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ABSTRACT

Over the past two decades, economists have turned their attention to exploring the role of gender in the macroeconomy. This paper reviews the salient findings of that literature. Research shows that gender gaps in education, health, unpaid labor, employment, and wages have economy-wide consequences and influence the rate of 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. In turn, a broad array of macro-level policies, including fiscal, monetary, and trade policies have differential effects by gender that, if unheeded, can undermine macro-policy goals. Their impact depends on the structure of the economy and the gender division of labor in paid and unpaid work. This survey makes clear that incorporation of gender into macro models improves the relevance of macroeconomic theory and can yield better policy results.

KEYWORDS

Macroeconomics, gender differences, structural economics

JEL Codes: E1, E5, F41

INTRODUCTION

Interest in the gendered repercussions of macroeconomic policy surged in the 1980s and 1990s, largely influenced by the unanticipated consequences of structural adjustment policies. Research underscored that macro policies might not reach their goals if gender effects were ignored (Elson 1995). This spawned a body of scholarship undertaken by the International Working Group on Gender and Macroeconomics aimed at "engendering" macroeconomic and trade theory, resulting in special issues of *World Development* in 1995 and 2000. This growing body of work has elucidated the critical role of the gender division of unpaid and paid labor for understanding how the macroeconomy functions. The result has been the emergence of a new subfield of gender and macroeconomics, which

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identifies the two-way causality between gender relations (and disparities) and macroeconomic outcomes. This survey paper reviews the main threads of that literature on gender and macroeconomics.

First, I look at the research linking the gender relations that are embedded in institutions at every level of the economy (for example, the household, labor, and credit markets) to economic development and growth. I then examine the reverse causality – the impact of macro-level policies on men and women as a form of intra-group inequality. This review is not exhaustive, given the size of this body of research. Rather, I focus on key research publications that have shaped the way we understand the two-way causality between gender and the macroeconomy.

As reviewed in this paper, theoretical and empirical research finds that the degree of gender equality in education, health, unpaid labor, employment, and wages has substantial economy-wide effects. Theoretical perspectives influence the way 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.

Regarding supply-side macroeconomic effects, gender gaps in education and health are largely transmitted via their dampening effect on labor productivity. Growth can also be hampered by gender employment gaps due to the effect on misallocation of talent and thus productivity. Indirect effects on the macroeconomy are transmitted via the impacts on women's fertility, as well as on children's well-being, and thus long-run labor productivity. On the demand side, gender inequalities in education, wages, and employment affect consumption, saving, investment, exports, and the balance of payments, with the net effect on growth influenced by the structure of the economy, as well as a country's gender division of labor. Moreover, macroeconomically relevant measures of gender inequality differ according to a country's structure of production and stage of development.

Macro-level policies, in turn, may have different effects on women and men. In this paper, I focus on new areas of research that have extended and expanded lessons learned from the earlier gender analysis of structural adjustment. These new areas include the effects of physical and social infrastructure spending, monetary and exchange rate policy, and a variety of demand-management tools, such as Employer of Last Resort (ELR) policies. The research reviewed here 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, the lesson that emerges is that policy goals can be thwarted if gender effects are not taken into consideration.

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. With the assumption of full employment and perfect competition in product and labor markets, the focus is 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:

$$Y = Af(K, H, L) \tag{1}$$

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 – in particular, education and labor force participation rates (Klasen and Lamanna 2009; Bandara 2015). While the models do not explore how gender affects technological progress (A) or the growth of the capital stock (K), they do incorporate the gender dimensions of care and reproductive labor and the implications for children and long-run labor productivity growth.

A second methodology is overlapping generation (OLG) models, 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 (and in this way, capture growth effects). Models are engendered by incorporating women's time allocation between productive and reproductive work (Agénor and Canuto 2012; Khera 2016; Kim, Lee, and Shin 2016). Some 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 policies.

The insights of a number of neoclassical growth and OLG models are circumscribed in their application to the policy realm as they ignore real-world macroeconomic problems, such as aggregate demand deficiencies and balance of payments constraints, which produce feedback effects and 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 (Braunstein 2000; Blecker and Seguino 2002; Seguino 2010; Braunstein, van Staveren, and Tavani 2011;

Braunstein, Bouhia, and Seguino 2017). A distinct feature of the latter models is their allowance for excess capacity and thus unemployment. These models also account for imperfectly competitive product and labor markets and differentiated saving rates by gender. Short-run models engender the macroeconomic equilibrium condition in an open economy:

$$S + T + M = I + G + X \tag{2}$$

where S is saving, T is taxes, M is imports, I is business spending, G is government spending, and X is exports. By engender, I mean that these macroeconomic aggregates are modeled in a way that captures the impact of a change in relative women's/men's well-being (such as wages or access to credit).

