Macrodynamics of Gender Wage Share Differentials: A Kaleckian Exploration

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Abstract

Gender wage gaps have been studied as an important signifier of gender inequality. Empirical approaches usually decompose the gender wage gap into an explained and an unexplained discriminatory component. The latter has been attributed to social factors that reproduce gender inequality which manifests itself as conventional definitions of gender roles, gender discrimination, gender differences in attitudes toward various activities in the domains of social production and social reproduction. The empirical route has been the more widespread entry point to the modelling of gender wage gaps. But all empirical endeavours have derived from and contributed to the setting up of theoretical approaches which have tended to employ neoclassical as well as post Keynesian/Kaleckian frameworks to try and comprehend the macroeconomics of gender wage gaps. Neoclassical economic models tend to focus primarily on the supply side including the effects of intra-household bargaining on issues such as fertility, savings, and gender skill variation. Gender issues in Kaleckian macroeconomic models, on the other hand, have involved an examination of the two-way relations between gender wage gaps and aggregate demand which inter alia involve other macroeconomic variables such as income distribution. Most previous work in both macroeconomic traditions has tended to consider the gender wage gap as being exogenously determined.

This paper sets out a Kaleckian macrodynamic model with conflict inflation and an endogenous gender wage share differential. It then seeks to examine how the gender wage share differential along with the share of profits, degree of capacity utilisation and the rate of growth move along a cyclical trajectory. An empirical examination of the cyclical trajectory of the gender wage share differential is then attempted through a two-stage estimation process involving Blinder-Oaxaca decomposition of the gender wage share differential in the first stage into explained and unexplained components. The second stage regresses the residual unexplained or discrimination component on capacity utilization rates. We look at a set of seven developed countries – US, UK, Germany, Canada, France, Japan and South Korea. We obtain a positive and significant coefficient for capacity utilization rate for all countries of study in the developed country group, except Germany. This broadly validates the basis of the theoretical model. The empirical analysis seems to indicate that the gender wage share differential is mostly pro-cyclical for the countries in question. The paper concludes with the identification of some further theoretical and empirical questions in this research direction including the role of various types of government policy in reproducing gender wage share differentials.

Key words: gender wage share differentials, income distribution, cycles, Kaleckian model
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1. Introduction

Gender wage gaps have been examined from a number of alternative perspectives as a significant signifier of the broader phenomenon of gender inequality[3]. There is an extensive literature, both empirical and theoretical, examining issues related to the gender wage gap (Kongar and Berik, 2021).

Goldin (2014), arguing from a broadly neoclassical position, describes the wage as "a summary statistic for an individual's education, training, prior labour force experience, and expected future participation, and the gender gap in wages a summary statistic for gender differences in work".

Gender gap in wages has correspondingly been viewed as summarizing human capital[4] differences between men's and women's productivity, as well as differential treatment of men and women in the labour market. Most studies decompose the gender wage gap into an "explained" component, attributable to differences in productive characteristics, and the remaining residual component, termed "wage discrimination".

The persistent remainder, the unexplained pay gap, has then been studied in terms of factors like conventional gender roles, e.g. motherhood penalty for women and a marriage premium for men, gender differences in attitudes toward competition, negotiation, and risk aversion (Blau and Kahn, 2017). These, apart from gender differences in location in the labour market, across occupations and industries, better accessibility of market substitutes for unpaid care work and advances in household equipment (Greenwood *et al*, 2005) and dissemination of birth control pills (Goldin and Katz, 2002; Bailey 2006; Bailey *et al*, 2012) remain important, and strongly suggests that discrimination cannot be discounted as a contributory factor to gender wage gaps.

Recent work on the "grand gender convergence" (Goldin, 2014) refers to a purportedly noteworthy reversal of the gender gap in human capital capabilities, associated with improvements in women's education and skills (e.g., Blau and Kahn, 2017; Autor *et al*., 2008; Blau, 1998; Blau *et al.*, 2014), experience, and occupational representation, alongside a rise in women's inclusion in unions. These have been important underlying factors, according to some scholars, in narrowing the gender wage gap, apart from significant increases in women's labour-force participation, driven by the "quiet revolution" in gender roles (Goldin, 2006).

Alternatively, Elveren and Goksel (2024) argue from a heterodox macroeconomic stance that: "Feminist macroeconomics is built on one vital acknowledgment: labour is a produced means of production whose reproduction is achieved by both paid and unpaid work, with women disproportionately shouldering the unpaid work. Underscoring that macroeconomic policies may not achieve their goals if gender effects are ignored, some feminist scholars with the International Working Group on Gender and Macroeconomics have engendered

[3] Most studies of gender inequality, informed by neoclassical economics, accord relatively more significance to gender wage inequality when compared to gender asset inequality.
[4] Auerbach and Green (2024) provide a detailed critique of human capital theory.

macroeconomic and trade theory by taking account of the gendered division of labor in both paid and unpaid work".

Thus, not only is gender inequality relevant in the differential treatment of men and women in the labour market, it also underlies the purported differences in the manifested levels of labour productivity of various genders. For instance, in low- and middle-income families in developing countries the relatively limited magnitude of family income (especially when the proliferation of the neo-liberal project has undermined public education), there is a tendency to disproportionately allocate these funds to education of male students who it is believed will provide a modicum of old age social security out of their future income (Saha, 2013).

Besides, if higher education is principally financed by student loans from banks (who also attempt to enhance profits persistently), then the magnitude of the student loan disbursement would depend on the bank's expectations about the future earnings of the borrower. If banks considered the gender wage differential into account and the gender skew in paid work then banks will tend to put in place a gender skew in student loan disbursement[5]. Thus, gender inequality deriving from unequal access to education is reinforced by the working of the banking system under capitalist conditions.

It is also in the interest of capitalists to keep in place and reinforce where relevant to their attempts to enhance profits, gender (and other types of) inequality in the labour process (Saratchand, 2021). This involves phenomena such as a gender wage differential for the same work, gender wise skewed clustering across jobs involving disproportionate share of men in relatively high wage jobs and consequently feminisation of other jobs. The rollback of much of the public support for social reproduction after the emergence of neoliberalism has resulted in women being systemically compelled to seek out paid work at whatever wage possible which has resulted in an exacerbation of the gender wage differential. Moreover, gender (and other types of social) inequality also tends to reduce the collective bargaining power of the working class due to the resultant attenuation in the degree of coordination in such bargaining[6].

