-1988, 1993-94, 1999-2000, and 2004),</p> <p>Control variables: Three measures of trade openness used alternatively: exports/output, imports/output, and (exports and imports)/output; concentration, trade, year, concentration * year, trade * year, concentration * trade * year.</p> <p>Estimations: OLS and fixed effects</p>	Unadjusted wage gap or residual wage gap (male wages-female wages by industry in log points)	Three measures of industry-level trade openness: exports/output, imports/output, and (exports and imports)/output	Wage

Hazarika and Otero (2004)		Mexico	Findings suggest that in Mexico trade liberalisation contributed to a decrease in the gender wage gap. In particular, the gender earning differential is significantly lower in the export-oriented maquiladora sector than in the other sectors of the economy.	(OLS) Control variables: log of hours worked; married dummy; schooling; experience; formal sector dummy; gender dummy; maquiladora sector dummy; year 1999 dummy; slow liberalization dummy; a number of interaction variables; sector, occupation, firm size, region of residence dummies.	Log earnings (natural logarithm of monthly earnings in 1999 pesos).	Interaction variables: 1) Female * Maquila * 1999; 2) Female*slow liberalization*year 1999	Wage
Dollar and Gatti* (1999)	1975-1990	Regions: East Asia and Pacific; Europe and Central Asia; Latin America and Caribbean; Middle East and North Africa; South Asia; Sub-Saharan Africa Countries up to 127	Increases in per capita income lead to improvements in different measures of gender equality. A convex relationship between income and female attainment is found: the effect of income on gender inequality in education kicks in as countries reach a certain level of income (threshold \$2000 ppp per capita). A similar convex relationship is found for women's economic equality under the law and for women in parliament suggesting that as countries develop, these gender inequalities improve relatively little at first and then diminish more rapidly.	Cross-country panel (OLS, 2SLS, fixed effects) (four five-year periods 1975-1990), Control variables: GNP pc(log), GNP pc2(log), civil liberties, religion dummies (Muslim, Roman Catholic, other Christian, Hindu, Shinto); regional dummies (OECD, Sub-Saharan Africa; Latin America and East Asia). For each gender inequality regression, a control for the male level of either secondary education, life expectancy, economic equality, equality in marriage and women in parliament is added. IV (2SLS): rule of law and black market premium are used as instruments for income.	Five measures of gender equality: 1. Education (secondary): female secondary attainment (% of female or male population over 25 for whom some secondary school education is the highest level of education attained) 2. Health: Years of <i>life expectancy</i> at birth, female and male. 3. and 4. Index that ranks countries on a scale from 1-4 for different aspects of rights: Economic equality (women and men are entitled to equal pay for equal work); Legal equality (Equality of sexes within marriage and divorce proceedings); 5. Empowerment - percentage of women in parliament	Log GDP per capita and log GDP per capita squared	Education, health, economic and legal equality, empowerment
Baliemoune-Lutz (2007)	1990-1999	Regions: Africa and other developing countries Category: SSA and non-SSA countries	Globalisation (increased trade openness) and growth do not have any significant effect on gender equality (in literacy) in non-SSA developing countries. However, in SSA higher integration in world markets and growth result in an increase in gender inequality.	Cross-sectional data (5 year averages for the periods 1990–94 and 1995–99) Control variables: the female share of the labour force, initial per capita income (log) in purchasing power parity form; the share of manufacturing in GDP (value added), democracy, a dummy variable for religion (Islam ¼ 1, other ¼ 0); manufacturing share in GDP; GDP growth lagged value; openness (lagged value); SSA*openness. Estimations: OLS and 3SLS	Adult Illiteracy differential: Female illiteracy rates (% of female aged 15 and above) minus male illiteracy rates (% of male aged 15 and above); Youth Illiteracy differential: Female illiteracy rates (% of female aged 15–24) minus male illiteracy rates (% of male aged 15-24).	GDP growth (annual %) - lagged value	Education

