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Social-economic Analysis on Gender Differences in Time Allocation

A Comparative Analysis of China and Canada

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I.   Introduction

It is widely acknowledged that women today get "the short end of the stick" because they perform more household duties than men do. Historically, such gender division of labour was accompanied by the fact that most women do not participate in the labour market. But such statement no longer holds true, more and more women are entering into the labour force, as well, issues on work place gender equality and gender equity have received increasing amount of attention. On the flip side, gender equality concerning household duties receives significantly fewer discussions, but the fact is whether being paid or not, whether in the office or at home, work takes away time from leisure and self-care, and women's time are taken away more than men's, hence the legitimacy of the statement at the beginning of my paper. To look into the contributing factors behind such phenomena, this paper aims to answer three questions:

1. How do social-economic characteristics such as marital status, education and income level impact Canadians' time allocation on difference activities?
2. What percentage of the Canadian gender gap in time allocation can be explained by social-economic characteristics such as marital status, education and income level?
3. How do Chinese residents differ from Canadian residents regarding time use patterns?

The first question is answered with multiple linear regression results in Section V; the second, with decomposition analysis results in Section V; and the third one is discussed using both multiple linear regression and decomposition analysis results.

Answers to these questions will deepen our understandings on the nature of gender equality issues, and among other positive implications, researchers have found associations between gender equality and long-term economic growth. (Agénor & Canuto, 2015)

Motivation

As far as I understand, economics is, fundamentally, a study of trade-offs; how to trade limited resource for maximum utility. I was intrigued by a resource that is scarce to everyone: time. I wanted to understand how people spend their time and what influences people to spend time on one thing over another. Time use data used in this paper shed light on these questions.

In 2008, the Chinese Bureau of Statistics conducted the first Chinese Time Use Survey (TUS hereafter). Based on the data collected, Dong and An (2008) found that Chinese men spend significantly more time on paid work while Chinese women spend fairly more time on unpaid household work; however, when the amount of time spent on paid and unpaid work was added together, Chinese women were found spending more time working than Chinese men, they are less capable in substituting market work for domestic labour, resulting the Chinese women to be burdened with more work and less time for leisure and self-care. This research provided insights on the time use pattern and gender differences in time allocation in China, and it partially triggered the three questions this paper aims to answer.

II.   Literature Review

Several papers were examined to provide a background on time use research. Craig & Bittman (2008) studied the incremental time cost of children through asking how households with varying numbers and ages of children differ in time allocation and how the presence of children in a household impact time allocation. Gimenez-Nadal et al. (2011) provided more evidence using the 2002 Spanish Time Use Survey, they found the presence of children during adult care increases the probability of caregiving but the presence of an additional child below the age 18 reduces such probability.

Marshall's (2006) study with time use data found that although gender differences persist in the division of labour, such gender gaps are steadily diminishing. Again with time use data, Marshall (2011) looked into the generational change in paid and unpaid work, she concluded that despite socioeconomic characteristic changes in different generations, time spent on paid work remain relatively stable; however, time spent on unpaid household work has increased over time.

Three papers gave substantial guidance to the methodology of my research. As aforementioned, Dong and An (2008) partially triggered the existence of this paper, and as shown in the Methodology section below, the choices of multiple linear regression variables closely follow Dong and An's (2008) to ensure comparability.

Pailhé et al. (2014) performed a comparative analysis of France, the Netherlands, the UK, and the United States to look into the gender gap in household unpaid work. They found a slight decrease of gender gap over time, using decomposition analysis, they attribute the trend to changes in practices for a given characteristic, rather than changes in the population characteristics.