Lastly, the unpaid work component of capitalist social reproduction tends to be disproportionately placed on women and this gender segmentation tends to strengthen the relative bargaining power of the capitalist class in the social production process. However, the realisation of this process of gender segmentation tends to be refracted by social norms and traditions of various kinds whose ideological idiom derives partially from pre-capitalist practices which works to obscure its relevance to the reproduction of the capitalist system[7].

While most modelling of gender wage gaps has tended to emphasise empirical inquiries, it cannot be denied that all empirical work derives from and enables the construction of various theoretical approaches. There are various studies employing theoretical approaches involving the macroeconomics of gender wage gap in neoclassical as well as post-Keynesian or

[5] This is an adaptation of Kalecki's principle of increasing risk to bank decisions on student loans (Kalecki, 1937).

[6] Typically, there tends to be a positive relation between the persistence of increasingly coordinated wage bargaining and the rise of class consciousness among different segments of the working class since this coordination requires the political addressing of the causes of this segmentation.

[7] Therefore, the often-expressed hope that the further proliferation of the accumulation and diffusion of capital will lead to the end of gender inequality such as Goldin (2014) is unlikely to fructify.

Kaleckian frameworks. Within both macroeconomic traditions, the gender wage gap is usually considered to be exogenously determined.

Neoclassical macroeconomic models on the effects of gender inequality focus primarily on the supply side including the effects of intra-household bargaining on fertility, savings, and human capital (Agenor and Agenor, 2014; Doepke and Tertilt, 2016; Fukui and Steinsson, 2019). Gender issues in post Keynesian/Kaleckian theoretical models, on the other hand, have tended to examine the impact of gender wage gaps on income distribution, aggregate demand, capital accumulation and productivity growth (see Hein, 2020; Onaran *et al*, 2022; Erturk and Cagaty, 1995).

Ertürk and Çagatay (1995) examine the interaction of savings and investment in the context of a dynamic Keynesian growth cycle model. They analyse the macroeconomic implications of cyclical and secular movements in the feminisation of the labour force and changes in the intensity of female household labour, and assess the likelihood of a structurally adjusting economy experiencing a recovery through feminisation.

Braunstein *et al* (2011) and Seguino (2010, 2012) incorporate both demand and supply-side effects of gender equality in structuralist, post-Keynesian/Kaleckian models. Seguino (2010, 2012) incorporate endogenous technological change including the effects of gender equality, demand, and public spending on productivity in the short-run and long-run in the backdrop of an open and closed economy settings respectively. Seguino (2010) describes the effects of gender equality on the balance of payments. While Seguino (2000) shows that gender wage discrimination in export-oriented semi-industrialized countries tends to fosters investment and growth, Schober and Winter-Ebmer (2011) find that the impact of gender inequality is negative for growth. Seguino and Grown (2006) follow a Kaleckian framework to examine the relationship between the gender distribution of income and macroeconomic outcomes. They review evidence of the gender effects of globalization in developing economies and prescribe policies to promote gender equity.

González *et al*. (2022) invoke gender wage gap through an interaction with gender norms by incorporating substitutability between women's and men's care work in a theoretical framework, along with occupational segregation. Onaran *et al* (2022) develop a three-sector gendered post-Kaleckian model to analyse the effects of fiscal policy and reduced gender gaps on GDP, productivity, and employment of men and women in the short and long run. The model takes into account the role of unpaid domestic work and its effects on labour productivity.

Braunstein (2015) develops a structuralist macroeconomic model where distribution of income determines aggregate demand, investment and growth. The model considers macroeconomic consequences of a decline in gender inequality in the labour market, by analysing how the unequal distribution of social production and social production roles among genders in association with the interventions of the state and capital determine investment and growth, thereby demonstrating how gender inequality is both cause and consequence of these processes.

What we do

Whether studying the gender wage gaps in a neoclassical framework or in a post Keynesian/post Kaleckian framework, most models as previously pointed out take the gender

wage gap as exogenously determined. This paper sets out a Kaleckian macrodynamic model with conflict inflation and an endogenous gender wage share differential. The paper takes the gender wage share differential as a variable as opposed to the gender wage gap because this paper adopts the aforementioned heterodox perspective wherein all aspects of the labour process including wage and employment are gendered both in terms of consequence and constitution.

It then seeks to examine how the gender wage share differential might move along with the share of profits, degree of capacity utilisation and the rate of growth on a cyclical trajectory. An empirical examination of the cyclical trajectory of the gender wage share differential is then attempted through a two-stage estimation process involving Blinder-Oaxaca decomposition of the gender wage share differential in the first stage into explained and unexplained components. The second stage regresses the residual unexplained or discrimination component on capacity utilization rates and the overall unemployment rates. We look at a set of seven developed countries - US, UK, Germany, Canada, France, Japan, and South Korea- in the empirical exercise.

The remainder of the paper is organized as follows. The next section presents the theoretical model. Section 3 gives the empirical estimation framework. Section 4 describes the data used in the empirical estimation and the data sources. Results and discussions are given in Section 5, and Section 6 concludes the paper.

2. A Preliminary Macrodynamic Model

In this section, a preliminary formulation about gender wage share differentials is embedded into a basic Kaleckian macrodynamic model (Kalecki, 2013[1954]). For simplicity of exposition neither government policy nor foreign trade and capital flows are part of the the capitalist economy in question.