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. 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.[1] There are similar 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, in particular, gender gaps in wages and employment. The models differentiate economies by their economic structure and corresponding gender division of labor. They are thus structuralist macro models that 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 (Seguino 2010).[2] Thus, this type of model takes into account both supply- and demand-side factors affecting growth. They differ from neoclassical models by incorporating various forms of gender inequality, including fast-moving variables such as wages as compared to slower-acting variables like gender educational gaps. In the discussion that follows, I identify 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.

Neoclassical Solow growth and OLG models

Education

A large theoretical and empirical literature explores the various channels by which gender equality in education is hypothesized to stimulate growth. Much of this literature derives from the view that due to selection bias, gender gaps in education depress economy-wide productivity (Hill and King 1995; Klasen and Lamanna 2009; Baliamoune-Lutz and McGillivray 2015). The models assume competitive labor markets, such that greater educational equality will be followed by a narrowing of gender wage gaps.

Greater educational equality is also hypothesized to affect growth by reducing fertility rates, as the opportunity cost of children rises with greater education for women (Galor and Weil 1996; Lagerlöf 1999; Kim, Lee, and Shin 2016). Lower fertility rates improve the quality of labor, it is hypothesized, 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 age 25 and older – a stock variable that captures the accumulated historical gender bias in access to education. Baliamoune-Lutz and McGillivray (2015), in contrast, adopt primary and secondary enrollment rates, which are flow variables – that is, they reflect gender gaps in enrollment for a given age group and year. Despite using different measures of education and controls that cover different time periods and countries, the studies reach the same conclusion: gender equality in education is a stimulus to growth over the long run. The effects on growth can be large indeed – up to 1 percentage point in annual per capita gross domestic product (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, the coefficients could be capturing the effect of omitted gender variables, such that empirical estimates of educational effects on growth are overstated. This is likely, given research that shows other measures of gender equality also impact growth. Second, an issue that is as yet unexplored is the implication of gender reversals in education. In some Latin American and Caribbean countries, women's educational attainment exceeds men's (Duryea et al. 2007). Research has yet to explore the growth implications of men falling behind women in formal education.

In addition, despite the narrowing of the gender educational gap, the female/male employment-to-population rate ratios rose only modestly from 1991 to 2010 (Seguino 2016). Figure 1 shows the distribution of countries by female/male employment rates as compared

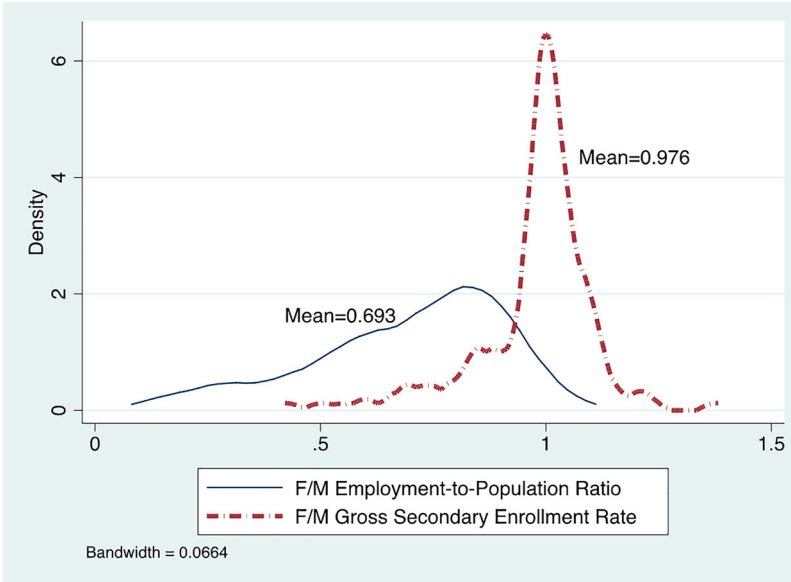

Figure 1 Distribution of countries by female/male gross secondary enrollment and employment rates, 2010.
Source: Seguino (2016).

to gross secondary school enrollment rates in 2010. This suggests that closing educational gaps is not sufficient to ensure women's economic empowerment via employment. Other impediments must be addressed as well, including women's unpaid labor burden and insufficient aggregate demand.

Employment, job segregation, and wages

A number of studies have explored the macro effects of gender differences in access to paid work and job quality. 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. Alternatively, gaps may be the result of external constraints such as employer discrimination and insufficient aggregate demand and thus job vacancies.