Seguino (2006b)	1970-2000	Regions: Asia	Growth exhibits a negative effect on some well-being indicators, while growth of real government expenditures, female share of the labour force, and structural change variables exert a positive effect. Panel data analysis is also used to measure the impact of four categories of variables on trends in gender gaps in well-being — female bargaining power, structure of production, macroeconomic conditions, and government spending.	Unbalanced panel (OLS, 3SLS, fixed effects). Control variables: Total debt service as % of exports ; ratio of females to males in population; female share of labour force; growth rate of per capita GDP in \$ 1995; growth rate of total (real) government expenditures ; growth rate of gross fixed capital formation; manufacturing value-added as % of GDP (annual growth rate for manufacturing value added based on constant local currency); male to female mortality rates, relative to reference population (Sweden); ratio of female to male gross secondary school enrolment; services value-added as % of GDP; sum of exports and imports of goods and services measured as a share of GDP; annual growth rate of exports of goods and services based on constant local currency. IV: Hausmann tests indicated no evidence of endogeneity for per capita GDP growth.	Gender equity in well-being: 1) ratio of females to males in population), 2) ratio of female to male gross secondary school enrolment, and 3) relative female to male mortality rates (mortality ratio of adult female to male mortality rates per 1000 - probability of dying between the ages of 15 and 60, relative to reference population - Sweden)	Average annual GDP growth from 1970 to 2000.	Well-being
Seguino (2002)	1970-1990	Region: Asian region Countries: 8 Asian economies in 1990 (Sri Lanka, Philippines, Malaysia, Thailand, Indonesia, South Korea, Singapore, Hong Kong) Category: developing and semi-industrialised Asian countries	Economic growth does not have a significant effect on the female-to-male population ratios. Variables that affect women's bargaining power do, however, have a positive effect on relative female life chances, as does spending on public education.	Cross-country, Control Variables: growth of per capita GDP; growth in female share of labour force; female literacy rate; male literacy rate; government consumption; government expenditures on public education IV: Per capita income may be endogenous - investment as a share of GDP and exports as a share of GDP are used as instruments. Estimations: OLS, 2SLS, and fixed effects	Gender inequality in well-being: FMR - ratio of females to males in the population: number of females per 100 males in the population; and FMR in age group 0-14.	Per capita income in 1995 international dollars. It is included in the regressions as a difference operator (therefore interpreted as growth of per capita GDP) and in natural log form	Well-being: ratio of females to males in the population
Forsythe <i>et al.</i> (2000)	1970-1992	Up to 129 countries	The level of economic development has a significant and positive linear relationship with the status of women (as measured by GDI); namely, the GDI is higher in wealthy nations and lower in poorer ones. Longitudinal data provide evidence for the fact that advances in GDI were most pronounced in countries undergoing the highest rates of economic growth and with relatively lower levels of GDI in 1970. When looking at gender inequality (GI), there seems to be a curvilinear relationship between economic development and gender inequalities	Cross-section (1992; 1970-1992). Control variables: GDP per capita (and squared term), gender empowerment measure, LA dummy, prevalence of patriarchal institutional arrangements (dummy for countries where Muslim population is more than half of the total population), and a structural adjustment index. In the longitudinal analysis (1970-1992) additional controls are: the initial level of GDI or GI; initial level of GDP and growth rate of GDP between 1970 and 1992. An interaction term between the initial level of economic development (GDP per capita 1970) and growth in GDP per capita.	(1) GDI - the gender-related development index; (2)GDI components: averaged female life expectancy relative to male live expectancy; education (composite index of female adult literacy; gross combined primary, secondary and tertiary enrolment relative to males); income (composite index of females relative to males using information on wage differences and differences in the percentage shares of economically active population); (3) gender inequality (GI) is measured as (HDI-GDI)/HDI(GDI);	GDP per capita (log)	Overall; education; health; income.