Output (Y) equals the sum of wages (W) and profits (R).

$$Y = W + R$$

Output, which is demand determined, equals also the sum of consumption (C) and investment (I):

$$Y = C + I$$

Wages are fully consumed while a fraction s of profits is saved:

$$C = (1 - s)R + W$$

Therefore, process of realisation of profits will determine the magnitude of profits:

$$R = \frac{I}{s}$$

The share of profits (m) is defined as follows:

$$m = \frac{R}{Y}$$

Consequently, the demand determined level of output will equal:

$$Y = \frac{I}{ms}$$

The degree of capacity utilisation is defined as the ratio of output to the capital stock (K)[8]:

$$u = \frac{Y}{K}$$

The ratio of investment to the capital stock is defined as g:

$$g = \frac{I}{K}$$

The degree of capacity utilisation that pertains to the demand determined level of output is as follows:

$$u = \frac{g}{ms}$$

The demand determined rate of profit is determined as follows:

$$\frac{P}{K} = \frac{g}{s}$$

Investment is determined in a two-stage process. The target rate of investment is an increasing function of both the rate of profit and the degree of capacity utilisation. The actual rate of investment gradually adjusts towards the target rate.

$$\frac{dg}{dt} = \eta\left(a\left(\frac{R}{K}\right) + \alpha u - g\right)$$

The wage bill equals the sum of male wages and female wages:

$$W = (w_F l_F + w_M l_M)Y$$

Here w_F is the female wage rate, l_F is the female labour required per unit of output, w_M is the male wage rate and l_M is the male labour required per unit of output.

Now the female wage share is a fraction of the male wage share:

$$\frac{w_F l_F}{p} = (1 - j)\frac{w_M l_M}{p}$$

Here $j < 1$ and p is the price level.

Consequently, the relation between the male wage share and the profit share may be expressed as follows:

$$1 - m = \frac{w_M l_M (2 - j)}{p}$$

Logarithmic differentiation of this expression yields:

$$\frac{dm}{dt} = (1 - m)\left(\frac{1}{p}\frac{dp}{dt} - \frac{1}{w_m}\frac{dw_m}{dt} + \frac{1}{2 - j}\frac{dj}{dt}\right)$$

[8] It is assumed for the sake of simplicity that the ratio of full capacity output to the capital stock equals unity.

Here it is assumed that the productivity of labour of male workers is unchanged for the sake of simplicity.

Firms set prices to try and achieve a target share of profits. It is assumed for simplicity that the target share of profits is a constant (denoted by ϕ). Whenever, the target share of profits exceeds the actual share of profits, firms increase prices and vice-versa.

$$\frac{1}{p}\frac{dp}{dt} = \theta(\phi - m)$$

Wage bargaining happens in a gender wise semi-coordinated manner. The rate of growth of male wages rises when the target wage share of all workers (Ω) exceeds the actual wage share of all workers ($1 - m$) and vice versa:

$$\frac{1}{w_M}\frac{dw_M}{dt} = \mu\big(\Omega - (1 - m)\big)$$

The target wage share of all workers is firstly an increasing function of the employment rate (that is proxied here by the degree of capacity utilisation u). Secondly, the wage share of all workers is a decreasing function of the gender wage share differential. This is the case since a rising wage share differential will result in a decline of the collective bargaining power of all workers due to the resultant attenuation in the degree of coordination of such bargaining processes:

$$\Omega = (\zeta + \chi u - \omega j)$$

The target level of the wage share differential is an increasing function of the degree of capacity utilisation i.e. the wage share differential is pro-cyclical. The positive relation between the degree of capacity utilisation and the gender wage share differential will emerge on account of the following factors. During the business cycle upswing: One, male workers are disproportionately employed in the capital goods industries whose output (i.e. investment) fluctuates pro-cyclically more than other components of aggregate demand; two, the male wage rate tends to rise faster than the female wage rate if male workers are disproportionately concentrated in sectors where the wage rates are sensitive to the ratio of labour demand to labour supply i.e. where jobs are relatively more formalised and union density is relatively higher; three, since women are disproportionately burdened with unpaid work related to social reproduction under capitalist conditions, their ability to engage in paid work increases when the female wage rate is high enough to cover the cost of (at least partially) paying for the cost of unpaid work related to social reproduction. Thus during a business cycle upswing when both male and female wage rates rise, the ratio of labour demand to labour supply rises relatively more for male workers since the female labour supply rises relatively more than male labour supply (while the ratio of labour demand of male workers to female workers rises due to the two aforementioned reasons) which increases the gender wage differential by dampening partially the increase in the female wage rate. All these three processes work in the opposite direction during the business downswing.

The actual level of the wage share differential adjusts towards the target level at a finite rate:

$$\frac{1}{j}\frac{dj}{dt} = \sigma(\tau + \iota u - j)$$

The resulting three-dimensional continuous dynamical system involving the three variables g, m and j is as follows:

$$\frac{dg}{dt} = \eta\left(\frac{\alpha g}{s} + \frac{\alpha g}{ms} - g\right)$$

$$\frac{dm}{dt} = (1-m)\left(\frac{\sigma\left(\frac{\iota g}{ms} - j + \tau\right)}{2-j} - \mu\left(\frac{\chi g}{ms} + m - \omega j + \zeta - 1\right) + \theta(\phi - m)\right)$$

$$\frac{dj}{dt} = \sigma\left(\frac{\iota g}{ms} - j + \tau\right)$$

This three-dimensional dynamical system has an interior steady state which is determined recursively. The parameters of the investment function determine the steady state level of the share of profits:

$$m^* = \frac{\alpha}{s-a}$$

Thereupon, the steady state levels of g and j are jointly determined by the parameters of laws of motion of the profit share and the wage share differential.

$$g^* = \frac{\alpha s(\mu\zeta s - \phi\theta s - \mu\omega\tau s - \mu s - \mu\zeta a + \phi\theta a + \mu\omega\tau a + \mu a + \alpha\theta + \alpha\mu)}{\mu(\iota\omega - \chi)(s-a)^2}$$

$$j^* = \frac{\iota\mu\zeta s - \phi\iota\theta s - \chi\mu\tau s - \iota\mu s - \iota\mu\zeta a + \phi\iota\theta a + \chi\mu\tau a + \iota\mu a + \alpha\iota\theta + \alpha\iota\mu}{\mu(\iota\omega - \chi)(s-a)}$$

Along such a steady state, the degree of capacity utilisation will be as follows:

$$u^* = \frac{\mu\zeta s - \phi\theta s - \mu\omega\tau s - \mu s - \mu\zeta a + \phi\theta a + \mu\omega\tau a + \mu a + \alpha\theta + \alpha\mu}{\mu(\iota\omega - \chi)(s-a)}$$

The steady state inflation rate is provided by the following expression:

$$\pi^* = \frac{\theta(\phi s - a\phi - \alpha)}{s-a}$$

The mechanism of the business cycle in this model would approximately evolve in the following manner. Assume that initially that the economy is on an upswing phase of the business cycle which implies that the degree of capacity utilisation is rising. This increase in the degree of capacity utilisation will have multiple effects whose temporal sequence would depend on the values of the three speeds of adjustments and other parameters: one, this increase in the degree of capacity utilisation will increase the target and therefore the actual ratio of investment to the capital stock; two, this increase in the ratio of investment to the capital stock will increase the rate of profit and this in turn will further increase the target and therefore the actual ratio of investment to the capital stock; three, the increase in the degree of capacity utilisation will increase the bargaining power of workers and therefore increase the rate of growth of male wages ; four, the increase in the degree of capacity utilisation will

increase the gender wage share differential which will moderate the impact of the rise in the male wage on the rest of the economy.