Empirical studies primarily employ 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 paid work,

remuneration rates, or employment-related benefits. Nor do they indicate 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 sectors (Heintz 2006). The latter in many countries reflects residual unemployment rather than employment, and thus, employment rates are overestimated, especially in developing countries. The employment data used in the studies discussed here are only a rough approximation of 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 what the employment status of the person is – unemployed or employed. This rough indicator of gender equality should be viewed with some caution.

With that caveat in mind, several authors using panel data for developing countries have found that gender differences in access to paid 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. While the gender gap in labor force participation can reduce economic growth, the combined effect of gender gaps in labor force participation and education appears to 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 (SSA) with annual economic losses estimated to be 5 percent of GDP.

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: to what extent is women's greater relative productivity reflected in higher wages? It is possible that women who tend to be segregated in more labor-intensive industries in some countries (semi-industrialized economies [SIEs] with labor-intensive export sectors) or in part-time, seasonal work are unable to obtain wages commensurate with their skills. If so, the stimulus to growth from higher relative women's employment 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 OLG approach, where women's time allocation between home production, childrearing, and market work is influenced by access to infrastructure (Agénor, Canuto, and da Silva 2010; Agénor and Canuto 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. In the models, children's human capital accumulation depends on mothers'

human capital, while their health status depends on mother's health and her time allocated to care. Women's bargaining power relative to adult men 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' childrearing. 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 would be required to clarify this relationship. Several studies find evidence of gender differences in the marginal propensity to save, albeit with divergent results. On the one hand, in SIEs where young women are the primary source of labor in export factories, higher relative women's wages increase aggregate saving (Seguino and Floro 2003). On the other hand, evidence for Kenya shows that female-headed households have the highest spending, with expenditures concentrated on food (Kiringai 2004). Such contradictory results make it difficult to generalize about gender differences in saving rates. 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 savings on growth is also a questionable one as it ignores the possibility of hoarding – that savings may fail to be channeled into investment and capital accumulation. It also ignores the type of investment. For example, speculative financial investments may not have positive growth effects, as the Great Recession in Europe and the United States and Asian financial crises have shown. The more general point is that many neoclassical models fail to account for country-specific macroeconomic conditions and structures, thereby limiting the applicability of results.

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

Policies such as those to reduce gender discrimination in formal employment are found to increase women's 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.[3] This outcome emerges due to the fact that the model is able to capture short-run effects of policy (unlike 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 quibble with the mechanism by which increased labor demand is induced in Khera's (2016) model. Labor market deregulation is not always associated with greater labor demand;[4] a more important determinant of firms' willingness to hire is aggregate demand (Piasna and Myant 2017). Labor market deregulation that lowers wages may dampen spending, resulting in slower employment growth.

Another related set of OLG models explores the growth effects of various labor market distortions or rigidities and in particular job segregation, with a key assumption that men and women have the same talent distribution (Esteve-Volart 2004; Cuberes and Teignier 2016). Esteve-Volart (2004), in addition, models feedback loops whereby women's limited access to jobs contributes to lower investment in women's education.

Incorporating the role of macroeconomic context

One weakness of these models is the limited focus on occupational segregation as a micro-level phenomenon, thereby missing the important role of macro-level factors and structural change. It is notable that gender job segregation is persistent in countries around the world (International Monetary Fund [IMF] 2013). Recent evidence is suggestive of increased, not decreased, job segregation with a rising share of women excluded from industrial sector jobs that typically offer higher wages and more opportunity for training and job-related benefits than agricultural work and service sector jobs (Seguino 2016). The falling ratio of female to male shares is taking place in a number of countries where manufacturing employment had become "feminized" in the 1980s and 1990s – Mauritius, Hong Kong, Morocco, and the Dominican Republic, for example. 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.

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 about 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, due to a decline in the relative price of manufactured goods on world markets despite productivity growth, leading to deindustrialization and 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 some additional exploration since it is macro-level dynamics that structure opportunities for women to gain access to not only *a* job, but also a *good* job. 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 as a result of trade and investment liberalization.

In sum, two themes emerge from a review of this literature: there is no one-size-fits-all impact of gender equality (however measured) on growth, and research must take into account a country's structure of production, which influences the degree of gender job segregation and gender income gaps. In addition, there are several weaknesses in the studies discussed here. First, most models fail to account for the fact that adequate aggregate demand is required to ensure that increases in female labor force participation are matched by sufficient labor demand. Second, increased employment may not reflect an improvement in well-being if women continue to carry the full load of unpaid labor and if the conditions of employment and remuneration are poor. And finally, the finding that an increase in relative women's 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).

