

Engendering Macroeconomic Theory and Policy

Stephanie Seguino

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Abstract

Over the last 20 years, macroeconomists have increasingly given attention to the role of gender in the macroeconomy and the implications of macro-level policies for gender equality. This paper reviews the salient findings of that literature. Research shows that gender gaps in education, health, unpaid labor, employment, and wages affect the macroeconomy, influencing the rate of per capita GDP growth. The effects are transmitted via both the supply side of the economy, principally through labor productivity, and the demand side, through business spending, exports, saving, and the balance of payments. Theoretical perspectives influence which gender gaps are incorporated into models as well as how. For example, heterodox economists emphasize the demand and supply side in the short and long run, while neoclassical economists tend to focus on long-run supply-side effects.

There is widespread agreement in the literature that greater gender equality in education and employment (proxied by labor force participation rates) stimulates long-run per capita growth. Improving women's relative productivity through educational investments and facilitating their participation in paid labor serves several purposes. For example, assuming talent is equally distributed across men and women, a narrowing of gender gaps in education and employment contributes to higher average educational attainment and a more efficient allocation of labor. As educational attainment rises and women gain greater access to paid work, the opportunity cost of having additional children also rises, leading to a decline in fertility rates. Women's bargaining power within the household rises at the same time. This increases their ability to allocate household spending in ways that benefit children, and as a result, economy-wide labor productivity growth.

The weak link in this chain is that aggregate demand may be insufficient to absorb an increase in women's relative labor supply. Demand-stimulating policies as well as other policy measures may be necessary to ensure women's relative employment rate rises. Full employment policies can help to narrow the employment gap and well-targeted physical and social infrastructure investments have been found to promote women's access to paid work. Finally, traditional monetary policy—that is, the use of interest rates to manage demand and by extension, inflation, has gender-related employment effects, and exchange rate policy also influences the gender wage gap. This area of policymaking has received much less attention than fiscal policy as a tool for promoting gender equality. The paper concludes with a discussion of areas for future research.

¹ Department of Economics, University of Vermont. Email: stephanie.seguino@uvm.edu.

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I. Introduction

Interest in the unequal gender impact of macroeconomic policy surged in the 1980s and 1990s, largely influenced by the unanticipated consequences of structural adjustment policies.² Research underscored that macro-level policies might not reach their goals if their gender effects were ignored (Elson 1995).³ A body of scholarship undertaken by the International Working Group on Gender and Macroeconomics aimed at “engendering” macroeconomic and trade theory resulted in special issues of the journal, *World Development*, in 1995 and 2000. This and other scholarship has focused on identifying the impact of macro-level policies on the gender division of unpaid and paid labor. This has led to the emergence of a new subfield of gender and macroeconomics assessing two-way causality between gender relations (and disparities) and macroeconomic outcomes.

This survey paper reviews the main threads of the subfield of gender and macroeconomic literature. It looks first at research linking gender relations embedded in institutions at every level of the economy, from the household, labor, and credit markets to economic development and growth. It then reviews the reverse causality: the differential impact of macro-level policies on men and women. Following these assessments, the paper proceeds to identify topics for future research, focusing on areas where adding a gender dimension would sharpen macroeconomic models and increase the relevance of their results. Given the large body of research available, this review is not exhaustive, but instead, focuses on research publications that have significantly influenced the way we understand the two-way causality between gender and the macroeconomy.

As reviewed below, a significant portion of theoretical and empirical research finds that the degree of gender equality in education, health, unpaid labor, employment, and wages has substantial economy-wide effects. Several pathways by which gender inequalities in the household, community, and institutions affect aggregate outcomes have been identified. Effects may be transmitted to the macroeconomy in the short-, medium-, or long-run.⁴

Focusing first on supply-side macroeconomic effects, gender gaps in education and health are largely transmitted via their impact on labor productivity (Dollar and Gatti 1999; Knowles, Lorgelly, and Owen 2002; Klasen and Lamanna 2009; Bandara 2015). Based on the assumption that aptitudes are equally distributed across males and females, educating more boys than girls has been found to lower the average quality of those educated. This is labeled the selection bias or talent allocation problem. The result is an inefficient allocation of labor, with negative effects on economy-wide labor productivity and growth. In contrast, educational equality has been shown to have positive externalities. Greater female educational attainment lowers fertility rates, thus reducing women’s unpaid labor burden and facilitating their greater labor force participation. Additionally, as fertility rates decline, the working age population grows at a faster rate than the overall population, lowering the

² For example, public sector budget cuts led to women’s disproportionate job loss and simultaneously increased women’s unpaid labor burden.

³ Macro-level policies include traditional macroeconomic policy levers such as fiscal and monetary policy as well as policies affecting trade, foreign direct investment, capital flows, and industrial policy.

⁴ In macroeconomics, the short run (typically one year) is where at least one factor of production is fixed. In the long run (frequently estimated to be 10 years or more), there are no fixed factors of production (for example, the capital stock can change).

dependency ratio with positive effects on per capita growth.⁵

A second transmission mechanism is the impact of gender gaps in education and health on children's well-being, due to women's disproportionate responsibility for their care and greater propensity to allocate household resources to children. Agénor, Canuto, and da Silva (2010), in a review of this literature, note that better educated mothers spend more time and resources on children's health and education. Children of inadequately nourished mothers are likely to suffer from low birth rate, stunting, and intellectual impairment. More generally, a mother's health has been found to affect children's cognitive development, even *in utero*. The effects of gender equality in education and health on labor productivity and economic growth via this channel then are long run.

Greater gender equality in education can have an added positive indirect effect on children's well-being. As women's education increases relative to that of male members of the household, their fallback position and thus bargaining power within the household improves. As a result, women are better able to influence the allocation of household resources, with evidence indicating that women tend to spend a higher share of income on children than men (Haddad, Hoddinott, and Alderman 1997).

Growth can also be stimulated via a reduction in gender employment gaps. The direct effect of employment gaps between women and men results from this distortion that lowers overall labor productivity in the economy. This is a talent allocation problem in that gender discrimination in employment artificially lowers the pool of talent from which employers can draw.

There are also indirect effects of gender differences in access to employment on growth. Job opportunities for women contribute to lower fertility rates as the opportunity cost of children rises. This leads to an increase in women's bargaining power within the household.⁶ Greater bargaining power has been shown to have a positive effect on investments in children's well-being, thereby making a positive contribution to long-run productivity growth. It is important to note that educational and employment equality are mutually causative. For example, gender gaps in education contribute to gender gaps in formal sector employment, while barriers to female employment are a disincentive for families to increase investment in their daughters' education and health.

On the demand side of the economy, gender inequalities in education, wages, and employment affect consumption, saving, investment, exports, and the balance of payments, although the net effect on growth depends on the structure of the economy as well as a country's gender division of labor (Onaran 2015). Specifically, there is some evidence that

⁵ This observation applies primarily to developing economies, whereas in developed countries, fertility declines that reduce the size of the working age population combine with longer life expectancy to raise the dependency ratio.

⁶ Household bargaining refers to negotiations between (adult) household members on decisions such as the allocation of income and assets, and the division of unpaid labor. Game theoretic models, based on assumptions of non-cooperative bargaining (where preferences of adults are asymmetric), indicate that the fallback position (the next best outcome, should negotiations fail) influences a party's bargaining power to influence household resource allocations. As an example, the preferences of the party with more education, assets, or job opportunities are more likely to be reflected in household allocations of resources and time.

men and women have different consumption and saving rates, based on responsibilities for care of children, the elderly, and other dependents, and variations in sources of social insurance that can influence saving as a mechanism to smooth income (Seguino and Floro 2003). Shifts in the female share of income can have demand-side effects on the aggregate economy. In addition, investment and exports may also be influenced by various measures of gender equality, especially wages, and those effects may be positive or negative.

While some models also show that gendered job segregation can be a barrier to an efficient allocation of labor (Esteve-Volart 2004), job segregation coupled with wage discrimination can be a stimulus to short-run growth under some conditions (Blecker and Seguino 2002). This occurs particularly if women workers are segregated into jobs in export industries. The causal mechanism is that (discriminatorily) low wages that result from job segregation can stimulate aggregate demand by increasing both export demand and investment (business spending). In other words, lower relative female wages boost profits and stimulate export demand via the effect on export prices. Gender wage inequality may also improve the balance of payments, lessening the need to rely on currency devaluation to improve competitiveness.

Macroeconomic-relevant measures of gender equality differ according to a country's structure of production and stage of development. Access to resources, including credit, land, and other productive assets are particularly salient gender equality measures in agricultural economies (Blackden, Canagarajah, Klasen, and Lawson 2007). These variables affect the macroeconomy on the production side, especially by impacting agricultural output and food production, as well as on the demand side, because changes in gender equality in access to resources can stimulate investment in some forms of agriculture. The results are positive effects on food production that reduce the import bill, improving the balance of payments.

Summarizing the main findings, research shows that educational equality and labor force participation rates help to stimulate long-run economic growth. It is not clear, however, whether these variables themselves are stimulating growth, or whether they are acting as proxies for other gender variables on which we lack comprehensive data. Given results showing that gender wage equality can dampen short-run growth due to the negative effect on exports and investment, education and labor force participation variables may be capturing exploitation—that is, female wages that lag their contribution to productivity and output. More research is needed to link the size and direction of the effects of gender wage and employment equality on growth, depending on the structure of the economy and the specifics of the gender division of labor.

Theoretical research has made great strides in integrating the relevance of gender relations for understanding the role of unpaid care labor in the macroeconomy. Unpaid labor has a positive effect on the macroeconomy through its promotion of human capacities that improve labor productivity. However, a tension exists in that, because it is women who provide the bulk of such labor, their participation in the paid economy is circumscribed. And yet, as noted, gender employment gaps have been found to have a negative effect on economic growth. This tension might be addressed by publicly funded measures to reduce women's unpaid labor burden and policies that promote a more equal sharing of unpaid work between men and women. While we understand these relationships theoretically,

empirically testing models that incorporate the role of unpaid labor has proven challenging due to the dearth of sex-disaggregated time-series data on time use. Some progress has been made, however, using reduced form regressions, which find that physical infrastructure investment increases women's relative employment, likely by reducing unpaid labor time.

As this summary suggests, the research that identifies the pathways by which gender (in)equality influences macro-level outcomes in the short and long run has produced contradictory results, depending on the measure of inequality.⁷ This important point—that the type of inequality matters in terms of its growth effects—has been noted also by Van der Weide and Milanovic (2014), but not widely understood in the gender and macro literature. Theoretical perspectives influence the way that gender gaps are incorporated into models, with heterodox economists emphasizing the demand and supply side in the short and long run, while neoclassical economists tend to focus on long-run supply-side effects.

Several areas require further investigation. Many studies explore gender inequality in employment, but employment data do not specify the quality of work, including wages, job security, and other forms of compensation. Second, more research is needed to understand wage dynamics in models as well as in empirical work, a task that is hampered by the lack of sex-disaggregated wage data across time and countries. What factors, for example, explain the slow pace at which wage gaps have narrowed, despite the virtual closure of educational gaps? And what is the impact of higher relative female wages on output and employment? Does this differ according to a country's economic structure and the pattern of gender job segregation? Also, while we know more about the gender impact of some aspects of fiscal policy, such as physical and social infrastructure investment, more work is required to quantify those effects. Further, the impact of macro policies is channeled through a country's gender norms and stereotypes. How do norms and stereotypes change over time? What policies can facilitate gender-enabling changes (such as attitudes towards women's right to a job when jobs are scarce)? These questions require answers to better target and design macro-level policies.