III.   Methodology

Multiple Linear Regression

To identify how social-economic characteristics impact time allocation among paid work, unpaid work, and leisure and self-care, I analyzed the Canadian TUS data with multiple linear regression. Dong and An (2008) used the seemingly unrelated regression (SUR) technique for their analysis on the comparable Chinese TUS data; the regressions results they uncovered will be utilized in this paper for comparative analysis between China and Canada. The rationale of choosing SUR is to enforce two restrictions: First, the sum of intercepts should equal to 168 hours, which is the total amount of hours in a week. Second, the sum of coefficients should equal to zero due to compensating nature of trading off time on different activities. However, at times these two conditions are met without enforcement from the use of SUR, such as how the multiple linear regression results from my analysis are within these restrictions without the use of SUR. Given that this study is not highly advanced, when planning for study method, the use of SUR did not seem to give out enough benefit to justify the cost it would have required.

The same independent and dependent variables were selected for this regression as Dong and An's (2008) to ensure the comparability of the two analyses. The regression function is shown below,

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \cdots + \beta_n X_n + \varepsilon$$

(1)

$$\hat{y} = b_0 + b_1 x_1 + b_2 x_2 + \cdots + b_n x_n$$

$$n = 1, 2 \dots, 24$$

where Y represents the dependent variable, β_0 represents the intercept and the coefficient (β_n) represents the impact of the independent variable (X_n). Two separate sets of regressions were run for male and female, each set includes three regressions given the three different dependent variables being paid work, unpaid work, and leisure and self-care; all regressions use the 24 independent variables representing the social-economic characteristics.

The independent variables include four continuous variables being household size, years of schooling, unearned monthly income and individual wage. Years of schooling are estimations based on the categories provided by the Canadian TUS data, dummy variables were not employed in this case to ensure consistency with how Dong and An (2008) conducted their research. Unearned monthly income in Canadian dollars was determined by subtracting personal income from household income. To organize the raw TUS wage data into a form that can be accepted as inputs into regression function (1), a separate multiple linear regression was used for wage estimation. The results of the wage regression can be found in Appendix 1. The independent variables for the wage regression are years of estimated experience and its squared term, years of schooling, and urban and province dummy variables.

The remaining independent variables for function (1) are 20 dummy variables representing marital status, presence of child aged six years or younger, age, employment status, and location and province of residence. The dependent variables are derived from the Canadian TUS micro-data and converted from minutes per day to hours per week for the aforementioned comparability.

Oaxaca-Blinder Decomposition Technique

The Oaxaca-Blinder decomposition technique was developed independently by Ronald Oaxaca (1973) and Alan Blinder (1973) for analyzing wage gaps, the method has been widely used for researching wage discrimination in the labour market, both in economics and sociology studies. (Hernandez et al., 2009) The technique decomposes the overall difference into difference that can be explained by the wage model, and difference in the structure of the model; the latter unexplained difference represent potential discriminations in the labour market. (Oaxaca and Ransom, 1999)

For the purpose of this paper, the decomposition technique is used to decompose the total difference $(\hat{y}^A - \hat{y}^B)$ on time allocation into explained difference $[\beta_i^A (\bar{x}_i^A - \bar{x}_i^B)]$ and unexplained difference $[\bar{x}_i^B (\beta_i^A - \beta_i^B)]$. The decomposition function is shown below,

$$\hat{y}^A - \hat{y}^B = \sum_{i=0}^{n} \beta_i^A (\bar{x}_i^A - \bar{x}_i^B) + \bar{x}_i^B (\beta_i^A - \beta_i^B)$$

(2)

where A and B represents the two focal groups between which the total difference exists, and i is the index of independent variables.

The explained difference is induced by differences in social-economic characteristics, theoretically, such difference would cease to exist if the two focal groups possess the exact same social-economic characteristics. The unexplained difference is the remaining total difference after subtracting the explained difference, it is not explained by variances in social-economic characteristics but other uncaptured variables; they will *not* cease to exist even if the two focal groups possess the exact same social-economic characteristics. The explained differences can be denoted as the X bar differences because they are explained by the independent variables (X_i). The unexplained differences can be denoted as beta differences as they are calculated using the coefficient (β_i).