Gender and growth in feminist heterodox macro models

The architecture of feminist macroeconomics is suited to the focus on demand-side factors influencing gendered employment and wages. This framework is in the tradition of 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 mechanism for engendering macro 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, which reflect the stylized structural features of economies (Taylor 2004). The resulting models account for the key features of economies: economic structure (agricultural, semi-industrialized, postindustrial), macro-level policies that influence relations with the rest of the world (rules governing trade and cross-border investment and finance), market structure (oligopolistic versus competitive firms), trade and resulting price elasticities, balance of payments constraints, key social relationships (such as intergroup inequality along racial/ethnic lines), and the form and extent of gendered job segregation. The effects of gender relations in these models also depend on whether we 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).

Gender job segregation, wage inequality, and economic structure

Several papers emphasize the interaction of gender job segregation, gender wage inequality, and the structure of production (Braunstein 2000; Seguino 2000a, 2000b; Blecker and Seguino 2002; Seguino 2010). Blecker and Seguino (2002) develop a model of a two-sector economy, representing conditions in many SIEs where women, to the extent that 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 markup 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 wages for women "squeeze" profits, while, in contrast, "men's" goods are price inelastic, and wage hikes for men do not negatively affect profits and thus investment or employment.

The model shows that under some conditions, higher wages for women contribute to a decline in export demand that is not offset by an increase in domestic demand. As such, gender wage equality in this type of economy is contractionary. That is, it leads to output and employment losses. Both men and women are likely to be negatively affected by these job losses. 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 wage for women. Ultimately, the results depend on the model's parameters, which can be calibrated to reflect economic structure and the impact of shifts in the distribution of income between wages and profits, as well as between female and male workers.

In a previous study, I extended the two-sector model approach to consider the role of gender inequality in low-income agricultural economies (LIAEs) as compared to SIEs (Seguino 2010). I incorporated both fast-acting gender variables in the short-run model (wages and employment) as well as capabilities measures that have effects only in the longer run. 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 differs significantly from SIEs, since 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).[5] Because of this difference in structure, and the role of women in influencing the balance of payments, in the short and long run, gender equality stimulates growth in LIAEs. In the long-run models, gender equality is a stimulus to growth in both types of economies, which is consistent with the findings of the 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 brought to bear to relax those constraints. One weakness of these models 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 in particular are tapped to perform caring labor.

Gender, social reproduction, and growth

A new vein of research has emerged, however, to explore the role of social reproduction in influencing growth (Braunstein, van Staveren, and Tavani 2011; Braunstein 2015; Braunstein, Bouhia, and Seguino 2017). 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 wages for women 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 (1) women and men share social reproduction more 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.

Empirical heterodox studies

Several papers empirically test the theoretical models discussed in the following. In a previous study, I evaluated the hypothesis that education-adjusted gender wage inequality had a positive effect on growth in a set of SIEs for the period 1975–95 via the stimulus to export demand (Seguino 2000b). The sample was restricted to SIEs so as to isolate the role of wages in these economies where the type of gender job segregation and economic structure differs from low- and high-income countries. GDP growth is positively related to gender wage inequality, controlling for standard variables deemed to influence growth. Congruently, Berik, van der Meulen Rodgers, and Zveglich (2004) and Busse and Spielmann (2006) found 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 women's low wages on export demand (produced predominantly by female labor) and growth should not be surprising. We might construe these low wages as substituting for currency devaluation, a policy stance that is more widely understood to have a positive effect on export demand.[6] More specifically, in an economy in which women are concentrated in the labor-intensive export sector, export demand is:

$$X = A\left[\frac{eP_x^*}{P_x}\right]^{\psi} W^{\varepsilon} \tag{3}$$

where X is export demand, A is a constant, e is the nominal exchange rate, P_x^* is the foreign currency price of competing export products from other countries, ψ is the price elasticity of demand for exports, P_x is the export price, 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:

$$P_x = \tau\,[w_F b] \tag{4}$$

where P_X is the domestic price of exports, τ is the markup over unit costs in the export sector, and b is the labor coefficient. It is clear from Equations 3 and 4 that higher women's wages negatively affect export demand.

Women supply labor in export sectors in SIEs, which accounts for the positive effect of gender wage inequality on growth. This result is entirely consistent with a positive effect of educational equality on growth, since 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 women's wages should be suppressed as a way 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 women's wages compatible with growth.