Perhaps the largest policy research gaps remain in the conduct of traditional macroeconomic policy, especially full employment policies, monetary and exchange rate policy, and conflicts between fiscal policy and fiscal consolidation. The assumption that macroeconomic policymaking is gender-neutral requires greater scrutiny as evidenced by several of the studies reviewed in this survey. Although policymakers may not be intentionally gender-biased, the evidence shows gender-differentiated effects of macro policy.

⁷ There are now a number of detailed surveys of the gender and macroeconomics literature. See, for example, Stotsky (2006), Morrison, *et al.*, (2007), Seguino (2010), Nallari and Griffith (2011), Elborgh, *et al.*, (2013), Duflo (2012), Lofström (2012), Kabeer and Natali (2013), Bandiera and Natraj (2013), Cuberes and Teignier (2014), and Onaran (2017).

II. Theoretical Approaches to Modeling the Macroeconomic Role of Gender

Three distinct theoretical approaches to modeling the macroeconomic role of gender have emerged. Neoclassical growth models emphasize the long run.⁸ Based on assumptions of full employment and perfect competition in product and labor markets, these models focus on the supply-side effects of greater gender equality. The neoclassical approach generally builds on an augmented Solow growth model to incorporate the role of human capital:

$$Y = Af(K, H, L) \quad (1)$$

where Y is output, A is technological change, K is physical capital, H is human capital, and L is the quantity of labor. Typically, the models emphasize gender variables that influence the quality or quantity of the labor supply such as education, life expectancy, and labor force participation rates (Dollar and Gatti 1999; Knowles, Lorgelly and Owen 2002; Klasen and Lamanna 2009; Bandara 2015). While the models do not explore how gender affects technological progress (A)⁹ or the growth of the capital stock (K), they do incorporate the gender dimensions of care and reproductive labor and the implications of this on children and long-run labor productivity growth.

A second approach is overlapping generation (OLG) models, which are a type of representative agent economic model that captures the effect of household decision-making on schooling and work. OLGs permit an analysis of resource allocation and output per capita across generations, thereby capturing growth effects. Models reflect gender relations by incorporating women's time allocation between productive and reproductive work (Galor and Weil 1996; Agénor and Canuto 2012; Khera 2016; Kim, Lee, and Shin 2016). Some models incorporate bargaining power differentials between women and men that can influence the allocation of household resources, including time (Agénor and Canuto 2012). Models vary in their assumptions regarding labor market distortions, wage discrimination, and job segregation. Most assume labor market flexibility and full employment (thus ignoring demand-side effects of gender inequality). Several authors have calibrated these static, long-run models for simulation to investigate the quantitative impact of various policies.

The insights provided by many neoclassical growth and OLG models are circumscribed in their application to the policy realm as they extrapolate from real world macroeconomic problems such as aggregate demand deficiencies and balance of payments crises, which are regular occurrences in macroeconomies that produce feedback effects, which in turn alter gender relations. To some extent, these vagaries are accounted for in the third theoretical approach, Keynesian/Kaleckian short- and long-run growth models that incorporate the role of aggregate demand in influencing output and employment. A distinct feature of such models is their allowance for excess capacity and thus unemployment. These models also account for imperfectly competitive product and labor markets and differentiated saving

⁸ One weakness of long-run models is that they ignore short-run fluctuations in output and employment and, as a result, can miss the impact of hysteresis that exerts long-run negative effects on productivity growth. This is due to the harmful health and psychological effects of prolonged unemployment that reduce labor productivity. The decline in labor productivity in turn raises prices and further lowers output in the future.

⁹ One exception is Seguino (2000b).

rates by sex. Short-run models engender the macroeconomic equilibrium condition in an open economy:

$$S + T + M = I + G + X \quad (2)$$

where S is saving, T is taxes, M is imports, I is business spending, G is government spending, and X is exports. To “engender” a macroeconomic model in this way refers to the modeling of macroeconomic aggregates so as to capture the impact of a change in relative female/male well-being (such as wages or access to credit) (Braunstein 2000; Blecker and Seguíno 2002; Seguíno 2010; Braunstein, van Staveren, and Tavani 2011).

For example, gender differences in savings propensities affect levels of consumption and saving, and therefore demand. Gender differences in the marginal propensity to import similarly affect the import bill and balance of payments in these models. Gender gaps in access to agricultural resources may also affect food production and therefore the import bill in subsistence agriculture economies. On the investment side, gender wage and employment gaps have a positive impact on profits and therefore investment in some types of economies. There are similar positive effects on export demand, especially when coupled with gender-segregated employment.

These models can be used to assess the total effect of a shift in gender equality, based on the impact on each macroeconomic aggregate, allowing for both positive (demand-stimulating) effects as well as negative (contractionary) effects. This category of models typically focuses on variables that are amenable to change in the short run, such as gender gaps in wages and employment. The models differentiate economies by their economic structure and corresponding gender division of labor. They are structuralist macro models insofar as they reflect the variation in the impact of gender by economic structure and stage of development.

Long-run Kaleckian models have been developed as well, and are distinguished by separate functions for aggregate demand and output growth, allowing for divergence (Seguíno 2010).¹⁰ They differ from neoclassical approaches in incorporating a variety of forms of gender inequality, including fast-moving variables such as wages and employment, as compared to slower-acting variables such as gender differences in education.

The discussion below identifies the methodologies and major findings on the macroeconomic impact of gender disparities in education, employment (often proxied by labor force participation rates), wages, and job segregation.

A. Neoclassical Solow Growth and OLG Models

1. Education

A large theoretical and empirical literature explores the effect of gender equality in education

¹⁰ This refers to the Harrod-Domar model, whereby actual growth rates may diverge from warranted growth rates.

on growth. There are several channels by which educational equality is hypothesized to stimulate growth. Much of this literature emphasizes the “talent allocation” or selection bias effect, discussed above, whereby gender gaps in education are hypothesized to depress economy-wide productivity (Hill and King 1995; Klasen 1999; Knowles, Lorgelly and Owen 2002; Klasen and Lamanna 2009; Balamoune-Lutz and McGillivray 2015). The models assume competitive labor markets, such that greater educational equality will be matched by a narrowing of gender wage gaps.

Another channel by which educational equality is hypothesized to affect growth is via the impact on fertility rates. Several theoretical OLG models explore the relationship between fertility and economic growth. Fertility in these models declines in response to improvements in gender educational and wage equality, both of which are assumed to raise the opportunity cost of children (Galor and Weil 1996; Lagerlöf 1999; Kim, Lee, and Shin 2016). Lower fertility rates improve the quality of labor, given that more resources are invested in the reduced quantity of children, thereby raising economy-wide productivity.

Measures of education vary in the empirical studies. Klasen and Lamanna (2009) use total educational attainment of those 25 and older as a stock variable that captures the accumulated historical gender bias in access to education. Balamoune-Lutz and McGillivray (2015), in contrast, adopt primary and secondary enrollment rates, which are flow variables. That is, they reflect gender gaps in enrollment at a point in time for a specific age group.¹¹ Their data is applied to Africa and the Middle East, a more homogenous set of countries than those in other cross-country studies. Estimation methods among the studies differ as well. Despite using different measures of education and controls that cover different time periods and countries, the studies reach the same conclusion: gender educational equality stimulates growth over the long run. The effects on growth can be very large—up to one percentage point in annual per capita GDP growth rates (Klasen and Lamanna 2009).

Overall, the positive effect on growth of gender equality in education seems to be a settled issue in the theoretical and empirical neoclassical research, but some puzzles remain. First, if educational gaps are the only explanatory gender variable in regressions, could the coefficients be capturing the effect of omitted gender variables such that educational effects are in reality smaller than estimated? This is likely, given research that shows other measures of gender equality also impact growth. Second, should the policy focus be on early childhood education? Or should it be on primary education? Secondary? Tertiary? This would be important to know for budget-constrained developing economies so that they could better target educational expenditures (Bandiera and Natraj 2013).

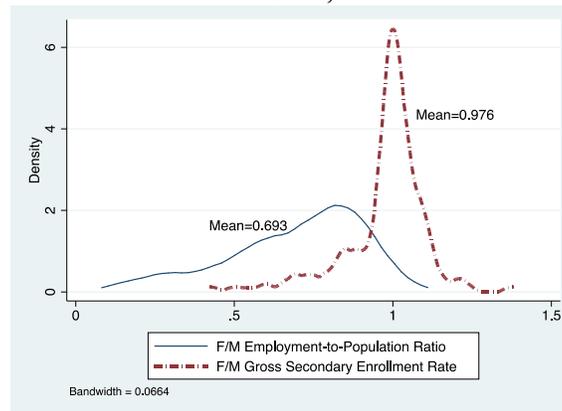
Another issue that remains unexplored is the implication of gender reversals in education. For example, in some Latin American and Caribbean countries, women’s educational attainment exceeds men’s (Duryea and others 2007). What are the growth implications of men falling behind women in formal education? Analogous problems of selection bias and lower productivity and growth may result from male educational disadvantage.

In addition, despite the narrowing of the gender educational gap, the female/male

¹¹ Just as with other stock and flow variables, we can conceptualize annual gender gaps in enrollment rates contributing to gender gaps in the stock of human capital or educational attainment.

employment-to-population rate ratios rose only modestly from 1991 to 2010 for a sample of 177 countries (Seguino 2016). Figure 1 shows the distributions of the female/male employment ratios compared to secondary school enrollment ratios in 2010. Closing educational gaps is not sufficient to ensure women’s economic empowerment via employment. Other impediments must also be addressed, including women’s unpaid labor burden and insufficient aggregate demand. Regarding the latter, Assaad, Hendy, and Yassine (2012), for example, find declining female labor force participation rates in Jordan, noting that among educated women, this is due to a deteriorating opportunity structure in the Jordanian labor market—or more simply, job shortages.

Figure 1. A Comparison of Female/Male Gross Secondary Enrollment and Employment Rate Ratios, 2010



Source: Seguino, 2016.

2. Employment, Job Segregation and Wages

A number of studies have explored the macro effects of gender differences in access to paid work. Those gaps may be the result of constrained choice at the household level due to a) women’s disproportionate responsibility for unpaid care work; b) stereotypes that steer women and men into different occupations and sectors of the economy; or c) wage gaps in favor of men (with unpaid care work obligations leading families to select the lowest-paid adult to provide this work). Gaps could also be the result of external constraints such as employer discrimination and insufficient aggregate demand and thus job vacancies.

Empirical studies primarily use labor force participation rather than employment rates as a measure of gender differences in access to paid work. A weakness of both measures is that they do not reveal hours of work, remuneration rates, or employment-related benefits. Nor do they tell us much about job quality, such as working conditions and opportunities for training and promotion. We also lack data to assess gender differences in employment in the formal versus informal sector (Heintz 2006). In many countries, a portion of employment in the informal sector is a reflection of residual unemployment and as a result, economy-wide employment rates are overestimated. This observation applies especially to developing countries. The employment data used in the studies discussed herein therefore only roughly approximate a person’s engagement with the productive sphere of the economy and the returns that yields. Labor force participation data have the same problems, with the added challenge that they obscure the employment status of a person—unemployed or employed.

These rough indicators of gender equality then should be viewed with some caution.

With these caveats in mind, several authors, using panel data for developing countries, have found that gender differences in access to work (measured as labor force participation rates) have sizeable negative effects on growth (Klasen and Lamanna 2009; Bandara 2015). Bandara (2015) uses gender gaps in effective labor—that is, the gap between male and female labor force participation rates, adjusted by the gender gap in average years of schooling—as an explanatory variable. The basic hypothesis tested is that while the gender gap in labor force participation can reduce economic growth, the combined effect of gender gaps in labor force participation and education could have even larger negative effects. Bandara’s results indicate that the gender gap in effective labor has a negative effect on economic output per worker in Sub-Saharan Africa, with annual economic losses estimated to be 5 percent of the region’s GDP.