Five sets of differences on time allocation are decomposed with the technique: 1) gender gap within Canada, 2) gender gap within China, 3) time allocation gap between Chinese and Canadian female, 4) time allocation gap between Chinese and Canadian male, and 5) the differences between gender gaps in China and Canada.

IV.   Data selection

Canadian Time Use Data

Given that part of this paper was inspired by Dong and An's (2008) analysis in which the 2008 Chinese TUS data are used, I obtained most comparative Canadian TUS data: the 2010 General Social Survey conducted by Statistics Canada. In which, time use data of 15,390 participants are captured.

The original micro-data obtained from the survey results were refined and coded. Social-economic characteristics such as urban, married, having young child(ren) aged six years or younger, age, employment status, and province of residence were coded into dummy variables following the methodology Dong and An (2008) used. The resulted constant from such coding is a rural Canadian resident of either gender between the age of 15 and 24 years who has no spouse, no child aged six years or younger, is currently employed, and lives in the province of British Columbia, with all continuous variables assumed to be zero.

Continuous variables[1] were estimated carefully given that the lack of direct information. Take hourly wage as an example, a regression function aforementioned was used to estimate the wage of some survey participants. In order to arrive to the regression function, hourly wage was obtained through dividing personal income in a year by hours worked in a year, with hours worked in a year calculated through multiplying weeks worked in the past year by average hours worked per week.

Throughout the coding process, 3,422 samples were found to be inadmissible to my analysis given the lack of key information, leaving the applicable sample size of my research being 11,968 individuals aged 15 years or older residing in 10 different Canadian provinces, among which 6,538 are women and 5,430 are men.

Table 1 specifies individual social-economic characteristics by gender in Canada. Data included this table are about the independent variables. From the table, we can see obvious differences between women and men in marital status, household size, log monthly unearned income, and inactivity rate.

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[1] Except for household size, for which the micro-data provided all information required.

Table 1: Individual social-economic characteristics by gender in Canada

	Female	Male	Diff.
Urban	75.7%	73.3%	0.023
Has spouse	55.5%	64.8%	-0.093
Has child 0-6	14.1%	12.3%	0.018
Household Size	2.382	2.494	-0.112
Age 25-34	14.5%	12.6%	0.018
Age 35-44	17.7%	17.1%	0.007
Age 45-54	20.8%	20.7%	0.001
Age 55-64	20.4%	21.0%	-0.006
Age 65-74	12.1%	13.4%	-0.014
Age 75 and over	8.8%	7.5%	0.013
Schooling (Yrs)	13.806	13.761	0.045
Log unearned income per mth	2.622	3.107	-0.484
Log hourly wage	3.929	3.935	-0.006
Unemployed	1.7%	3.2%	-0.016
Inactive	51.1%	38.4%	0.127
NL	6.9%	6.0%	0.008
PEI	3.6%	3.1%	0.005
NS	7.0%	6.3%	0.006
NB	5.5%	5.3%	0.001
QC	14.7%	14.6%	0.001
ON	27.5%	28.9%	-0.014
MB	6.1%	6.3%	-0.001
SK	6.5%	6.9%	-0.005
AB	8.4%	8.2%	0.002

Table 2: Average time spent on activities by Canadian residents

hrs./wk.	Female	Male	Diff.
Paid work	20.982	28.551	-7.569
Unpaid work	31.557	22.262	9.294
Non-work	115.461	117.187	-1.726
Total	168.000	168.000	0.000

Table 2 specifies average time spent on activities by Canadian residents aged 15 years and older, the unit is hours per week. From the data presented, we can tell that, in an average week, Canadian women spend 7.6 hours less than Canadian men on paid market work, 9.3 hours more on unpaid household work, and 1.7 hours less on leisure and self-care.