Mitra-Kahn and Mitra-Kahn (2009) add a new twist to the gender wage inequality-export-growth nexus. They find that the relationship between the gender wage gap and growth is nonlinear, and in particular, as countries move up the industrial ladder, the gender wage gap no longer has a significant effect on growth. This finding could result from (a) gender employment discrimination in capital- and skill-intensive industries or (b) simply the lesser importance of the labor-intensive manufacturing sector in stimulating growth as a result of the process of technological and structural change.

Schober and Winter-Ebmer (2011) replicate Seguino (2000b), using data from a meta-study on gender wage discrimination, and 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 sector, as in Seguino (2000b). In addition, the analysis does not control for countries' economic structure, which, at a minimum, should be interacted with the wage gap variable.

Some have argued that in the longer run, increased demand for female labor in SIEs will eventually lead gender wage gaps to close. If relative women's wages were to rise, however, this would dampen export demand and investment, resulting in higher unemployment and thus wage stagnation. This feedback effect is the central problem to be overcome. Globalization makes this problem worse 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). Despite

substantial gains in education in South Korea, for example, women's wages continue to be more than 35 percent below that of men's (Organisation for Economic Co-Operation and Development [OECD] n.d.), a gap that has narrowed only modestly over the last fifty years despite a strong demand for female labor. This is also the case in Brazil and other SIEs.

In sum, unlike the neoclassical gender and macro literature that find that all forms of gender equality stimulate growth, heterodox macro research portrays a more complex picture. These models allow a more specific rendering of real world macroeconomies in contrast to neoclassical models, which assume a homogenous structure and gender division of labor. Heterodox and neoclassical macro models do agree on one thing, however: 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 have feedback effects on the macroeconomy. If we ignore those feedback loops, macro policy could fail to achieve its goals.

MACRO-POLICY EFFECTS ON GENDER EQUALITY

The most informative studies have explored the impact of globalization policies (trade, investment, and financial liberalization) and, more recently, the effects of fiscal and monetary policy.[7]

Globalization policies

A variety of macro-level policies can contribute to growth and their effects may conflict. A 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. Below, I identify the key pathways by which these three policy indicators produce gender-differentiated effects.

Trade and investment liberalization

Several studies have explored the employment and wage effects of trade and investment liberalization, the latter measured as FDI. Here I simply identify some of the major results of this literature, which more than in 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. That is, its purpose is to shift production to lower-cost production venues with the intent to export to foreign markets.

Standing (1989) was among the first to note the link between trade liberalization and the feminization of global labor, referencing the increased demand for female workers and the downward harmonization of the quality of men's jobs to those women held. He identified intensified firm competition in an increasingly globalized economy as a cause for these trends, emphasizing the firm's search for least-cost female labor as a means 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-Téllez 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. International data on employment fail to capture the full extent of informal employment (Heintz 2006). 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). 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).

Wamboye and Seguino (2015) show that the impact of trade and investment liberalization on employment depends on the structure of the economy. They empirically explore the gender employment effects of trade liberalization in SSA, dividing their sample into three types of economies: (a) nonmineral non-oil exporters (NMECs), (b) non-oil mineral exporters (MECs), and (c) oil exporting economies. Results indicate that trade expansion has a negative effect on women's absolute and relative employment chances in NMECs but not MECs. Consistent with these results, Bussolo and De Hoyos (2009) found that labor-intensive manufacturing jobs were lost in a number of African economies as a result of trade liberalization due to competition from Asia, with negative effects on women's employment. Further, in agriculture-based African economies, men are better positioned to produce export cash crops due to underlying asset ownership patterns, resource inequalities, and gender roles. 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, such as Asia (Aguayo-Téllez 2011).

With regard to 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 women's 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; Berik, van der Meulen Rodgers, and Zveglich 2004; Liu 2004). Menon and van der Meulen 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,[8] gender wage gaps have widened in the context of a declining capital intensity of production and increased share of FDI in investment (Artecona and Cunningham 2002; Domínguez-Villalobos and Brown-Grossman 2010).

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 workers' bargaining power 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.

Baliamoune-Lutz (2007) explored the triangular relationship between trade, growth, and gender differences in youth and adult literacy rates. SSA trade effects are compared to those in other regions with a panel dataset using 3SLS techniques. Her empirical evidence showed 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. That is, integration with the global economy has caused gender inequality in literacy rates to increase in that region.

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 (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 men's jobs in the sector (Staritz and Reis 2013).

The most important lesson to be drawn from this literature 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 there is no one-size-fits-all trade or investment policy that would promote gender equality, countries must carefully identify how their own economic structures will be affected by policies to liberalize or regulate trade and investment and trace out the likely gendered impacts based on the gendered job segregation that exists.