Klasen and Lamanna (2009) enter education and labor force participation separately as explanatory variables for a cross-section of countries. They find that the inclusion of labor force participation rates as an explanatory variable (in addition to education) lowers the coefficient on the education variable. This suggests that previous studies in which regressions only accounted for gender educational gaps suffered omitted variable bias. This underscores the importance of accounting for both variables in empirical analysis. That said, Klasen and Lamanna’s coefficients change in significance, depending on the measure of education or labor force participation, so there may be some multicollinearity between education and labor force participation in the aggregate models. Given this phenomenon, Bandara’s (2015) approach may well be a preferable strategy, at least in some cases. One of the challenges of the econometric studies that link gender education and employment inequalities to growth, however, is their inability to precisely identify the causal mechanisms or pathways by which effects are transmitted, and results can be misleading. (This topic is discussed in more detail below).

While much of the neoclassical research leads us to infer that greater gender equality in education and employment raises economy-wide productivity, a critical question remains regarding the extent to which women’s greater relative productivity is reflected in higher relative female wages. It is possible that women who tend to be segregated in more labor-intensive industries in some countries, such as semi-industrialized economies with labor-intensive export sectors, or in part-time, seasonal work with less bargaining power, are unable to obtain wages commensurate with their skills. If so, the stimulus to growth may be due to the positive effect of discriminatory gender wage gaps on profits and investment.

On the theoretical side, some authors have modeled access to employment using an overlapping generations (OLG) approach, where women’s time allocation between home production, child rearing, and market work is influenced by access to infrastructure (Agénor, Canuto, and da Silva 2010; Agénor, 2012; Agénor and Canuto 2015; Agénor, Mares, and Sorsa 2015). Better infrastructure (clean water, roads, electricity) reduces women’s time spent on unpaid labor (men only do market work), thereby freeing up time to spend in remunerative economic activities (Agénor, Canuto, and da Silva 2010). In the models, children’s human capital accumulation depends on mothers’ human capital, and their health status depends on mothers’ health and time allocated to care. Women’s bargaining power relative to adult males in the family depends on the relative level of human capital, which is

itself determined by the relative amount of time mothers allocate to boys' child rearing. If more time is invested in sons than daughters in one generation, in the next generation, men's and women's human capital differ, with implications for relative bargaining power within the household.

The models assume that women have higher saving rates than men, and that saving has a positive effect on capital accumulation and growth. There is, however, a paucity of research on the topic of gender differences in saving rates, making such an assumption of questionable validity. At a minimum, more research is required to clarify this relationship. Floro and Seguino (2002) develop a theoretical model that explores determinants of gender differences in saving rates. Seguino and Floro (2003) estimate the model to determine the effects of redistribution to women (via an increase in relative wages) on aggregate savings for a set of semi-industrialized economies. Results show that a redistribution to women via higher relative female wages results in an increase in aggregate savings, suggesting women have a higher marginal propensity to save than men—at least in these economies. But this is a very specific case insofar as semi-industrialized economies are unique in terms of the combination of economic structure, the type of gender job segregation, and social norms that propel young women into the labor force but expel them when they marry.

In some societies, working married women and single mothers may have lower saving rates than men because of their responsibility for children, and for single mothers, their very low income relative to average male income. Using Kenyan household-level data, one study found that female-headed households have the highest spending multipliers with expenditures concentrated on food (Kiringai 2004). Such contradictory evidence makes it difficult to generalize about gender differences in saving rates, and points to a weakness of many studies on gender and growth. What is clear, however, is that household structure will influence gender behavior in time allocation, saving rates, and spending patterns.

The assumption of a positive effect of saving on growth is questionable because it ignores the possibility of hoarding—that saving may fail to be channeled into investment and capital accumulation. It also ignores the type of investment. Further, speculative financial investments may not positively affect growth, as demonstrated in the Great Recession of 2007-2009 in Europe and the US, and in the Asian financial crisis of 1997. Indeed, the central Keynesian claim regarding the instability of market economies is that saving only coincidentally equals investment—at least in the short run. This topic is covered below in the discussion of Keynesian/Kaleckian approaches. The more general point is that many neoclassical models of gender and growth are general equilibrium models that fail to account for macroeconomic context, and this is a major lacuna in the research.

An exception is Khera (2016), who emphasizes the role of labor market rigidities in an economy with both a formal and informal sector. A dynamic stochastic general equilibrium OLG model is used to study the impact of gender-targeted policies on female labor force participation, the gender wage gap, and aggregate economic outcomes. This is a two-good model (home and market goods, the latter consisting of formal tradable goods, informal non-tradable goods, and imported goods). Formal sector employers are modeled as having a relative preference for male workers. The model is estimated using Bayesian techniques and Indian data where informality rates are very high and female labor force participation rates have been falling.

Khera finds that policies such as those to reduce gender discrimination in formal employment increase female labor supply. However, lack of sufficient formal job creation due to labor market rigidities leads to an increase in unemployment and informality, and further widens gender gaps in formal employment and wages.¹² This outcome emerges because the model is able to capture short-run effects of policy (unlike other OLG models discussed above). Combining gender-targeted policies that lower constraints on female labor participation with reforms that boost formal job creation (through labor market deregulation), however, improves gender equality in the labor market and leads to significantly larger gains in GDP, employment, and formality.

One might very well quibble with the mechanism by which increased labor demand is induced in Khera's model. Labor market deregulation is not always associated with greater labor demand; a more important determinant of firms' willingness to hire is aggregate demand. Labor market deregulation that lowers wages may dampen spending, resulting in slower employment growth. This underscores the importance of demand management policies to stimulate employment growth, particularly in the formal sector.

Another related set of OLG models explores the growth effects of various labor market distortions or rigidities, especially job segregation, with a key assumption that men and women have the same talent distribution (Esteve-Volart 2004; Costa, Silva, and Vaz 2009; Cuberes and Teignier 2016). The theoretical models are parameterized in order to identify the size of the negative effect on economy-wide productivity. In addition, Esteve-Volart (2004) models feedback loops whereby women's limited access to jobs contributes to lower female investment in education.

One of the weaknesses of these models is their focus on occupational segregation as a micro-level phenomenon, thereby missing the important roles of macro-level factors and structural change. It is notable that gender job segregation is persistent in countries around the world (IMF 2013). Recent evidence is suggestive of increased, not decreased, job segregation. Seguino (2016) estimates the relative shares of female and male workers employed in the industrial sector (with the remainder in agriculture or services), using data for 62 countries for 1990 and 2010.¹³ Industrial sector jobs typically have higher wages, and offer more opportunity for training and job-related benefits than agricultural work and service sector jobs.

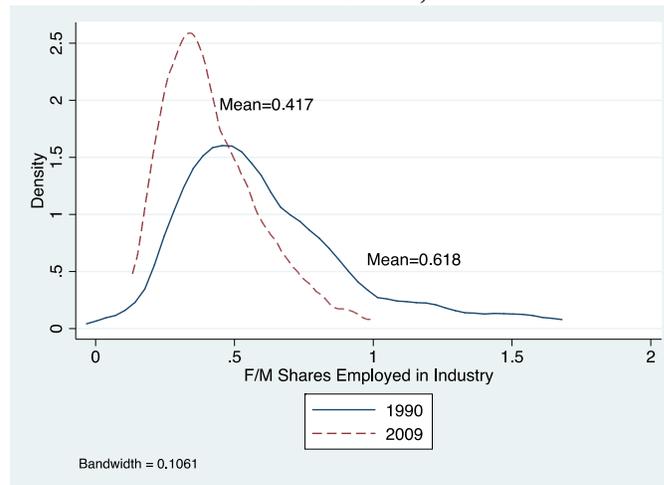
Figure 2 represents a kernel density function of cross-country distributions of the ratio of female and male shares of workers employed in the industrial sector. The distribution has shifted to the left over these two decades, with the female/male ratio of shares employed in the industrial sector falling from 0.618 to 0.417 from 1990 to 2010. By 2010, men were even more likely than women to be employed in the industrial sector, compared to 1990. The falling ratio of female to male shares is taking place in many countries where manufacturing

¹² Policies include increased investment in female education and stronger enforcement of laws against gender discrimination, thereby raising demand for female labor. On the supply side, improvements in female safety and mobility raise female labor supply.

¹³ The data are of course highly aggregated. Moreover, many of the poorest countries are not represented in this analysis due to absence of data.

employment became “feminized” in the 1980s and 1990s, such as Mauritius, Hong Kong, Morocco, and the Dominican Republic. Results are consistent with Tejani and Milberg’s (2016) research highlighting the trend of “defeminization” in the manufacturing sector in middle-income countries as the capital intensity of production rises.

Figure 2. Cross-Country Distribution of the Ratio of Female to Male Shares Employed in the Industrial Sector, 1990 and 2010



Source: Seguino (2016).

Defeminization of higher quality jobs is occurring despite narrowing gender education gaps. Why might this be happening? Given the skill demands of industrial sector jobs characterized by on-the-job learning, employers may inaccurately (or accurately) predict that men are the major breadwinners, and therefore be unwilling to hire women workers who are expected to leave the labor market at higher rates due to care responsibilities. This is more likely to occur in capital-intensive firms since the firm’s sunk costs in worker training will yield a lower return than investments in men. It could also be suggestive of ongoing gender stereotypes and the question of who has a right to a job when jobs are scarce.

Accompanying the trend of defeminization of manufacturing jobs is the evidence of premature deindustrialization (Rodrik 2016). According to Rodrik, the latter is attributable to globalization, with evidence of a decline in the relative price of manufactured goods on world markets despite productivity growth, leading to deindustrialization as well as a decline in labor demand. This “job squeeze” trend makes it more difficult to eliminate the gender employment gap.

The cause of falling manufacturing prices is worthy of additional exploration since it is macro-level dynamics such as these that structure opportunities for women to gain access to not only *a* job, but a *good* job.¹⁴ Future research seeking to understand gender inequality in employment must take into consideration to a much greater extent the macro environment, including the effects of the changing global structure of production due to trade and investment liberalization.

¹⁴ A “good” job is one that pays a living wage, provides a stable stream of income, offers safe working conditions and the possibility of upward mobility, and comes with adequate benefits.

Structural changes impact not only labor demand but also wages. Very few neoclassical studies explore the effects of structural change on gender wage gaps or the feedback effects of gender wage gaps to growth. One exception is Cavalcanti and Tavares (2016), who study how gender wage discrimination quantitatively impacts the economy over the development process. Using an OLG model, the authors posit that wage discrimination reduces female labor force participation. Output per capita falls because women choose to work fewer hours in the market. As a couple's income falls, the opportunity cost of having children declines. Fertility is thus endogenous, resulting from the degree of gender wage discrimination with higher fertility lowering per capita output.

The authors quantify the effects of gender wage inequality. They find, for example, that if gender equality were similar in the United States (U.S.) to that in Sweden, output per capita would be 17 percent higher in the U.S. than the level observed in 2000. In this case, the constraint comes from labor market discrimination with supply-side effects on growth, as compared to Agénor and Canuto (2012), where the blockage to women's economic activity is the time spent on unpaid labor.

Though the model is not designed to identify the impact of higher fertility and lower female labor force participation on the future labor supply and the resulting wage dynamics, this would be a useful extension. Indeed, all models discussed in this section suffer from a similar problem. While they are helpful in conducting thought experiments, most do not fully account for labor market and macro-level dynamics, particularly on the demand side in response to changes in the degree of gender equality.