Chinese Time Use Data

The Chinese TUS data come from the 2008 National Time Use Survey conducted by the Chinese Bureau of Statistics. The survey covers 37,142 individuals aged of 15 and 74 years residing in 10 different Chinese provinces, among which 18,927 are women and 18,215 are men. Based on which Dong and An (2008) concluded obvious gender differences in time use patterns: men were found to spend fairly more time on paid work while women were found to spend significantly more time on unpaid work; in addition, when the amount of time spent on paid and unpaid work was added together, women were found to spend more time working than men, which leaves them with less time for leisure and personal care. Table 3 below specifies average time spent on activities by Chinese residents between the age of 15 and 74 years, the unit is hours per week.

Table 3: Average time spent on activities by Chinese residents

hrs./wk.	Female	Male	Diff.
Paid work	30.7	42	-11.3
Unpaid work	27.3	10.6	16.7
Non-work	109.8	115.2	-5.4
Total	167.8	167.8	0

Compare to Canadian residents, the Chinese gender gap in each category is more distinct. Table 3[2] shows that, in an average week, Chinese women spend 11.3 hours less than Chinese men on paid market work, 16.7 hours more on unpaid household work, and 5.4 hours less on leisure and self-care.

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[2] The table was shown in Dong and An (2008), and I verified the data against data issued by the Statistics Bureau of China. However, neither provided enough detailed information and there are issues due to rounding.

Comparison

The comparison of Chinese and Canadian data shows that 1) the gender gaps in China and Canada share the same directions: men are found to spend more time on paid work while women are found to spend more time on unpaid work, in addition, women are left with less time for leisure and self-care than men; but 2) the gender gap is wider in China than in Canada; therefore 3) gender division of labour is practised more in China than in Canada; and lastly, 4) Chinese women are burdened with more work and they have less time for leisure and self-care than any other three groups.

Table 4: Multiple linear regression estimates of the determinants of time allocation by gender

| | | Female | | | Male | |
	Paid work	Unpaid work	Non-work	Paid work	Unpaid work	Non-work
Constant	42.426	-0.761	126.335	38.281	-3.512	133.231
Urban	-0.032	-1.178	1.210	-3.252	-1.303	4.555
Has spouse	-0.392	4.453	-4.061	1.360	2.228	-3.588
Has child 0-6	0.975	13.434	-14.409	-2.524	9.449	-6.925
Household Size	-0.601	2.866	-2.264	0.717	0.692	-1.409
Age 25-34	-1.537	13.074	-11.537	3.081	11.738	-14.819
Age 35-44	-0.658	17.041	-16.383	5.619	14.205	-19.824
Age 45-54	-1.360	17.689	-16.329	2.829	14.575	-17.405
Age 55-64	-3.964	17.707	-13.743	-1.567	15.814	-14.247
Age 65-74	-6.699	15.335	-8.636	-6.105	15.599	-9.494
Age 75 and over	-32.913	13.043	19.869	-37.473	9.665	27.809
Schooling (Yrs)	-6.811	10.686	-3.875	-6.899	12.754	-5.855
Log unearned income per mth	0.251	0.205	-0.457	0.217	0.319	-0.536
Log hourly wage	0.067	-0.188	0.121	-0.037	-0.014	0.051
Unemployed	-0.719	-0.606	1.325	0.880	-0.009	-0.870
Inactive	-29.744	11.276	18.469	-30.547	7.707	22.840
NL	-1.731	1.757	-0.026	-4.150	4.413	-0.263
PEI	-0.005	-1.681	1.686	-1.770	-2.607	4.377
NS	-1.601	1.693	-0.093	0.808	2.721	-3.529
NB	-0.751	-0.082	0.833	-3.150	4.252	-1.102
QC	-0.321	-2.394	2.715	-1.957	-0.614	2.570
ON	0.167	1.050	-1.217	-1.027	1.225	-0.198
MB	-2.371	1.873	0.498	-5.014	0.998	4.015
SK	-1.865	-0.572	2.436	3.466	0.327	-3.793
AB	-0.519	0.348	0.170	1.822	-1.170	-0.651
R-squared	0.354	0.196	0.296	0.371	0.104	0.342
N	6,538			5,430		

V. Estimation and Interpretation of the Results

Regression Results and Interpretation

To uncover how social-economic characteristics impact time allocation, the results from the multiple linear regression are presented in Table 4 above.