Financial liberalization

Financial liberalization policies have been widely adopted over the last two decades and have led to the opening up of capital markets to external flows and, concomitantly, pressures to keep inflation rates low as a means for countries to attract those flows. A good deal of research links the growth of household income inequality to financial liberalization (Gonzales et al. 2015).

Scholars have also underscored that financial liberalization brings with it a number of problems that worsen gender equality (see Elson and Cagatay [2000]; Braunstein [2012]). First, macroeconomic volatility may increase with liberalization of capital flows, and women are particularly vulnerable during such times because (a) they tend to have control over fewer assets and saving to smooth income, (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 contributes to a deflationary bias. Because wealth holders' real rates of return are negatively affected by inflation, 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.

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 currency attack. According to Rodrik (2006), the opportunity cost of those reserves is roughly 1 percent of GDP. Any analysis of the costs and benefits of capital account liberalization would then have to factor in the trade-off of holding reserves as compared to their alternative use, such as for

public investment. An additional cost of capital account liberalization is the impact of increased macroeconomic volatility and risk of crisis on households. Countries must 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 income-smoothing social safety net programs if financial liberalization were deemed the appropriate policy stance. 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.

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 services. 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 product prices induced by devaluations. The lengthening and intensification of women's labor time in such cases may have negative effects on children's well-being, imposing long-run economic costs. Unfortunately, the paucity of time-use data makes it difficult to empirically assess the impact of various macroeconomic disturbances and public sector budget cuts on gender inequality in time use.

Two studies assess the gendered impact of the Great Recession on time use in the US and Turkey, respectively. Berik and Kongar (2013) find that during the US recession, married mothers increased their paid hours mainly by spending less time on household tasks – 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.

In Turkey, increases in men's unemployment risk have been found to directly affect their female spouses, who must then spend more time in both paid and unpaid work (Kaya Bahçe and Memiş 2013). 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 take into account 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 related to economic openness widen the degree of gender inequality, long-run growth may be hampered even if, in the short run, there are expansionary demand-side effects of inequality.

Fiscal policy

Fiscal policy – that is, government spending and taxation – had until two decades ago been seen as gender neutral in its effects. That changed with the research on the impact of structural adjustment in developing countries. More recently, the economic crisis and responses to it have led to an exploration of this issue in developed economies. For expositional purposes, I discuss the relevant research by delineating several distinct categories of government expenditures: public investment in physical and social infrastructure, ELR programs, and countercyclical and full-employment policies (and their converse, fiscal consolidation or austerity).

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 (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. Second, 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.

The distributional effects of public investment in physical infrastructure have received attention in recent years, with research identifying a strong

link between measures of physical infrastructure spending, 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). 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. According to their simulations, the time released from unpaid work would raise women's income by 17.7 percent relative to the economy-wide average, and men's by 1.6 percent annually.

Using Brazilian data to simulate the effect on growth of changes in government spending on infrastructure as a share of GDP, Agénor and Canuto (2015) find that a 1 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 variables such as growth, the trade balance, and inflation. That said, they 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 – the types of infrastructure spending and the impact on men's and women's time use.

The evidence does not suggest, however, that gender gaps in employment will automatically close as a result of jobs created by physical infrastructure investment. Chakraborty (2010) found that in India, infrastructure investment lessened unpaid care work, but women's employment did not increase. She concludes that complementary employment policies (of the demand-management type) are also required to ensure the substitution of market work for unpaid work.

The effects of public infrastructure investment on women's employment vary, and there is as yet no consensus on whether the effect is significantly positive. There is greater agreement, 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, girls' school attendance (Koolwal and van de Walle 2010; Nauges and Strand 2013). This growing body of research is useful for identifying the kinds of public sector expenditures that would be beneficial for gender equality in time use and employment, as well as health.

Public investment in social infrastructure

Social expenditures, because they contribute to gender equality and long-run productivity growth, 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.

Social infrastructure spending can relieve women's unpaid care burden through publicly funded social services, freeing up time for paid employment. Further, due to gendered patterns of employment, such investment creates job opportunities that differentially benefit women workers. 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 et al. (2010) find that, for the US, investment in social service delivery sectors, such as early childhood development and home-based healthcare, could create twice as many jobs as the same level of expenditures on physical infrastructure, which creates jobs in construction and energy. Women are more likely to get these jobs, and among 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.

De Henau and Himmelweit (2016) develop a macro–micro input–output model to estimate the impact of public investment in care for a set of advanced economies. The potential effects of such investment are short term (women's unpaid work falls, more jobs are created that women are able to 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). In their model, two-thirds of newly created jobs go to women in the care sector compared to one-third in the construction sector.