3. Composite Measures of Gender Equality

Several studies employ a composite index to capture multiple dimensions of gender inequality (Amin, Kuntchev, and Schmidt 2015; Gonzales and others 2015; Mitra, Bang, and Biswas 2015; Hakura and others 2016; Kazandjian and others 2016). The majority use the United Nations Gender Inequality Index (GII), comprised of measures of health, employment, and political empowerment. Health is measured by maternal mortality and adolescent fertility rates. Employment is proxied by labor force participation rates, and empowerment is represented by the share of parliamentary seats and women's attainment of secondary education or more. An obvious weakness is that gender gaps in wages are not included in this index. The GII has other limitations. One component, maternal mortality rates, does not measure gender inequality (and is itself a poorly measured indicator). Also, labor force participation rates do not account for gender gaps in actual employment, the quality of work (especially wages), unpaid work, or asset ownership.¹⁵

Kazandjian and others (2016) empirically explore the effect of gender inequality on growth and income inequality using the GII. The transmission mechanism to growth is via the impact on export and output diversification (structural change), both of which are identified in the literature as drivers of sustainable growth in low- and middle-income countries. More

¹⁵ See Stotsky *et al.*, (2016), for a discussion of the strengths and weaknesses of the GII and other gender equality indicators.

specifically, gender educational equality improves the stock of human capital, which promotes the development of skill-intensive industries, and women's greater labor force participation improves the talent pool and thus a country's innovation potential. Their paper addresses endogeneity concerns, whereby structural change¹⁶ can influence the demand for female labor, using instrumental variable Generalized Method of Moments (GMM) and controlling for cyclical factors.

The authors find evidence of a two-way causality between gender equality and diversification with gender effects significant primarily in low-income countries. This interesting paper is one of the few to model the relationship between gender and structural change. It could be extended by estimating a simultaneous equation system to measure the effect of gender equality on growth, indirectly through diversification and directly via, for example, the impact on children's well-being and economy-wide productivity.

Amin, Kuntchev, and Schmidt (2015) focus on the differential impact of gender inequality on growth in rich compared to poor countries using cross-sectional data. They do this by interacting the GII with GDP per capita in 2005. The authors find a significant negative coefficient on the GII-income interaction term. This can be interpreted as evidence of a stronger negative relationship between gender inequality and economic growth at low-income levels than at high-income levels.¹⁷ Unlike the education studies discussed above which assess the impact of gender educational equality on long-run growth, measured as the total change in per capita GDP over the period in question, Amin, Kuntchev, and Schmidt (2015) simply use average values of growth rates taken over 2006 to 2008. This seems to be highly problematic given that these are financial crisis years, and such a short time span cannot account for the vagaries of business cycles. A useful extension of this study, apart from using a better measure of GDP growth, would be to decompose the GII into its various measures of gender inequality. With these caveats in mind, the finding that the effect of gender inequality on growth depends on a country's stage of development is noteworthy.

Gonzales and others (2015) employ the GII to assess the impact of gender inequality on growth as well as economy-wide income inequality using fixed effects and GMM methods on panel data, with instrumental variables to control for endogeneity. While the results indicate that the GII and its subcomponents are positively related to the net Gini index and income shares, there are serious deficiencies in their approach. Their scatterplots show the association between income inequality and the ratio of female to male labor force participation rates is close to zero for low- and middle-income countries. The relationship is only modestly significant for high-income countries. It is therefore not clear why the authors did not control for a country's level of income or separately estimate the impact of the GII by level of income.

A second concerning issue in this study is that the Gini coefficients are calculated from household surveys, thereby obscuring within-household gender income inequality. In contrast to their findings, the empirical evidence on countries for which we do have wage data show that those countries with the lowest household income inequality (many Asian

¹⁶ For example, as economies shift to a greater reliance on human capital rather than physical strength, women's job opportunities may increase (Rendall 2013).

¹⁷ Hakura and others (2016) obtain similar findings.

economies) also have the widest gender wage gaps while conversely, in Latin America where household income inequality is high, gender wage gaps are in fact relatively lower than in Asia (Seguino 2009). These results present a puzzle. Globally, income inequality has been on the rise, and gender inequality gauged by several measures has declined (Seguino 2016). This contradiction further undermines the plausibility of these results.

Third, the study does not consider how reducing gender labor force participation gaps will affect women's total working day (paid *and* unpaid work). As Elson (2016) notes, the positive impact of labor market participation may be at the cost of overwork for low-income women, thus increasing their time poverty and work intensity.

In sum, the studies discussed in this section link gender equality to growth via the following interlocking channels: greater gender equality in education and labor force participation raises economy-wide productivity both directly by improving the quality of the labor force, and indirectly via the effect on children, because women are assumed to spend more on children's education and health relative to males. Moreover, higher female education and participation rates, it is assumed, will raise female income and thereby raise the opportunity cost of children, thus lowering fertility and the unpaid labor burden. Reductions in labor market imperfections such as wage discrimination and occupational segregation are found to stimulate growth in most cases.

Several weaknesses of these studies are noted, including the failure of most models to account for the fact that adequate aggregate demand is required to ensure increases in female labor force participation are matched by sufficient labor demand. Secondly, increased employment may not reflect an improvement in women's well-being if they continue to carry the full load of unpaid labor, and if the conditions of work and remuneration are poor. And finally, the finding that an increase in relative female labor supply stimulates growth may be due in part to the effects of gender wage discrimination, which reduces the cost of labor, thus raising profits and stimulating investment (Braunstein 2012).

Beyond these highlights, two themes emerge from a review of this literature—that there is no one-size-fits-all impact of gender equality (however measured) on growth, and that research must consider a country's production mix. A later section of this paper discussing future research avenues considers this issue. It is important to note here that research needs to do more than divide countries into income groups; it must also account for the structure of production because this influences the degree of gender job segregation and gender income gaps.

B. Gender and Growth in Feminist Heterodox Macro Models

The theoretical framework adopted by many feminist macroeconomics is suited to focusing on demand-side factors influencing gendered employment and wages. This body of research is in the tradition of Michał Kalecki (1971), a contemporary of Keynes who developed a body of work that investigates how income distribution affects output, employment, and growth in demand-constrained economies. Feminist economists have adapted this framework to account for gender differences in income and employment.

The key way to engender macroeconomic models is to account for the gender division of labor in both paid and unpaid work. In addition, models incorporate gender differences in spending patterns. The gender differences are then integrated into structuralist macro models that incorporate the stylized structural features of economies (Taylor 2004). The resulting gendered macro models account for the salient features of economies: economic structure (agricultural, semi-industrialized, post-industrial); macro-level policies that influence relations with the rest of the world (rules governing trade and cross-border investment and finance); market structure (oligopolistic vs. competitive firms); trade and resulting price elasticities; balance of payments constraints to growth; key social relationships (such as intergroup inequality along ethnic lines); and the form and extent of gendered job segregation. The effects of gender relations in these models also depend on whether the models evaluate the short or the long run. Further, women's bargaining power vis-à-vis employers and their access to important resources such as jobs and credit depend on other macro-level policies, including monetary and fiscal policies.

The incorporation of the effects of household dynamics and caring labor also distinguishes these macro models. Though they share basic assumptions about household bargaining with neoclassical OLG models, they additionally evaluate the relationship between household structure, bargaining and care work on the one hand, and a country's economic structure and macro policy environment, on the other (Braunstein 2015).

Several models emphasize the interaction of gender job segregation, gender wage inequality, and the structure of production (Braunstein 2000; Seguino 2000; Blecker and Seguino 2002; Seguino 2010). Blecker and Seguino (2002) develop a model of a two-sector economy, representing conditions in many semi-industrialized economies (SIEs) where women, to the extent they gain access to paid work, are segregated in the labor-intensive manufacturing export sector while men are in non-tradables and the capital-intensive export sector. Markets are oligopolistic with firms adopting mark-up pricing. This combination of labor market and export industry structure has led to the "feminization of foreign exchange earnings" (Samarasinghe 1998). Product demand is price elastic in the female export sector, and thus higher female wages squeeze profits, while in contrast "male" goods¹⁸ are price inelastic and male wage hikes do not negatively affect profits and thus investment or employment.

The model shows that under some conditions, higher female wages contribute to a decline in export demand that is not offset by an increase in domestic demand. As such, gender wage equality can be contractionary. That is, it leads to employment output and employment losses. Both men and women are likely to be negatively affected by these job losses. However, the results depend on the model's parameters, which reflect structural features of economies as well as the impact of shifts in the distribution of income between wages and profits as well as between female and male workers. The net effect of a higher female wage is an empirical one, and depends on the country's structural features.

When the female–male wage ratio and the real exchange rate are endogenized, the model reveals the possibility for exchange rate policy to accommodate a higher female wage. This

¹⁸ "Male goods," defined as those produced in industries where men are the largest share of workers, are characteristically non-tradable (transportation, gas, electricity) or more capital-intensive (for example, steel, automobiles, and shipbuilding) than labor-intensive manufactured export goods.

model differs from Cavalcanti and Tavares (2016) in that gender wage differentials are due not only to skill or discrimination but also to economic structure and segregation, which gives women and men different bargaining power vis-à-vis employers.

Seguino (2010) extends the two-sector model approach to consider the role of gender inequality in low-income agricultural economies (LIAEs) as compared to SIEs. She incorporates both fast-acting gender variables in the short-run model (such as wages and employment) as well as those that have effects only in the longer run (various measures of capabilities). In LIAEs, it is men who are concentrated in the export sector while women work as subsistence farmers. The effects of gender equality on the balance of payments therefore differs significantly from SIEs. In LIAEs, improvement in women's well-being, access to credit, and other productive resources can raise domestic food output, reducing the demand for imports (Seguino and Were 2014).¹⁹ Because of this difference in structure and the role of women in influencing the balance of payments, gender equality stimulates growth in LIAEs in the short run. In the long-run models, gender equality is a stimulus to growth in both types of economies, which is consistent with the findings of neoclassical models discussed above.

The critical question considered in these models is how economic structure constrains the possibility for gender wage equality, with a goal of identifying nodes where public policy may be used to relax those constraints. One limitation of these models, however, is that they do not incorporate the role of social reproduction, that is the contributions of time, commodities, and money required to produce, maintain, and invest in the labor force. Social reproduction affects labor productivity in the short term by replenishing workers, and has long-run productivity effects resulting from the effect of care on human development. This work includes both paid and unpaid care work, and is gendered insofar as women are tapped to perform caring labor.

A new vein of research has emerged to explore the role of social reproduction in influencing growth (Braunstein, van Staveren, and Tavani 2011; Braunstein 2015). The analytical emphasis is on how the distributions of production and reproduction among women, men, and capital determine investment and growth and how gender inequality is both cause and consequence of these relationships. The models show that higher female wages not only directly affect aggregate demand, but also could raise labor productivity and reduce unit labor costs via greater investment in "human capacities." Unlike neoclassical models, which explore the effect of changes in the distribution of unpaid labor, this model helps to understand the endogeneity of both paid and unpaid labor and their feedback effects on the economy, taking account of demand and other structural features of economies. Results show that a win-win outcome (greater gender equality and output growth) is more likely when the following conditions hold: 1) women and men share social reproduction more

¹⁹ Numerous authors have identified the positive effect of gender equality on agricultural production. See, for example, Doss (2001) as well as summaries of this body of work in Blackden *et al.*, (2007), World Bank (2011), and Croppenstedt, Goldstein, and Rosas (2013). Noteworthy are contributions by Darity (1995) and Warner and Campbell (2000) who develop micro-level models for LIAEs with gender segregation, whereby males seek to maximize their income from export cash crop production by drawing women out of household/social maintenance activities including subsistence agriculture production. The papers explore repercussions for output in the "female" sector due to the loss of female labor power to the male-controlled export sector.

equally; 2) gender wage gaps are small; 3) an extensive high-quality paid care sector exists; and 4) there is sufficient investment in reproductive infrastructure to reduce care burdens.