If it is assumed that the rate of inflation does not change immediately since the target share of profits is a constant then this rise in both wage rates will lead to a fall in the share of profits. This fall in the share of profits will lead to a decrease in the degree of capacity utilisation and this in turn will further increase the target and therefore the actual ratio of investment to the capital stock with subsequent changes in the same direction due to a further rise in the rate of profit.

Once the actual share of profits falls short of the target share of profits of firms, prices will be increased by firms. If this increase in prices is sufficiently large then this will lead to a rise in the share of profits which will have a negative impact on the future values of the target and therefore the actual ratio of investment to the capital stock. Since this decline in the actual ratio of investment to the capital stock will reduce the rate of profit there will be a further decline in target and therefore the actual ratio of investment to the capital stock.

This increase in the share of profits will through its negative impact of the degree of capacity utilisation lead to a fall in the bargaining power of workers which will reduce wages but the gender wager share differential will fall resulting in some moderation of this fall in the bargaining power of workers.

Distinct from the downturn in the business cycle being initiated by the rise in the rate of inflation exceeding the rate of growth of the wage rate, a downturn in the business cycle may also be initiated or strengthened by the actual ratio of investment to the capital stock eventually rising faster than the target share of investment to the capital stock. The impact of this eventual exceeding of the target share of investment to the capital stock by the actual share of investment to the capital stock will work itself out in the same manner as discussed above. In other words, both income distribution and investment dynamics will tend to work together to keep the business cycle persistent.

The gender wage share differential tends to have a stabilising role on the business cycle. During an upturn in the business cycle, the restrained rate of increase of the female wage rate (due to a rise in the gender wage share differential on account of the rise in the degree of capacity utilisation) will tend to moderate the amplitude of the business upswing and its duration. Likewise, during a downturn in the business cycle, a fall in the gender wage share differential (due to a fall in the degree of capacity utilisation) will tend to moderate both the amplitude and duration of the downswing in the business cycle.

3. An Empirical Examination of the Cyclical Trajectory of the Gender Wage Share Differentials: Estimation Procedure

We empirically estimate the following gender wage share differential equation from the model.

$$\frac{1}{j}\frac{dj}{dt} = \sigma(\tau + \iota u - j)$$

In Section 2 above, we had assumed that ι>0, i.e., the gender wage share differential is pro-cyclical. We examine the empirical aspect of this assumption in this section. The estimation is carried out in a two-step procedure. We first undertake a Blinder-Oaxaca decomposition exercise to decompose the gender wage share differentials into an "explained" (due to observable characteristics like education, marital status, age and urban location of work) and an "unexplained" component (attributed to discrimination or unobservables).

As described in the theoretical section above, we define gender wage share differential as

$$j = 1 - \frac{w_F L_F}{w_M L_M}$$

$$ln\ (1\text{-}j) = ln\ (\frac{w_F L_F}{w_M L_M}) = ln\ (w_F L_F) - \ln\ (w_M L_M)$$

The wage earnings equation is separately estimated for each group-males and females, with a semi logarithmic form

$$ln\ (w_i L_i) = Z_i'\beta + u_i$$

where $w_i L_i$ is the earning of the *ith* worker,

Z_i' is the vector of chracteristics, β is the vector of coefficients and u_i is the disturbance term.

Let $j = 1 - \frac{w_F L_F}{w_M M}$

Then, $ln\ (1\text{-}j) = ln\ (w_F L_F) - ln\ (w_M L_M)$

By the properties of OLS,

$$ln\ (\overline{w_M L_M}) = \overline{Z}_M'\hat{\beta_M}$$

And, $ln\ (\overline{w_F L_F}) = \overline{Z}_F'\hat{\beta_F}$

where $\overline{Z}_M'$ and $\overline{Z}_F'$ are vectors of the mean values of regressors for males and females respectively. And, $\hat{\beta_M}$ and $\hat{\beta_F}$ are the corresponding vectors of estimated coefficients.

From above, we get

$$ln\ (1\text{-}j) = \overline{Z}_F'\hat{\beta_F} - \overline{Z}_M'\hat{\beta_M}$$

Let $\Delta\overline{Z'} = \overline{Z}_F' - \overline{Z}_M'$

And $\Delta\hat{\beta} = \hat{\beta_F} - \hat{\beta_M} \rightarrow \hat{\beta_F} = \Delta\hat{\beta} - \hat{\beta_M}$

Then, $ln\ (1\text{-}j) = \Delta\overline{Z'}\hat{\beta_M} - \overline{Z}_F'\Delta\hat{\beta}$

This represents the decomposition of the wage share differential into the estimated effects of the differences in individual characteristics and the estimated effects of discrimination

respectively[9]. We proceed with this method of empirical exploration as a first approximation since we are aware that over time individual characteristics too are linked to social processes such as discrimination.

The Z vector consisted of labour force characteristics for males and females such as having completed upper secondary education, urban location of work, being married as the marital status and belonging to the age group 35-44. This age group was taken because it roughly corresponds to the age women have young children given that such direct data was largely unavailable.

In the second stage of the estimation process, the unexplained part of the wage share differential was then regressed on capacity utilization rates and the overall unemployment rates.

4. Data

We took a set of seven developed countries to examine the empirical validation of the model presented in Section 2. The set of developed countries include United States, United Kingdom, Canada, Germany, France, Japan, and Korea. Depending on the data availability and continuity, the sample sizes may vary for each country.

The time series used were the capacity utilization rates, wage share differentials (constructed), labour force characteristics like having completed upper secondary education, being married as the marital status, belonging to age group 35-44, and location of work (urban).