These studies show that a demand-side stimulus can increase job opportunities for women and men and, when appropriately targeted,

produce a differential demand for women's labor. It serves the additional purpose of absorbing the increased women's labor supply that results from publicly funding care services. This is especially important since efforts to open up 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 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).

Is social infrastructure spending 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 create fiscal space by raising the productive capacity of the economy (Roy, Heuty, and Letouzé 2009). Much of the spending on the care sector raises longer-run productivity by improving the quality of the current and future labor force. Heckman and Masterov (2007) identify substantial paybacks from early childhood education, for example. By raising labor productivity, such expenditures increase incomes, generating tax revenues with which to pay down the debt incurred to finance the original investment.

Under current rules advanced by institutions such as the IMF, the degree of fiscal space is circumscribed by limits placed on a country's public debt relative to GDP. This approach to establishing debt ceilings defines fiscal sustainability for the short term and ignores the effect of targeted public spending on growth over the longer term. As a result, the fiscal sustainability of this type of public investment is underestimated. Relatedly, current guidelines for assessing fiscal space and sustainability ignore *what* the fiscal space is used for. The result is restrictive fiscal targets, and this has led to a decline in public investment/GDP ratios in many countries.

To effectively make the rigorous case for the ability of social infrastructure expenditures that promote gender equality to expand medium- and long-run fiscal space, more focused empirical research is required. Targeted studies that estimate the payback of gender equality investments are pivotal to expanding the discourse and consensus on fiscal space.

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 (as a result of crisis among

trading partners), women's job losses are likely to exceed men's. This occurred during the Asian financial crisis and in developing countries during the Great Recession of 2008. In contrast, during the most recent global recession, which began in industrialized countries in the housing sector, job losses first hit the construction and then manufacturing industries. Because they are male-dominated in employment, men's job losses exceeded women's at the beginning of the recession (Pearson and Sweetman 2011).

Employment effects by gender 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.

ELR programs are one example of such policies, cushioning the effects of downturns and reducing gender conflict over scarce jobs. ELR programs 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 100 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. In 2009–10 women comprised about 48 percent of those employed by this job guarantee scheme (Dutta et al. 2012; Das et al. 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 2017). Pollin et al. (2007), 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) and asset reserve

requirements to stimulate the extension of credit to firms with large employment multipliers, along with public investment in infrastructure.

Monetary policy

Regardless of the factors that influence monetary policy (such as financial liberalization), it is likely to have 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 2008; Takhtamanova 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 Pépin 2016; Masciandaro, Profeta, and Romelli 2016).

Braunstein and Heintz (2008), pioneers in this research, 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 the developing countries examined. For the US, Seguino and Heintz (2012) find evidence of a disproportionate increase in women's relative unemployment in response to contractionary monetary policy. In contrast, Takhtamanova and Sierminska (2009) do not find a link between short-term interest rates and employment in nine OECD countries (nor do they find significant gender effects).

In terms of the conduct of monetary policy, Diouf and Pépin (2016) and Masciandaro, Profeta, and Romelli (2016) provide evidence that gender diversity in central bank boards and chairs affects the conduct of monetary policy and hence macroeconomic outcomes. Greater relative women's representation on central bank boards is inversely associated with inflation rates and money growth. Diouf and Pépin (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 inform about 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 unemployment and (b) the relationship between monetary policy in terms of short-term interest rates and other policy tools, such as asset-based reserved requirements designed to target credit to key sectors or groups (Epstein 2007).

More generally, a research agenda that assesses the relationship between inflation targeting and gendered well-being is a major gap in our understanding of the relationship between macro policy and gender. The importance of this area of research is that monetary policy is one of

the feedback loops that explains gender equality, which then influences growth. In the absence of gender-aware monetary policies, governments could unintentionally undermine their 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 men's unemployment lead to greater domestic violence (Macmillan and Kruttschnitt 2004; Aizer 2010), the macroeconomic costs of which have been estimated to be very high (Duvvury et al. 2013). The effect of unemployment on domestic violence and household dissolution is not yet settled. In a study on the United Kingdom, Anderberg et al. (2013) find that an increase in men's unemployment decreases the incidence of intimate partner violence, while higher women's unemployment increases the risk of domestic abuse.

There is as yet little research on gender and exchange rate policy. One recent study, however, looks at the effect of depreciations and appreciations of the Uruguayan real exchange rate on gender wage gaps with impacts on domestic violence rates (Munyo and Rossi 2015). In their empirical model, men are concentrated in tradable industries, such as manufacturing, while women are more likely to work in nontradable industries, such as the service sector. Taking account of household bargaining dynamics, they argue that an increase in the real exchange rate can improve men's household bargaining power relative to women, with evidence that this raises the frequency of domestic violence.