Several papers empirically test the theoretical models discussed in this section. Seguino (2000) evaluates the hypothesis that education-adjusted gender wage inequality has a positive effect on growth in a set of SIEs for the period 1975-95 via the stimulus to export demand. The sample is restricted to SIEs in order to isolate the role of wages in these economies where the type of gender job segregation and economic structure differ from low- and high-income countries. The results show that GDP growth is positively related to gender wage inequality, controlling for standard variables deemed to influence growth. Congruently, Berik, Rodgers, and Lawson (2004) and Busse and Spielmann (2006) find that gender wage inequality is positively associated with comparative advantage in labor-intensive goods and thus has a positive effect on economic growth.

The effect of low female wages on exports (produced predominantly by female labor) and growth should not be surprising. These low wages could be construed as substituting for currency devaluation, a policy stance that is more widely understood to have a positive effect on export demand. More specifically, in an economy in which women are concentrated in the labor-intensive export sector, export demand is:

$$X = A \hat{e} \frac{e P_x^* \psi^Y}{\hat{e} P_x \hat{u}} W^e \quad (3)$$

where X is export demand, A is a constant, P_x^* is the foreign currency price of competing export products from other countries, ψ is the price elasticity of demand for exports, W is the level of world income, and ε is the (foreign) income elasticity of demand. The export price equation, assuming export industries employ only women and simplifying to exclude intermediate input costs, can be written as:

$$P_x = \tau [w_f b] \quad (4)$$

where P_x is the domestic price of exports, τ is the mark-up over unit costs in the export sector, and b is the labor coefficient. It is clear from equations (3) and (4) that higher female wages negatively affect export demand. Note also that declines in female wages and currency devaluation have analogous effects on export demand.

The positive effect of gender wage inequality on growth results because it is women who supply labor to the export sectors in SIEs. This result is entirely consistent with a positive effect of educational equality on growth, because higher education without commensurate increases in wages lowers unit labor costs, raises firms' profits, and stimulates exports and investment. The moral of this story is not that female wages should be suppressed in order to stimulate growth, but rather that gender wage inequality is in part responsible for the rapid growth of SIEs, especially Asian economies. Promoting gender wage equality requires development and structural change policies that would make higher female wages more compatible with growth.

Some have criticized these findings by arguing that over the long term, increased demand for female labor in SIEs will eventually close gender wage gaps. Note, however, if higher female wages dampen export demand and investment, the result is higher unemployment and thus wage stagnation. This feedback effect is the central problem to be overcome. Globalization exacerbates the problem insofar as firms are now more easily able to relocate to other lower wage countries, should wages rise. This “threat effect,” and firm mobility more generally, hold down wage growth especially in labor-intensive export industries in which women are concentrated (Seguino 2007). In any case, the evidence is not strong that discriminatory gender wage gaps are closing (Braunstein 2012). For example, despite substantial gains in education in South Korea, for example, the female wage continues to be more than 35 percent below that of men (OECD 2016), a gap that has narrowed only modestly over the last 50 years despite a strong demand for female labor. This is also the case in Brazil and other SIEs.

Mitra-Khan and Mitra-Khan (2009) have added a new twist to the gender wage inequality-export-growth nexus. They find that the relationship between the gender wage gap and growth is non-linear, and as countries move up the industrial ladder, the gender wage gap no longer has a significant effect on growth. This is a particularly interesting finding, and it could result from either gender employment discrimination in capital- and skill-intensive industries, or simply the lesser importance of the labor-intensive manufacturing sector in stimulating growth due to technological and structural changes. Tejani and Milberg’s (2016) finding of a de-feminization of employment as countries move up the industrial ladder is consistent with the latter phenomenon.

Two additional studies look at the gender wage gap’s impact on growth. Wolszczak-Derlacz (2013) evaluates this relationship for a set of developed economies for the period 1970 to 2005, analyzing the effects of wage gaps on economic output at a manufacturing sector level, as compared to country-level studies. The author finds a negative relationship between gender wage gaps and sectoral output. This empirical finding suggests that gender wage differentials may operate differently in developed economies than middle-income ones. To date, there are no formal structuralist models that incorporate social reproduction and gender in developed economies. The identification of the different pathways by which gender matters in developed economies as compared to those with differing structures and at different stages of development could be a useful area for further research.²⁰

Finally, Schober and Winter-Ebmer (2011) replicate Seguino (2000), using data from a meta-study on gender wage discrimination. They do not find any evidence that gender wage discrimination might stimulate economic growth. However, there are several problems with their analysis. First, they use gender wage residuals from wage decomposition regressions as the measure of gender wage inequality. Many of the underlying studies control for variables that are themselves indicative of discrimination (such as occupational segregation), and so the residuals are not a good estimate of gender wage gaps. Second, the underlying micro-level studies have heterogeneous sectoral coverage instead of being restricted to the export

²⁰ A starting point might be a macro model for developed economies along the lines of Stockhammer, Onaran, and Ederer (2009). Although gender is not a macroeconomic variable in their model, it presents salient structural features of developed economies that could be adopted.

sector as in Seguino (2000). In addition, the analysis does not control for countries' economic structure, which at a minimum should be interacted with the wage gap variable.

In sum, unlike the neoclassical gender and macro literature that find that all forms of gender inequality dampen growth, heterodox macro-level studies portray a more complex picture. These models differ in that they typically account not only for the unequal unpaid work burden and job segregation, but also wage gaps. The models explore the demand- and supply-side effects of these variables, which depend on the structure of production. As such, these models allow a more specific rendering of real world macroeconomies in contrast to models that assume a homogenous structure and division of labor. Heterodox and neoclassical macro models do agree, however, that gender is a salient macroeconomic variable. Moreover, because gender equality matters for growth, macro-level policies that influence gender differences in well-being at the micro-level come with feedback effects to the macroeconomy. If we ignore those feedback loops, macro-level policies could fail to achieve their goals.

III. Macro-Policy Effects on Gender Equality

One of the major contributions of gender research over the last two decades has been to delineate the two-way causality between gender inequality and macroeconomic outcomes. This paper has explored the transmission mechanisms of gender relations to the macroeconomy and now considers the reverse causality. Scholars have studied the impacts of a variety of macro-level policies on gender equality. Initially, the literature looked at the effect of economic growth on gender equality. Later, more detailed studies evaluated the effects of policies associated with globalization, especially trade, investment, and financial liberalization. More recently, studies have emphasized the effects of fiscal and monetary policies. These are discussed in turn.

A. Growth

Early cross-country studies evaluated the impact of income on gender using Two-Stage Least Squares (2SLS) and GMM estimation techniques to account for feedback loops (Dollar and Gatti 1999; Forsythe, Korzeniewicz, and Durrant 2000). Dollar and Gatti (1999) explored the effect of the level of GDP on gender equality in education and life expectancy. They found that gender inequality in education and health is to a large extent explained by dominant religion and a measure of civil liberties. The role of income is more complex. For poorer countries, there is no relationship between female educational attainment and income, after controlling for male attainment, but for higher income countries, income has a positive effect. Forsythe, Korzeniewicz, and Durrant (2000) conduct a similar analysis instead using the United Nations Development Program's (UNDP) gender-related development index (GDI) as well as its components as measures of gender equality. Finding mixed results, they note: "Gender inequalities...have been somewhat more impervious to change, and economic growth in some countries might result in rising, rather than declining, inequalities" (Forsythe, Korzeniewicz, and Durrant 2000: 608). Duflo's (2012) review of research on the relationship between gender equality and economic development arrives at a similar conclusion. From these analyses, one can draw the conclusion that economic growth

itself is not enough to overcome gender inequality. More specific and targeted policies will be required to achieve that goal.

B. Globalization Policies

The contradictory results obtained in the early growth studies highlight the fact that per capita income and growth are too imprecise as measures of macroeconomic effects on gender equality. A variety of macro-level policies can contribute to growth and their effects may conflict. A preferable methodology for capturing macroeconomic impacts is to employ as explanatory variables the specific policies in question, such as the degree of trade, investment, and capital account liberalization as measured by trade shares of GDP, foreign direct investment (FDI), and cross-border financial flows. These are reviewed in turn below. The pathways by which these three policies (which may be construed as disaggregated indicators of the degree of economic globalization) produce gender-differentiated effects are reviewed below. However, it should be noted that these policy areas are deeply intertwined, and it is also important to evaluate the collective effect of trade, investment, and financial liberalization policies on gender equality.

1. Trade and Investment Liberalization

Several studies have explored the employment and wage effects of trade and investment liberalization, the latter measured as foreign direct investment (FDI). This literature is quite large, and this survey therefore identifies some of its major findings, many of which, more than other areas, are contradictory. It is not easy to disentangle trade effects from investment liberalization; it is best instead to analyze the joint effects of these two policy variables. This is because a large share of FDI to developing countries is vertical, meaning that its purpose is to shift production to lower-cost production venues, with the intent to export to foreign markets.

Guy Standing (1989) was among the first to identify the link between trade liberalization and the feminization of global labor, referencing the increased demand for female workers due to globalization as well as downward harmonization of the quality of male jobs to those women held. He identified intensified firm competition in an increasingly globalized economy as a cause for these trends, emphasizing the search for least-cost female labor to achieve export competitiveness. Since that time, numerous studies have validated the positive effect of expansion of exports on women's relative employment in labor-intensive manufacturing and services (such as tourism and call centers) (Braunstein 2006; Aguayo-Tellez 2011; Staritz and Reis 2013).

Positive effects on women's share of employment should be viewed with some caution, however, because the data typically do not account for job quality. Heintz (2006), for example, notes that international data on employment fail to capture the full extent of informal employment. Facing intense global competition, firms have adopted flexible and informal work arrangements that are temporary, seasonal, casual, and based on unregulated labor contracts. Due to gender norms about men's role as breadwinners and women's as secondary earners, women tend to be slotted for those jobs (Carr, Chen, and Tate 2000;

Balakrishnan 2002; Benería 2007). Of course, as Standing (1989) notes, the process of informalization has also affected men, leading to a downward harmonization of labor conditions. Thus, some evidence of greater gender equality is due to men's labor market outcomes rather than women's improved conditions (Kongar 2007).

The impact of trade and investment liberalization on employment also depends on the structure of the economy. Wamboye and Seguíno (2014) empirically explore the gender employment effects of trade liberalization in Sub-Saharan Africa, dividing their sample into three types of economies: a) non-mineral non-oil exporters (NMECs), b) non-oil mineral exporters (MECs), and c) oil exporting economies. Results indicate that trade expansion has had a negative effect on women's absolute and relative employment chances in NMECs. The effects are surprisingly positive in MECs, where employment tends to be male-dominated, but are not robust across estimation methods. To further understand gender effects, Wamboye and Seguíno (2014) disaggregated trade variables into exports and imports and found that gender effects vary across sectors and countries of differing economic structures. For example, the more detailed analysis revealed that imports have a negative effect on women's relative employment rates in NMECs, but positive effects in MECs.

Consistent with these results, Bussolo and De Hoyos (2009) found that labor-intensive manufacturing jobs were lost in several African economies as a result of trade liberalization due to competition from Asia, with negative effects of women's employment. Further, in agriculture-based African economies, men have been better positioned to produce cash crops for export due to underlying asset ownership patterns and resource inequalities and gender roles in agriculture. These findings are consistent with studies that indicate trade liberalization has not been as beneficial to women and gender equality in Africa as in other regions, in contrast to Asia, where female shares of employment have risen substantially (Aguayo-Téllez 2011).