Capacity utilization rate data was sourced from OECD for US and Canada. For Germany, France, and Korea, we used Bundesbank calculation based on data of the European Commission - Directorate-General for Economic and Financial Affairs (DG ECFIN). Capacity utilization index for Japan was sourced from Ministry of Economy, Trade and Industry (METI). UK capacity utilization data was obtained from NACE 2 database, for total industry.

Gender wage gap data: OECD - This dataset contains gender wage gaps defined as the unadjusted difference between median wages of men and women relative to the median wages of men in the same decile, expressed as a percentage.

Labour force participation rates (LFPRs), and labour force characteristics like upper secondary education, marital status, age and the location (urban) are taken from International Labour Organization (ILOStats).

5. Results and Discussion

Preliminary statistics are reported in Table 1. The range of capacity utilization rates seems to be similar across countries, with the minimum values during recessions and downturns ranging from 65 percent to around 91 percent during expansions. Alongside, the "*j*", referring

[9] We have used the fact that for 0<j<1, log (1-j) and log j are mirror images of each other around the point j=0.5

$$ln\, j = -\,[\Delta\overline{Z}'\hat{\beta}_M - \overline{Z}_F'\Delta\hat{\beta}]$$

to the raw gender wage share differentials constructed from the OECD gender wage gaps have consistently been falling for all the countries in the sample (see Figure 1). The two components of the gender wage share differentials, i.e. wage gaps and employment gaps (median values reported in Table 1), are presented as scatter-plots in Figure 2. Both these components have been registering a decline over time, and seem to move in the same direction. It has been usual in the orthodox economics literature to attribute this decline to convergence in human capital characteristics between male and female labour force (see e.g. Kassenboehmer and Sinning, 2014; O'Niell and Polachek, 1993 among others).

Accordingly, in the first stage of the estimation process, as described in section 3, we undertook to decompose the gender wage share differential into an explained component, attributable to these characteristics, and the remainder as an unexplained component. This was done using the Blinder-Oaxaca technique. Results are correspondingly reported for the two steps separately.

Table 2 presents results from the first stage of the estimation process, the Blinder-Oaxaca decomposition. We denote upper secondary educational attainment as the variable education, marital status of being married as variable marriage, belonging to age group 35-44 as age and urban employment location as explanatory factors in the Blinder Oaxaca equations. For Japanese labour force, data for most characteristics were unavailable, the decomposition uses only the age-related variable. Across the set of countries studied, we find that education and urban location of employment remain significant explanatory factors for male earnings, while for females, age is also an important factor.

With the exception of UK, all countries observe education positively impacting the wage earnings for males and negatively for females. This seems to give strength to the observation that gender wage gaps remain larger at the higher deciles than lower ones i.e. women are disproportionately represented at the relatively lower end of the wage spectrum. Urban location of work promises higher female earnings, and there seems to be a marriage penalty on earnings for women over time in Germany, the variable is insignificant in the UK and France.

After the effect of these explanatory factors was separated, we obtained the "unexplained" or, what is traditionally referred to (with the aforementioned caveat) as the discriminatory component of earnings differential. We eliminated the trend in the residual series so obtained by fitting a linear trend-line, and thereby derived the cyclical component. This wage share differential was then regressed on capacity utilization rates and overall unemployment rates in the second stage of the estimation process.

Table 3 shows the results from the second stage of estimations. Corresponding graphs are presented in Figures 3 through 9. We obtain a positive and significant coefficient for capacity utilization rate for all countries of study, except Germany. The coefficient for capacity utilization lies in the range of 5-8 percent for US and other European countries, while it stands between 1-3 percent for Asian economies, Japan and Korea. This validates the implications of the theoretical model, and implies that when the economy is in an expansionary mode, wage share differentials rise, and decline whenever there are recessions. In other words, during expansions, wage shares pertaining to males rise relative to women, and during recessions, wage shares of women rise relative to men even though the share of wages of workers of all genders may fall during a recession or business cycle downswing.

We have previously set out theoretically in outline of some reasons for why the wage share differential is an increasing function of the degree of capacity utilisation. These include gender wise disproportionately segmented employment of men in sectors which are more pro-cyclical, gender wage ratio is pro-cyclical and the labour market impact of women being disproportionately burdened with the tasks of unpaid care work. Empirical support for the first factor is available. It has also been documented that female unemployment situation deteriorated less than that for men during downswings in the US (Johnson, 1983; Podgursky, 1984). This segmentation effect may arise from the fact that women are usually observed to be employed in sectors less exposed to the vagaries of cyclical fluctuations though they receive lower wages compared to men. This may include paid care work, which may be relatively less adversely affected even in recessionary times when compared to paid work undertaken by men.

6. **Conclusion**

In this paper we set out a Kaleckian macrodynamic model with conflict inflation and an endogenous gender wage share differential. We then examined how the gender wage share differential along with the share of profits, degree of capacity utilisation and the rate of growth move along a cyclical trajectory. The empirical exercise employed a two-stage estimation process, wherein the residual unexplained component of the wage share differential, from Blinder-Oaxaca decomposition was regressed on capacity utilization rates. The empirical analysis, conducted on a set of seven developed countries, i.e. US, UK, Germany, Canada, France, Japan and South Korea, seems to indicate that the gender wage share differential is mostly pro-cyclical for the countries in question.

Further theoretical and empirical questions in this research direction include examining the role of various types of government policy in reproducing gender wage share differentials, exploring whether and to what extent the purportedly non-discriminatory component is itself correlated with the process of gender discrimination over time and the similarities and differences between the cyclical trends in the gender wage share differential between developed and developing countries.