Few macroeconomists take into account the less visible costs associated with employment loss, wages gaps, and domestic violence. This area therefore deserves more attention and inclusion in macro models that evaluate the relationship between gender, family dynamics, and growth.

CONCLUSION

Synopsis of findings

Research demonstrating the effect of gender on the macroeconomy has invigorated the study of macroeconomics and inequality. Gender inequality's effects on the macroeconomy differ in some key ways from other forms of inequality. A key transmission mechanism is through the impact on children's well-being and long-run productivity growth. Moreover, gender norms and stereotypes that buttress the gender division of labor with women segregated in low-wage and unpaid work produce notable supply- and demand-side effects on the macroeconomy. The challenge going forward is for economists to integrate the robust findings of this literature into macro models and empirical research.

Further, in terms of the reverse causality from the macro economy to gender relations, the evidence shows that a variety of macro-level policies contribute to (or undermine) gender equality. This research demonstrates that inequality is not simply a micro-level problem and that the macroeconomy operates as a structure of constraint on closing gender gaps in well-being. Gender-aware policies can play an ameliorative role. 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 employment. Social spending on health and education can both reduce gender gaps in these areas *and* stimulate demand for women's 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 ELR programs. Research shows that monetary policy – including both interest rate and exchange rate policy – also affects gender employment equality. Given that macro-level policies can narrow and close gender gaps, and that gender equality under some conditions is a stimulus to growth, effective policymaking requires that gender dynamics be given a key role in policy formulation.

Areas for future research

While progress has been made in understanding the relationship between gender and the macroeconomy, several areas require further investigation.[9] Many studies explore gender inequality in employment, but employment data do not identify 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 women's 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 – additional research 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 toward a woman's right to a job when jobs are scarce)? These questions require answers to better target and design macro-level policies.

Perhaps one of the largest policy research gaps is in the conduct of traditional macro policy – in particular, 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.

And finally, an area not mentioned in this review due to lack of research on the topic is gender and ecological macroeconomics. Ecological macroeconomics is an emerging interdisciplinary field that examines the macroeconomy as part of the ecosystem, accounting for the finite limits of the planet. Fontana and Sawyer (2016) have authored one of the few papers on this topic from a Kaleckian/post-Keynesian framework, noted for its ability to explore distributional dynamics. Although their model does not address gender, it provides a starting-point for much-needed research that integrates gender, distribution, the environment, and macroeconomics.

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SUPPLEMENTAL DATA

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NOTES

[1] In the literature, investment is positively related to both profits and sales (demand). Theoretically, wider gender wage gaps may reduce aggregate demand and thus sales, thereby dampening investment through the accelerator effect. The net effect of gender gaps is therefore ambiguous. Though there is little evidence in the literature that the accelerator effect dominates the profitability effect in terms of gender, the reader should have in mind that both effects are possible, with the net effect an empirical question.

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

[3] Policies include increased investment in women's education and stronger enforcement of laws against gender discrimination, thereby raising demand for women's labor. On the supply side, improvements in safety for women and mobility raise women's labor supply.

[4] Kotwal, Ramaswami, and Wadhwa (2011), also find evidence that labor market deregulation stimulated job growth in India in the post-reform period.

[5] Numerous authors have identified the positive effect of gender equality on agricultural production. See, for example, Doss and Morris (2001) and World Bank (2011). Darity's (1995) noteworthy contribution is a micro-level model for LIAEs with gender segregation, whereby men seek to maximize their income from export cash crop production by drawing women out of household/social maintenance activities including subsistence agriculture production.

[6] Currency devaluation does not always produce a positive demand-side stimulus, especially in developing countries with rigid imports. The effect may in fact be contractionary (Krugman and Taylor 1978). A fall in women's wages might also be contractionary, but for different reasons – lower women's wages may reduce aggregate consumption. However, in export-led economies, that decline is unlikely to outweigh the positive effects on investment and exports.

[7] Earlier work econometrically explored whether economic growth itself was found to improve gender equality. That research yielded ambiguous results, and it became clear that growth itself is too broad a category, necessitating a focus on specific policies (Duflo 2012).

[8] Aguayo-Téllez, Airola, and Juhn (2010) find evidence that trade liberalization (specifically, the NAFTA agreement) increased the demand for women's labor in the labor-intensive manufacturing sector in Mexico and reduced gender wage inequality.

[9] The Supplemental Online Appendix discusses in greater detail avenues for future research, focusing on areas where adding a gender dimension would sharpen macro models and increase the relevance of their results.

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