What has the empirical literature found regarding the effects of trade and FDI on gender wage inequality? Again, the results are contradictory. In a cross-national study, Oostendorp (2009) found that an increase in trade and FDI led to narrower gender wage gaps for richer countries, but not for developing economies. Given that trade and investment liberalization have increased the relative demand for female labor in developing countries, this is surprising. One might theorize that over time, gender wage gaps should narrow as a result. And yet, studies on Asian economies have found evidence that while in some cases, gender wage gaps have narrowed with increased trade and FDI, the discriminatory portion of the wage gap has increased (Maurer-Fazio, Rawski, and Zhang 1999; Liu, 2004; Berik, van der Meulen Rodgers, and Zveglic 2004; Weichselbaumer and Winter-Ebmer 2005).²¹ Menon and Rodgers (2009), using a theoretical model of competition and industry concentration, find that trade openness contributes to a widening of residual gender wage gaps in India's manufacturing industries. In Mexico, too, after initially narrowing,²² gender wage gaps have widened (Artecona and Cunningham 2002; Dominguez-Villalobos and Brown-Grossman

²¹ Berik *et al.*, (2004), however, find that gender wage gaps have widened in Taiwan.

²² Aguayo-Téllez, Airola, and Chinhui (2010) find evidence that trade liberalization (specifically, the NAFTA agreement) increased the demand for female labor in the labor-intensive manufacturing sector in Mexico and reduced gender wage inequality.

2010) in the context of a declining capital intensity of production and increased share of FDI in investment.

What might explain the failure of wage gaps to narrow with greater gender equality in education, especially in rapidly growing export-led economies that disproportionately employ women? With trade and investment liberalization, labor-intensive firms that employ primarily women have become increasingly mobile or “footloose.” The mobility of firms reduces the bargaining power of workers and thus holds down their wages (Choi 2006). Insofar as women’s employment is concentrated in mobile industries, the possibility for trade and investment liberalization to improve gender equality appears limited.

Looking beyond employment and wages to broader indicators of gender equality, Bussmann (2009) focuses on women’s absolute well-being in a study of 134 countries. The results do not support the claim that women benefit from economic integration in terms of absolute welfare gains in the form of better health. In particular, trade as a share of GDP does not have a statistically significant effect on female life expectancy. Although a large cross-sectional study like this provides interesting results, here perhaps more than other areas, country-level studies are needed, or at least controls for the structure of the economy.

Balioune-Lutz (2007) explored the triangular relationship between trade, growth, and gender differences in youth and adult literacy rates. Sub-Saharan African (SSA) trade effects are compared to those in other regions with a panel data set using OLS and three-stage least squares (3SLS) techniques. The empirical evidence indicated that globalization (measured as trade shares of GDP) and growth have had no effect on gender equality in non-SSA developing countries and a negative effect in SSA, where integration with the global economy has caused gender inequality in literacy rates to increase.

In sum, while there has been a feminization of employment in export industries that are labor-intensive, such as garment manufacturing, women are often stuck in low-wage dead-end jobs with limited opportunities for skill development. As economies move up the industrial ladder to more capital-intensive production, there is some evidence that men are the preferred labor supply with women’s share of manufacturing employment declining (see, also, Tejani and Milberg 2016). Expansion of the tourism sector and call centers provides employment for women, but often such employment is also more precarious and less well-paid than male jobs in the sector (Staritz and Reis 2013).

The most significant lesson to be drawn from this body of research is that trade and investment liberalization effects differ by country, depending on variations in the gender division of labor and the position of the economy in world trade, partly related to a country’s economic structure. Insofar as gender equality is a stimulus to growth, trade and investment policies, via their effect on wages and employment, have the potential to promote or undermine that goal. Because no one-size-fits-all trade or investment policy promotes gender equality, countries need to carefully identify how their own economic structure will be affected by policies to liberalize or regulate trade and investment, and trace out the likely gendered impacts, based on existing gendered job segregation.

2. Financial Liberalization

Financial liberalization policies have been widely adopted over the last two decades. They have emphasized the opening of capital markets to external flows and concomitantly keeping inflation rates low as a means to attract those flows. A good deal of research links the growth of household income inequality to financial liberalization (Gonzales and others 2015).

Scholars have also underscored that financial liberalization brings several problems that worsen gender equality. The following summary of problems is drawn from Elson and Cağatay (2000) as well as Braunstein (2012). First, macroeconomic volatility may increase with liberalization of capital (portfolio) flows, and women are particularly vulnerable during such times because a) they tend to have control over fewer assets and saving to smooth income during such times; b) they have greater responsibility for care of the family and cuts in public sector budgets during crisis further increase women's care responsibilities; and c) when men lose jobs during crises, women are often propelled into the labor force to take on more precarious forms of work.

Second, financial liberalization leads to a deflationary bias. That is because wealth holders' real rates of return are negatively affected by inflation. As a result, central banks in countries with liberalized capital accounts feel pressure to keep inflation low. This leads to contractionary monetary policy that has negative job growth effects. Tracing out these dynamics theoretically and empirically should be high on the priority list for gender and macroeconomics research. This work remains to be done.

A third channel by which financial liberalization may produce differential gender effects is the increased opportunity cost of maintaining a higher level of foreign exchange reserves to self-insure against a speculative attack. According to Rodrik (2006), the opportunity cost of those reserves is roughly one percent of GDP. Any analysis of the costs and benefits of capital account liberalization then would have to factor in the trade-off of holding reserves as compared their alternative use for on public sector spending. An additional cost of capital account liberalization is the impact of increased macroeconomic volatility and risk of crisis on households, especially those with few assets to smooth income, such as women. Countries must then do a cost-benefit analysis to reconcile the benefits of capital account liberalization with their substantial costs, not only to public spending, but also to vulnerable groups, such as women, most affected by economic volatility. This would suggest the importance of funding social safety net programs if financial liberalization is the appropriate policy stance, to help families, and especially women, to smooth their income. Conversely, governments may benefit from managing capital flows via a wide variety of techniques that act as "speed bumps" to reduce volatility and its subsequent costs.

3. Impact of Globalization Policies on Unpaid Labor

Floro (1995) was one of the first scholars to note the relationship between economic restructuring (induced by globalization) and gender effects of time allocation. Economic restructuring influences the distribution and intensity of women's work. Cuts in public sector budgets, for example, can increase women's care burden to replace what had been publicly

provided resources. Because time use is outside national income accounts, macroeconomists miss this important policy effect. Moreover, women may engage in “distress” sales of labor to make up for male partners’ lost income, falling wages, or the higher costs induced by devaluations. The lengthening and intensification of women’s labor time in such cases may have negative effects on children’s well-being and impose long-run economic costs. Unfortunately, the paucity of time use data make it difficult to empirically assess the impact of various macroeconomic disturbances and public sector budget cuts on gender inequality in time use.

A few studies have emerged in recent years, however, that assess the gendered impact of the Great Recession of 2007-2009 on time use in the U.S. and Turkey, respectively. Berik and Kongar (2013) find that during the U.S. recession, married mothers increased their paid hours mainly by spending less time on household tasks such as childcare, housework, and shopping. Married fathers, on the other hand, worked fewer hours in the labor market but did not take on additional unpaid work, which meant their total work hours declined. As a result, mothers and fathers worked similar numbers of paid hours. Since mothers were doing less unpaid work than previously, the recession contributed to greater unpaid labor time equality. But with the decline in their total workload, fathers had more leisure time than before the slump and relative to mothers.

Bahçe and Memiş (2013) find that increases in men’s unemployment risk directly affect their female spouses, who must then spend more time in both paid and unpaid work. Men’s time spent in paid and unpaid work also rises in response to a spouse’s unemployment, but by a much smaller amount. Using nationwide averages in absolute terms, women’s total work time rises approximately eleven times more than that of men in Turkey in response to spouses’ unemployment. While these studies do not directly assess the impact of globalization on unpaid work, there is an indirect link related to the increased volatility of macroeconomies as well as the deflationary impact of some aspects of globalization.

The critical issue is that governments, in weighing policy options, must consider the costs of globalization policies and their potential to undermine the goal of gender equality. The welfare effects of globalization policies, and in particular, the impact on women’s relative well-being, are important in their own right. However, insofar as macro-level policies that contribute to economic openness widen the degree of gender inequality, long-run growth may be hampered. This is true, even if, in the short run, there are expansionary demand-side effects of gender inequality (such as a positive effect on exports of low female wages). Understanding the two-way causality between macroeconomic outcomes and gender inequality is fundamental for the formulation of sound macro-level policies.

C. Fiscal Policy

Until twenty years ago, fiscal policy—that is, government spending and taxation—was considered gender-neutral in its effects. This perspective changed as scholarship focused on the gender impact of structural adjustment in developing countries. More recently, the financial and economic crisis of 2007-2009 and responses to it have also led to an exploration of this issue in developed economies. This paper reviews the relevant research on this topic, delineating several distinct categories of government expenditures: public

investment in physical and social infrastructure, employer-of-last-resort programs, and countercyclical and full employment policies (and their converse, fiscal consolidation or austerity).

1. Public Investment in Physical Infrastructure

Public investment typically stimulates employment as businesses hire more workers to meet increased demand. Moreover, targeted public investment can leverage or “crowd in” private investment by lowering production costs, further stimulating aggregate demand and employment growth. Because public investment can raise economy-wide productivity (Bose, Haque, and Osborn 2007; Bayraktar and Moreno-Dodson 2010), it has two beneficial features. It creates fiscal space in the long run by stimulating income growth, expanding the taxable income base. Secondly, well-targeted investment can be anti-inflationary if it addresses supply bottlenecks that drive up prices. Apart from these general effects of public investment, the state has the potential to redress inequalities and discrimination in the household, in asset ownership, and in labor markets through targeted budget allocations (Stotsky 2016).

The distributional effects of public investment in physical infrastructure have received increasing attention in recent years, with research identifying a strong link between measures of physical infrastructure, women’s unpaid care burden, employment, and the growth of potential output (Fontana and Natali 2008; Agénor, Canuto, and da Silva 2010; Fontana and Elson 2014; Seguíno and Were 2014; Agénor, Mares, and Sorsa 2015; Das and others 2015). For example, using data from Tanzanian time-use surveys, Fontana and Natali (2008) simulate the employment effects of targeted physical infrastructure investments that reduce time spent on unpaid care activities. They demonstrate that such investments, by reducing the time spent on fetching water, fuel, and other unpaid household maintenance activities, reduce the care burden and as a result, raise the earnings potential of both women and men. The results show that women benefit disproportionately from such investments. According to Fontana and Natali’s simulations, the time released from unpaid work would raise women’s income by 17.7 percent, and men’s income by 1.6 percent annually.

Using Brazilian data to simulate the effect of changes in government spending on infrastructure as a share of GDP, Agénor and Canuto (2015) find that a one percentage point increase could raise annual output growth between 0.5 and 0.9 percentage points, via the induced changes in women’s time allocation (to paid work) and their bargaining power over family resources.

These studies, however, do not estimate feedback loops from increases in women’s relative employment to other macro-level variables such as growth, the trade balance, and inflation. However, they do confirm the modeling assumption that public investment in infrastructure can promote gender equality with beneficial economy-wide effects. As such, public investment of this nature can be self-financing over the longer run due to the positive growth effects of greater gender equality. The size of effects will depend on country-level conditions, including the types of infrastructure spending and the impact on men’s and women’s time use. This is another area for further research.

The evidence does not suggest that gender gaps in employment will automatically close as a result of jobs created by physical infrastructure investment, however. Chakraborty (2010) found that in India, infrastructure investment lessened the time stress in unpaid care work, but women's employment did not increase. She concludes that complementary employment policies (of the demand-management type) are required along with infrastructure investment to ensure the substitution of market work for unpaid work. Physical infrastructure investment becomes more gender equalizing if, for instance, some of the following types of measures are incorporated: quotas for project jobs to enhance women's opportunities for employment, investments in skill training, on-site care facilities, and jobs close to home. Moreover, sufficient employment demand in the broader economy is required to absorb women as paid workers in response to reductions in time spent on unpaid care work.