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Table 1. Preliminary statistics

	Capacity utilization rates		Median raw wage gap (%)	Median employment gap (%)
	Maximum	Minimum	$[1-(w_F/w_M)]^*100$	$1-(L_F/L_M)]^*100$
United States	91.13	65.32	23.60	16.05
United Kingdom	85.15	68.18	23.70	16.96
Canada	87.10	73.05	20.20	14.44
France	86.90	73.80	26.00	17.34
Germany	89.70	72.30	17.00	22.38
Japan*	11.75	-34.00	34.60	30.32
Korea	80.70	65.02	39.30	31.85

*Japan's capacity utilization is an index, sourced from METI

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Table 2: Stage 1 Regressions: Blinder-Oaxaca decomposition

	Dependent variable: $w_i L_i$		
	Male	Female	Difference ($\Delta\beta$)
United States			
Constant	4.841*** (6.851)	-2.717*** (-29.72)	-7.558**
Education	0.019*** (4.508)	-0.031*** (-8.51)	-0.05**
Marriage	-0.018*** (-4.397)	0.032*** (9.73)	0.05*
Age	-0.052*** (-6.962)	0.028*** (20.960)	0.08**
United Kingdom			
Constant	0.692** (2.249)	-7.330*** (-5.350)	-8.022
Education	-0.009*** (-6.807)	-0.005 (-0.678)	0.004*
Marriage	0.006 (0.709)	0.029 (1.266)	0.023*
Age	0.016*** (3.386)	0.070*** (5.458)	0.054**
Urban	-0.027** (-2.183)	0.002** (2.591)	0.029*
Germany			
Constant	15.253*** (3.379)	6.381*** (5.771)	-8.872*
Education	0.169*** (3.892)	-0.002 (-0.099)	-0.171**
Marriage	0.213*** (2.944)	-0.076*** (-3.018)	-0.289**
Age	-0.035 (-0.698)	0.015 (1.138)	0.05**
Urban	-0.437*** (-4.838)	0.105*** (4.488)	0.542**
France			
Constant	17.513*** (4.351)	7.863*** (9.843)	-9.65*

Education	0.078*** (5.038)	-0.024*** (-5.061)	-0.102**
Marriage	--	--	--
Age	-0.144** (-3.438)	0.007 (0.457)	0.151
Urban	-0.005 (-0.089)	0.037 (0.270)	0.042**
Canada			
Constant	3.270 (0.527)	-3.681*** (-4.482)	-6.951*
Education	0.087*** (3.451)	-0.016*** (-4.258)	-0.103**
Marriage	-0.116* (-1.871)	0.076*** (5.033)	0.192**
Age	-0.017 (0.7656)	-0.009 (-0.703)	0.008
Japan			
Constant	-64.610*** (-13.443)	-4.629*** (-14.438)	59.981
Education	--	--	--
Marriage	--	--	--
Age	0.659*** (13.341)	0.058*** (12.213)	-0.601**
Korea			
Constant	5.475*** (12.220)	-1.389*** (-3.155)	-6.864*
Education	--		--
Marriage	--		--
Age	-0.059*** (-12.458)	0.014* (1.952)	0.073**

t statistics are reported in parentheses.
***, ** and * Significant at 1 %, 5% and 10% levels of significance respectively

Table 3 Stage 2 Regressions: Relationship between gender wage share differentials and capacity utilization rates

	Dependent variable: gender wage share differential (unexplained)		
	Constant	Capacity utilization	Unemployment rate
US	-10.528*** (-17.010)	0.054*** (7.582)	0.126*** (6.934)
UK	-8.461*** (-6.856)	0.035** (2.250)	0.095*** (3.589)
Germany	-0.105 (-0.416)	0.001 (0.388)	0.001 (0.572)
France	-12.702*** (-3.991)	0.078** (2.172)	0.335*** (4.567)
Canada	-8.920*** (-6.133)	0.081*** (4.925)	0.158*** (3.214)
Japan	3.131*** (6.226)	0.032* (1.977)	-0.881*** (-5.441)
Korea	-4.817*** (-5.745)	0.050*** (3.839)	0.097** (2.280)

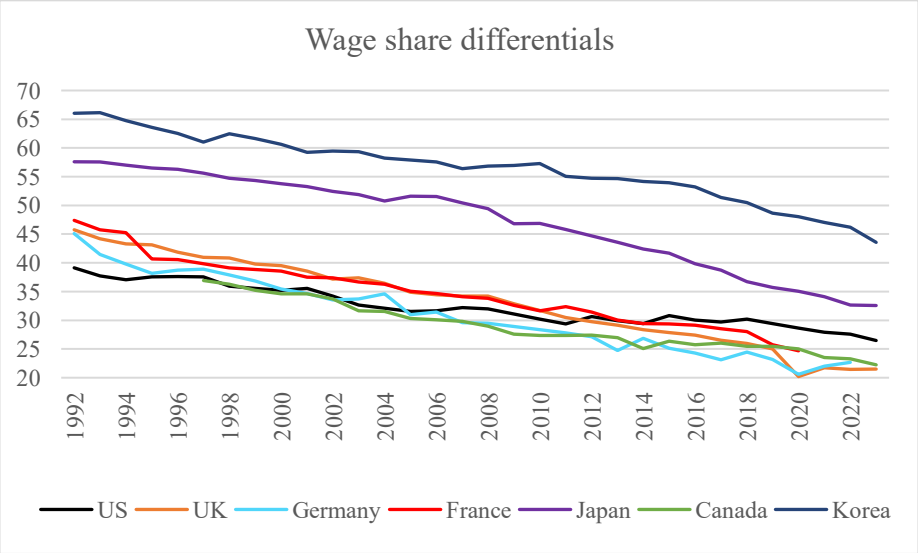

Figure 1 Wage share differentials (raw), based on author calculations from OECD gender wage gaps data