The effects of public infrastructure investment on women's employment then vary and there is as yet no consensus on whether the effect is significantly positive. There is greater consensus, however, that public infrastructure investments that reduce time spent on hauling water in developing countries also have beneficial effects on children's education, and in Ghana, on girls' school attendance (Koolwal and van der Walle 2010; Nauges and Strand 2013). This growing body of research is useful both for identifying the kinds of public sector expenditures that would be beneficial for gender equality in time use and employment as well as health. Such research could also help to quantify the effects of public infrastructure investments over the long run in order to accurately evaluate a country's fiscal space for this spending.

2. Public Investment in Social Infrastructure

Due to their contributions to gender equality and long-run productivity growth, social expenditures could also be classified as infrastructure investments rather than merely discretionary spending. Investments in people's capabilities have a public goods quality with positive spillover effects on economy-wide productivity. By expanding the productive base of the economy, such investments generate a flow of revenues into the future, made easier if increases in human productivity can be converted to higher incomes. Several studies previously discussed in this paper, for example, provide evidence that closing the education gap between boys and girls has a positive and indeed sizeable effect on economic growth (Klasen and Lamanna 2009; Bandara 2015).

Social infrastructure spending can promote gender equality in another important way. Relieving women's unpaid care burden through publicly funded social services can promote gender equality in access to jobs and income. Also, gendered patterns of employment result in a greater probability that women will gain jobs in social service activities or the paid care sector of the economy, such that public spending in this area can further narrow gender employment gaps. Several studies explore the impact of social spending on job creation by gender. İlkkaracan, Kim, and Kaya (2015) investigate the potential employment effects of a 20 billion Turkish lira expenditure on childcare centers and preschools versus housing (the construction sector). They estimate that an expenditure of this magnitude in the construction sector would create a total of 290,000 new jobs while the same amount invested in childcare and preschool would generate 719,000 new jobs. Of the new jobs created via investments in the childcare and preschool sector, 73 percent would go to women, compared to roughly 6

percent of the new jobs created via expenditures on public infrastructure and housing construction.

Similarly, Antonopoulos, Kim, Masterson, and Zacharias (2010) present simulation results for the U.S. to show that investment in social service delivery sectors, such as early childhood development and home-based health care, creates twice as many jobs as the same level of expenditures on physical infrastructure (which creates jobs in construction and energy). The authors find that social service jobs are more effective at reaching disadvantaged workers and those from poor households with lower educational attainment. Thus, women are more likely to get these jobs, and amongst women who are employed, more disadvantaged women benefit the most. In terms of efficiency per dollar spent, social infrastructure spending is likely to have a larger job multiplier and greater effect on gender employment gaps than physical infrastructure spending.

Dehenau and Himmelweit (2016) develop a macro-micro input-output model for analysis of gender impacts of public policy, applying it to public investment in care for a set of advanced economies. Specifically, the model is used to assess the impact of a public investment equivalent to 2 percent of GDP in either the care or the construction sector in several advanced economies. The potential effects of such investment occur over the short term (women's unpaid work falls, more jobs are created that women can fill), medium term (wages in the care sector rise, gender wage gaps fall, and more men enter care work), and long term (gender roles become less dependent on a gender division of unpaid care work with benefits for long-run growth). The employment effects (with increases ranging from 2.4 percent to 6.1 percent) of care sector investments are considerably larger than those in the construction sector (1.8 percent to 3.5 percent). Moreover, roughly two-thirds of newly created jobs go to women in the care sector compared to one-third in the construction sector. The significance of this approach is that it addresses demand-side issues, which the International Monetary Fund (IMF) gender research on increasing women's relative labor force participation has neglected.

These results are clear that a demand-side stimulus can increase job opportunities for women and men, and when appropriately targeted, produce a differential demand for female labor. A stimulus serves the additional purpose of absorbing the increased female labor supply that results from publicly funding care services. This is especially important since efforts to create employment opportunities for women in the paid economy, if they do not address the care burden, can either fail to attain their goal or reduce women's well-being due to the "double burden" (Cook and Dong 2011). Publicly funded care services can also address the problem of the typically lower wages paid in that sector as compared to other sectors of the economy. Evidence shows that wage rates in publicly funded jobs are higher than in the private sector (Budig and Misra 2010).

Unfortunately, there are no studies of the actual impact on women and men's labor supply or time use of publicly funded care services—to include child and elder care and of the sick—in developing countries. A large body of research demonstrates that structural adjustment policies in the 1980s had a negative effect on women's unpaid care burden, in part via cuts to public sector funding on health care, food subsidies, and education. It is unclear whether social infrastructure spending is even feasible in the context of the fiscal

austerity environment. It may be, if we rely on a longer time frame than is typical in terms of the manageability of public sector deficits.

This is because social infrastructure spending can in fact create fiscal space by raising the productive capacity of the economy (Roy, Heuty, and Letouzé 2009). Much of the spending on the care sector positively affects future productivity through improving the quality of the current and future labor force by providing health care and education that make workers more productive. Heckman and Masterov (2007) identify substantial paybacks from early childhood education, for example. Such expenditures raise incomes by raising labor productivity, thereby generating tax revenues with which to pay down the debt incurred to finance the original investment.

Under current fiscal discipline rules, however, many countries are assumed to lack sufficient fiscal space to undertake public investment. The degree of space is circumscribed by limits placed on a country's public debt relative to GDP. The current approach to establishing debt ceilings defines fiscal sustainability for the short term, but this ignores the interaction between fiscal policy and growth over the longer term. This leads to an underestimation of the long-term payback to fiscal sustainability of public investment that could be debt-financed. Relatedly, current guidelines for assessing fiscal space and sustainability ignore *what* the fiscal space is used for. Most budgets classify current and capital budgets separately but this distinction is not made when evaluating fiscal deficits. The result is restrictive fiscal targets, which has led to a decline in public investment/GDP ratios in many countries.

More focused empirical research is required to effectively and rigorously demonstrate the ability of expenditures that promote gender equality in other domains (e.g., spending on health and other care expenditures) to expand medium- and long-run fiscal space. Targeted research that permits estimation of the payback of gender equality investments is pivotal to expanding the discourse and consensus on fiscal space.

3. Countercyclical and Full Employment Policies

A concerning feature of recessions is the resulting widespread destruction of jobs. How gender interacts with job losses during a recession depends on the structure of a country's economy and the sectoral nature of gender job segregation. In cases where downturns first affect demand in female-dominated labor-intensive export industries (due to a crisis among trading partners), women's job losses are likely to exceed men's. This occurred in developing countries during the Asian financial crisis of 1997 and the global downturn that resulted from the Great Recession of 2007-09. In contrast, in developed economies, the Great Recession of 2007-09, which began in the housing sector, led to job losses first hitting the construction and then manufacturing industries. Because these industries are male-dominated in employment, male job losses exceeded women's at the beginning of the recession (Pearson and Sweetman 2011).

Employment effects on women and men may differ along the trajectory from downturn to trough to expansion, however. Regardless of which sectors are first affected by job losses due to downturns, prolonged recessions that lead to strains on public sector budgets and therefore budget cuts, may have more negative effects on women than men. This is due to

women's greater employment concentration in government jobs (Grown and Tas 2011).

Prolonged recessions can also lead to hysteresis, thereby lowering long-run growth rates due to the impact on labor productivity. Insofar as gender is a stimulus to growth and well-being, the effects of macro-level phenomena such as business cycles and recessions will need to be addressed, and countervailing policies to alleviate the burdens of such downturns developed. Thus, gender-sensitive countercyclical policies are of interest.

Employer of Last Resort (ELR) programs are one example of such policies, cushioning the effects of downturns and reducing gender conflict over scarce jobs. ELR programs act as a buffer stock, and can be used to prevent deskilling and to strategically invest in infrastructure. The gender effect of such programs has been noted in the literature. A prominent program in developing countries is the Indian government's National Rural Employment Guarantee Act (NREGA). This act establishes a legal job guarantee for one hundred days of employment every year to adult members of any rural household willing to do public work (mainly unskilled) at the statutory minimum wage. Women's participation rate in the program is double their participation rate in the casual labor market, and in 2009-10 they comprised about 48 percent of those employed by this job guarantee scheme (Dutta and others 2012; Das and others 2015).

Full-employment policies more generally are an important component of any program to promote gender equality. Several studies lay out a set of macro-level policies to achieve the goal of employment (as compared to GDP) growth (Onaran 2015). Pollin and others (2006), for example, develop an employment-targeted growth strategy for South Africa, using innovative fiscal and monetary policy tools. Such programs can be tailored to target women's relatively more limited access to employment. The main tools of an employment-targeted program include loan guarantees to facilitate the expansion of credit to key sectors of the economy (such as small- and medium-sized enterprises and women farmers), asset reserve requirements to stimulate the extension of credit to firms with large employment multipliers, along with public investment in infrastructure.

D. Monetary Policy

Regardless of factors influencing monetary policy, such as financial liberalization, there are likely to be gender-differentiated effects on employment, consumption, and children's well-being with resulting feedback effects on growth. Only a handful of papers have explored the impact of contractionary monetary policy on gendered outcomes (Braunstein and Heintz 2006; Tachtamanova and Sierminska 2009; Seguino and Heintz 2012) while two papers explore the relationship between gender representation on monetary policy committees and the conduct of monetary policy (Diouf and P  pin 2016; Masciandaro, Profeta, and Romelli 2016).

Braunstein and Heintz (2006) were pioneers in this research. Using descriptive data analysis, they found that after controlling for long-term employment trends, the ratio of women's to men's employment tends to decline during contractionary inflation reduction in the majority of developing countries examined. Applying econometric analysis on U.S. data by state, Seguino and Heintz (2012) find evidence of a disproportionate increase in female relative

unemployment in response to contractionary monetary policy. In contrast, Tachtamanova and Sierminska (2009) find the link between short-term interest rates and employment in nine OECD countries for the period 1980-2004 to be weak, with no significant gender effects.

In terms of the conduct of monetary policy, Diouf and P  pin (2016) and Masciandaro, Profeta, and Romelli (2016) find evidence that gender diversity in central bank boards and chairs affects the conduct of monetary policy and hence macroeconomic outcomes. Greater relative female representation on central bank boards is inversely associated with inflation rates and money growth. Diouf and P  pin (2016) suggest that because women central bankers are more concerned with price stability than their male counterparts, they are a) more resistant than men to political pressures, and b) this could explain the underrepresentation of women as central bank chairs. These papers add to our knowledge of the role of gender in shaping key macroeconomic institutions. This issue can benefit from more research, however, to better understand a) gender preferences on inflation and unemployment²³ and b) the relationship between monetary policy in terms of short-term interest rates and other policy tools, such as asset-based reserve requirements designed to target credit to key sectors or groups (Epstein 2007).

More generally, the lack of research that more fully assesses the relationship between inflation targeting and gendered well-being is a major gap in our understanding of the relationship between macro-level policies and gender. Contractionary policies can have differential effects on employment since some industries are more interest-rate sensitive than others. When this is combined with gender job segregation, gender inequality is also affected (Seguino and Heintz 2012). The importance of this for macro models is that monetary policy is one of the feedback loops that explain gender equality, which then influences growth. In the absence of gender-aware monetary policies, governments (or more precisely, central banks) could unintentionally undermine their country's gender equality goals.

Moreover, whether it is men or women who are most negatively affected by employment losses due to contractionary monetary policies, household dynamics are affected. Some research shows, for example, that increases in female unemployment lead to greater domestic violence in the U.S. (Macmillan and Kruttschnitt 2004), the macroeconomic costs of which have been estimated to be very high in some countries (Duvvury and Carney 2012; Duvvury and others 2013). Similarly, in a study on the United Kingdom, Anderberg and others (2013) find that an increase in male unemployment decreases the incidence of intimate partner violence, while higher female unemployment increases the risk of domestic abuse. Earlier studies, based on U.S. data, however, show that male unemployment is positively correlated to domestic violence (Gelles 1980; Fagan, Stewart, and Hansen 1983). The findings may differ from the 1980s to the 2000s in response to changes in gender norms and factors that influence bargaining power, such as domestic violence legislation. It is clear that context matters and therefore, it would be erroneous to extrapolate findings from the

²³ Jayadev (2008), for example, assesses class-based preferences towards anti-inflationary and anti-unemployment policy using a cross-country social survey in 27 countries for 1996. The sample is comprised largely of developed economies. He finds that the working class and those with lower occupational skill and status are more likely to prioritize combating unemployment rather than inflation. Women report being relatively more inflation-averse than men. It would be useful to re-conduct this analysis with updated data that includes many more developing economies.

2000s in developed countries to those that are less developed. Nevertheless, it is clear that macroeconomic policies influence household dynamics in ways that affect domestic violence.

Exchange rate policy can also affect rates of domestic violence, transmitted through the impact on gender wage gaps. Munyo and Rossi (2015) explore the effect of depreciations and appreciations of the Uruguayan real exchange rate (measured as the relative price of tradable and non-tradable goods). Men are concentrated in tradable industries such as manufacturing, while women are more likely to work in non-tradable industries such as the service sector. Taking account of household bargaining dynamics, they argue that a real depreciation generates an increase in the household bargaining power of men relative to women, raising the frequency of domestic violence. Aizer (2010) comes to a similar conclusion with regard to the effect of changes in the gender wage gap on domestic violence.

Macroeconomists have not taken into account the less visible costs associated with employment loss, shifts in wages gaps, and domestic violence, and this area deserves more attention and inclusion in macro models that evaluate the relationship between gender, family dynamics, and growth.

IV. Summary and Areas for Future Research

The research reviewed here underscores the two-way causality between gender inequality and macroeconomic outcomes. It highlights the importance of viewing macro-level policies through a gender lens to make policies concordant with the goal of promoting gender equality. Given the role that gender plays in influencing macroeconomic outcomes, a lesson that emerges is that policy goals can be thwarted if gender effects are not taken into consideration.

A. Gender Equality Effects on the Rate of Growth

Research has identified several transmission mechanisms from gender equality to the macroeconomy. Education and labor force participation equality promote improvements in economy-wide productivity, via the “talent” channel as well as through impacts on children’s well-being and labor productivity growth. The results are quite robust with two caveats. Studies of the effect of gender equality in education on growth often suffer from omitted variable bias, inflating the size of the coefficients on that variable. Second, while research on gender equality in labor force participation rates shows a positive effect on growth, that variable has several weaknesses. The labor force participation rate does not capture employment, which varies over the business cycle. It especially does not capture the fact that women may engage in distress sales of labor as men’s wages fall or unemployment rises. In a related point, many studies assume that women’s lower labor force participation is determined exclusively on the supply-side, ignoring the role of aggregate demand.

Even in studies using employment data, the quality of employment is not captured, nor is the impact on gender gaps in unpaid labor. The positive effect of female incorporation into paid labor using either of these measures may result from greater burdens through the “double burden” of unpaid labor, if that is not reduced, and by incorporating women into jobs at low wages that do not reflect their productivity. Some research shows, further, that gender wage gaps are a stimulus to growth by raising firm profits and lowering the cost of exports, both short-run demand side effects. As Braunstein (2012: 15) notes, “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.” The effects of gender equality on growth, as the literature shows, depend on a country’s stage of development and structure of production.

B. Macro-Policy Impacts on Gender Equality

A variety of macro-level policies can promote gender equality. Public sector spending on physical infrastructure and social infrastructure (through public investment in care services) if well targeted could reduce the unpaid care burden, enabling women to take on paid jobs. Social spending on health and education can both reduce gender gaps in these areas *and* stimulate demand for female labor. Despite public sector budget constraints, such expenditures are likely to pay for themselves in the longer run, due to the positive feedback effects of gender equality on macroeconomic growth. Other tools exist as well, including employer-of-last-resort programs. Research shows that monetary policy—including both interest rate and exchange rate policy—also affects gender employment equality.

Finally, early on it had been argued that economic growth is good for gender equality. The results of that research, however, are very mixed and it has become clear that specific macro-level policies that promote growth that must be examined for their gender equality effects. Three that have been explored in this paper are trade, investment, and financial liberalization. In the case of trade and investment liberalization, results are mixed in terms of impacts on employment and wages, and largely related to the structure of production in a country and its underlying gender division of labor. Financial liberalization more clearly shows negative gender effects. Increased volatility of financial flows that increase the probability of crisis weighs disproportionately on women as care providers for their families. Additionally, the opportunity cost of holding reserves reduces resources available for public sector spending that could be targeted at closing gender gaps in health and education. The deflationary bias of such policies dampens employment and output growth. In the absence of sufficient demand for labor, job competition emerges, with women potentially ending up at the back of the queue with negative effects on women’s job access—or contributing to exacerbated gender tensions as men compete with women for scarce jobs.

This latter point underscores a major lacuna in this research. Policies to stimulate aggregate demand are required for labor markets to absorb women as their education rises and care burden falls. Full employment policies are necessary to ensure gender equitable access to work, thereby promoting gender equality in other domains.

C. Areas for Future Research

As this survey demonstrates, several lacunae remain in the gender and macroeconomics literature. Key areas are discussed below.

1. Gender Effects on Growth

- *Employment and wages:* Increases in female employment do not necessarily result in improved material well-being for women. The quality of work and relative rates of remuneration determine whether in fact paid work is empowering and leads to meaningful gender equality (and assuming women retain control over their earnings). It is not at all certain that just because women's relative employment rises, they are better off, given that many take on the lowest paid, least secure jobs relative to men. As such, empirical results that show a positive effect of increased relative female employment (or labor force participation) on growth could simply be capturing yet another form of relative underpayment of women for their labor. Wages are a better indicator of job quality and women's relative economic status. The challenge is the dearth of sex-disaggregated wage data, especially in services and agriculture. That said, wage data do exist, and more work should be done to incorporate those into empirical analyses. In terms of theoretical models, those that do account for gender wage gaps could benefit from more rigorous modeling. Wage dynamics in particular should be more carefully and explicitly modeled. A more complex set of behavioral equations is needed to identify macro-level sources of changes in gender wage gaps as well as the resulting feedback effects of these wage gaps on household dynamics, firm investment, FDI, and exports. How, for example, do changes in various types of FDI and trade composition affect gender wage gaps? How do changes in gender wage gaps influence the level of investment and other macro-level variables? Relatedly, efforts to explore potential efficiency wage effects of higher relative female wages are warranted.
- *Gender differences in marginal propensities to consume, save, and import:* To correctly parameterize macro models, more research is needed to estimate differences in women's and men's propensities to consume and save, and male and female producers' propensities to import. Some models assume, for example, that women have higher saving rates than men (and thus lower consumption propensities). Given the paucity of research on the topic of gender differences in saving rates, such assumptions are questionable without more concrete evidence. We also know little about gender consumption differences in import propensities, which can affect the import bill and current account in the event of a shift in the distribution of income between women and men. In addition to empirically investigating import propensities of consumers, more investigation into the impact of greater gender equality on producers, and thus the import bill, is also warranted. For example, greater gender equality among farmers could potentially increase food production and thus lower the import bill in low-income agricultural economies.
- *Economic structure and dynamic structural change:* One of the clearest lessons to be learned from this survey is that gender equality's impacts on the macroeconomy vary

depending on the measure of equality, the stage of development, and the structure of production in an economy at any point in time. Most cross-country studies lack controls for structural variables and fail to model the determinants and effects of structural change, even though it is evident that the impact of macro-level policies is filtered through a country's economic structure. It is not sufficient to simply include controls for region or income groupings (e.g., low-, middle-, and high-income). Examples of relevant structural variables are manufacturing or industry as a share of GDP, terms of trade, foreign direct investment as a share of gross fixed capital formation, and dummies for oil-exporting economies. Until this more detailed research is conducted, we do not have a clear mapping of the effect of various measures of gender equality on the macroeconomy. As noted, there are no obvious generalizations to emerge from the now substantial literature on trade and investment liberalization, in large part because effects differ depending on the structure of production. More research on how economic structure influences the effects of trade and investment policies is needed.

- *The role of men and gender conflict:* While women's relative well-being has been studied, it is often assumed that a narrowing of gender gaps implies men's well-being is held constant. And yet this is not always the case, due to the process of structural change many economies are undergoing that is affecting men's employment options. Further, as women's share of employment rises, shifts in female and male bargaining power can induce gender conflict under some conditions. The impact of this phenomenon on the macroeconomy as well as policies to attenuate this effect require further exploration.

2. Macroeconomic Policy Effects on Gender Equality

- *Demand-management, monetary, and exchange rate policies:* Demand-management policies that ensure full employment are key to gender equality in the paid economy. How to achieve that goal in a way that is gender-equalizing through fiscal as well as monetary policy is a topic that requires more research. Given that expenditures to promote gender equality can be productivity-enhancing as well, such policies could be construed as anti-inflationary. Monetary and exchange rate policies are typically assumed to be gender-neutral but at least some studies show that is not the case. Moreover, these studies have been relatively narrow in focus and the topic warrants further investigation.
- *Conflicts between public investment and fiscal consolidation:* Austerity policies emphasize the negative effects of current debt and deficits, but ignore the role that investment in gender equality may have on generating longer-run growth, thereby creating fiscal space. A more thorough investigation of the issues is warranted. More generally, a shift in the policy discussions about spending to promote gender equality that more correctly frames such expenditures as an investment is needed, given their economy-wide effects.
- *Quantification of effects of physical and social infrastructure spending:* Some meaningful progress has been made in quantifying the economy-wide effects of gender equality.

More work is needed to quantify the effects of specific policy interventions as has been done, for example, by James Heckman in estimating the benefits of early childhood education. What, for example, are the economic benefits of investments in publicly provided care services on employment and labor productivity? Can the impact of investments in physical infrastructure be quantified, such as expanded access to clean water, on women's employment and macroeconomic growth? Can loan guarantees to small women farmers be justified, based on the impact on food output and imports?

- *Gender and financial liberalization:* Capital account liberalization may lead to growth, but also to macroeconomic instability. Accounting for the costs and benefits of this policy stance then requires a full accounting of impacts by gender. Perhaps most fundamentally, financial liberalization has not been construed as a gender issue—but it very clearly is, given the disproportionate burden women bear during times of economic volatility and crisis. Research that explores the link between capital account liberalization or controls, on the one hand, and gender equality, on the other, is needed.
- *Macro-level policy and informal sector work:* The lack of good labor market data makes it difficult to identify the impact of policies on women and men's concentration in informal sector jobs. And yet, this is an area that requires much more research, especially given the trends toward informalization in many countries. While data may not be available to more intensely scrutinize the gender dimension of informal sector work, studies indicate that women are more likely to be informal sector workers. Policies that incentivize informal sector firms to register, thereby joining the formal sector, can be gender equalizing. More research to identify policies and their effectiveness would improve the policy tool kit of governments seeking to reduce gender inequality.²⁴
- *Norms and stereotypes:* Bandiera and Natraj (2013) and others have observed that educational equality has not led to the anticipated effects on employment and wage equality. The role of norms and stereotypes in inhibiting positive change requires more research, as well as policy approaches to overcome this inhibition. This work should explore how macro policy can contribute to overcoming such stereotypes. For example, as countries move up the industrial ladder to more capital-intensive production, a defeminization of industrial employment has been observed. To what extent is this phenomenon due to norms and stereotypes about gender roles, including women and technology? In what way can policies help to overcome these impediments?

²⁴ Methodologies employed thus far include theoretical models with simulations as well as input-output analysis. See, for example, Khera (2016) and De Henau and Himmelweit (2016). The latter methodology is a more accessible tool for policymakers.

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