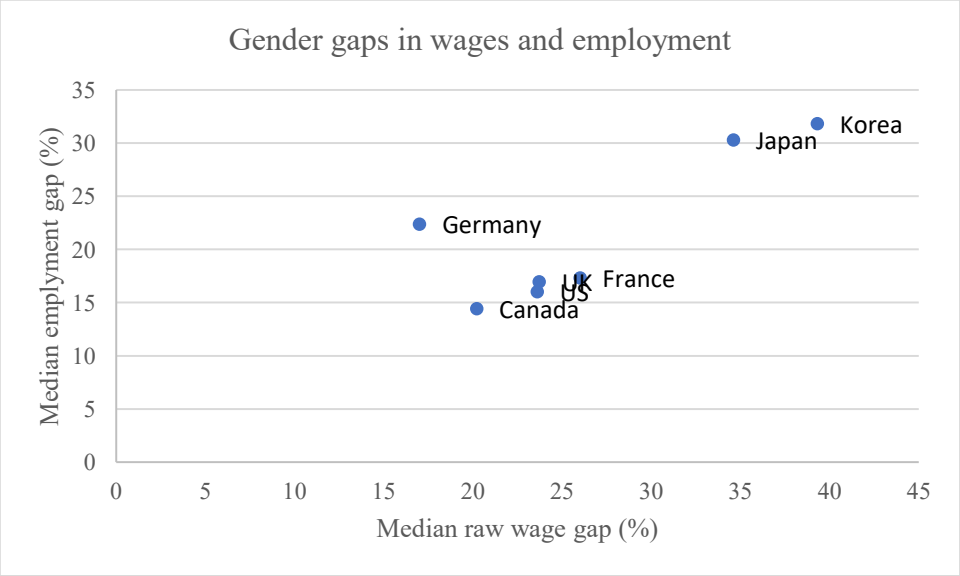

Figure 2 Components of wage share differentials - wage gaps and employment gaps

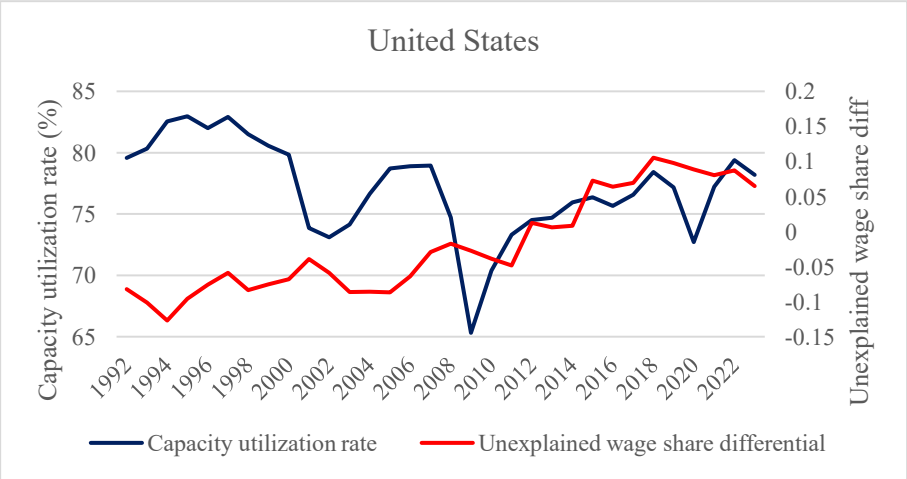

Figure 3. Capacity utilization rates and "unexplained" wage share differentials: US

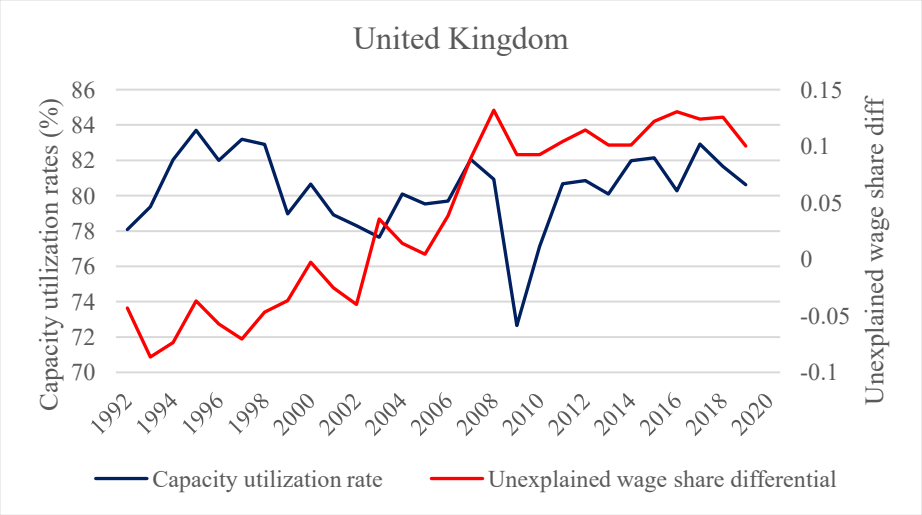

Figure 4. Capacity utilization rates and "unexplained" wage share differentials: UK

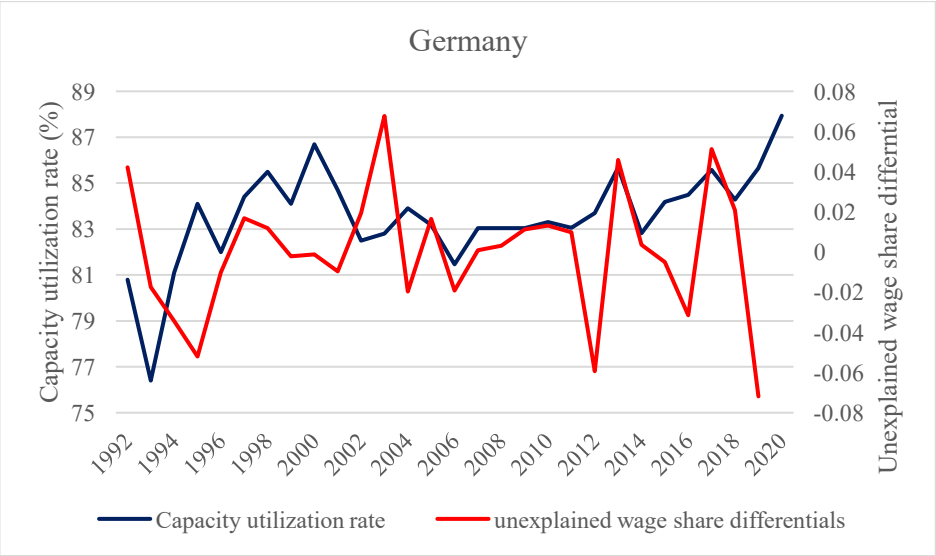

Figure 5. Capacity utilization rates and "unexplained" wage share differentials: Germany

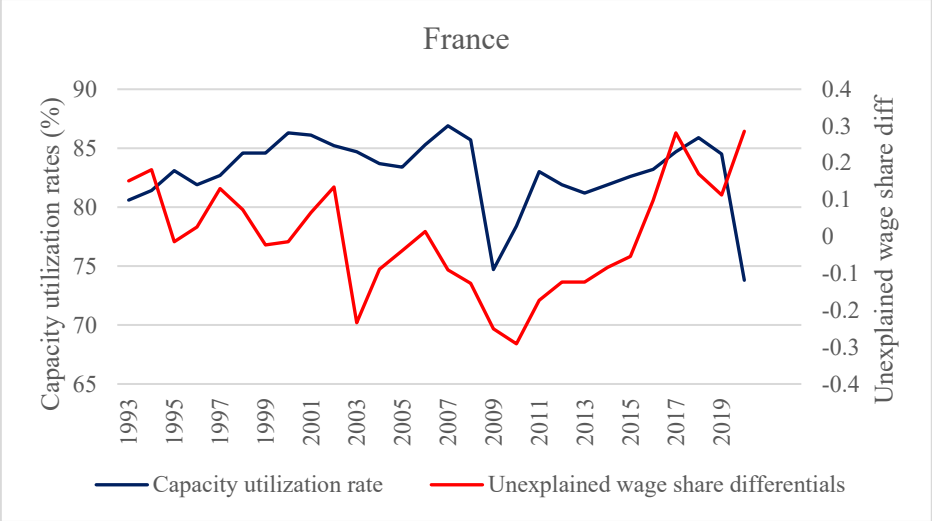

Figure 6. Capacity utilization rates and "unexplained" wage share differentials: France

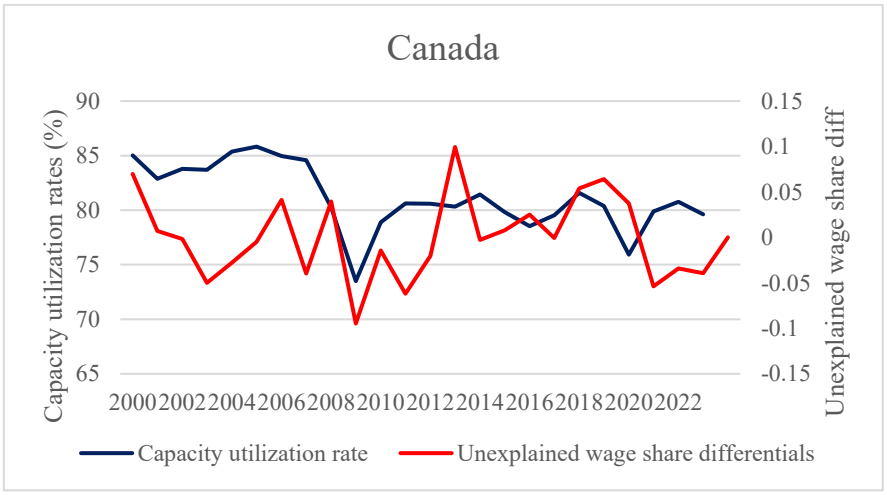

Figure 7. Capacity utilization rates and "unexplained" wage share differentials: Canada

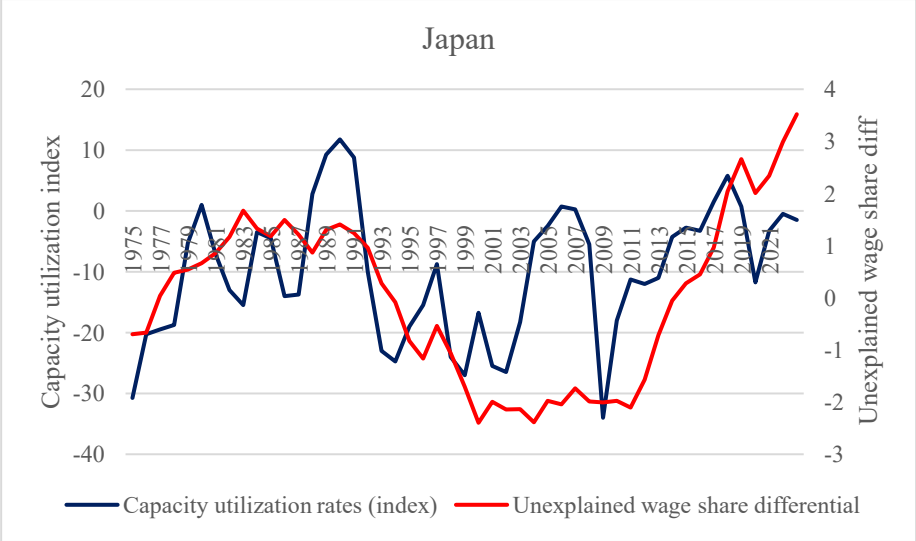

Figure 8. Capacity utilization rates and "unexplained" wage share differentials: Japan

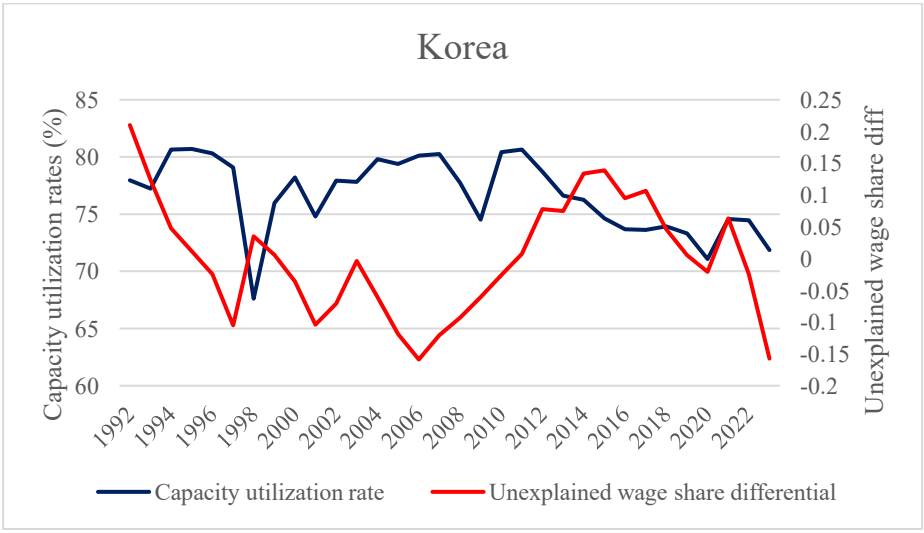

Figure 9. Capacity utilization rates and "unexplained" wage share differentials: Korea