From the list of coefficients, many conclusions can be reached. First, social-economic characteristics that induce women to spend significantly more hours on unpaid work include: having a spouse, a young child aged between zero to six years at home and a larger household size. However, such increase in unpaid work hours is not compensated by a decrease in paid work hours. Judging by the comparatively small decrease in paid work hours, the trade-off is between housework and leisure and self-care. Almost all of the increase in unpaid work comes from decrease in women's time for leisure and self-care. For married men with young child at home and a larger household size, the increase in unpaid work is less significant, and the trade-off is less restricting, especially when it comes to having young children, men are able to substitute paid work (instead of leisure) for unpaid work.

The second one is about age, for both men and women, as they grow older from the age of 25 years they are seen to spend more and more time on unpaid home production. The increases in unpaid work hours are roughly accompanied by decreases in paid work for both gender, signalling a changing focus from work to home life, or an attempt at work-life balance. The climbing of unpaid work hours reach its peak at the age between 55 and 64 years and starts to decline afterwards; an potential explanation[3] is that after children reach their early adulthood and move out of home, parents between the age of 55 to 64 years are obligated to less household responsibilities.

The years of education factor presents a baffling image as the coefficients signal that more schooling has an adverse effect on time spent on paid work; assuming that higher education leads to higher wage[4], one would expect the opposite from the above result. However, the comparable Chinese coefficients generated by Dong and An (2008) show similar effects of education. I acknowledge that such effects warrant further investigation given opportunities of future research.

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[3] Raised by Professor Cristina Echevarria.
[4] This is supported by the education coefficient generated in the wage regression.

On the income side, increase in unearned income leads to a small increase in total work hours for both men and women. However, increase in wage triggers a slight substitution effect for women as they put more time into paid work, but a slight income effect for men as they put more time into leisure and self-care.[5] As expected, inactivity leads to significantly decreased amount of time spent on paid work and fairly increased amount of time spent on unpaid work.

Comparison to the SUR Estimates

There are two obvious differences between the regression results generated with the comparable Canadian and Chinese TUS data. The SUR estimates generated by Dong and An (2008) are included in Appendix 2.

First, similar to Canadians, being married and having young child at home increase the unpaid work hours for both Chinese men and women, but the gap between these increases are noticeably wider for the Chinese residents than their Canadian counterparts. This signals that although both Chinese and Canadian women are burdened more with household responsibilities than their male counterparts, the degree of such uneven household work allocation is more severe for Chinese women and the gender gap of unpaid household work hours is wider in China.

Second, higher wage has a noticeably more significant impact on Chinese than Canadians, the former spends observably more hours when facing higher wage unlike the latter.

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[5] Wage regression results are presented in Appendix 1.

Table 5: Decomposition results for the difference between Canadian female and Canadian male

	Paid work		Unpaid work		Non-work	
	Explained	Unexplained	Explained	Unexplained	Explained	Unexplained
Constant	0.000	4.144	0.000	2.751	0.000	-6.896
Urban	-0.001	2.361	-0.027	0.092	0.028	-2.453
Has spouse	0.036	-1.135	-0.413	1.441	0.377	-0.306
Has child 0-6	0.018	0.431	0.246	0.490	-0.264	-0.921
Household Size	0.068	-3.287	-0.322	5.421	0.254	-2.134
Age 25-34	-0.028	-0.583	0.238	0.169	-0.210	0.415
Age 35-44	-0.004	-1.070	0.112	0.484	-0.108	0.587
Age 45-54	-0.002	-0.866	0.024	0.643	-0.023	0.222
Age 55-64	0.025	-0.504	-0.113	0.398	0.088	0.106
Age 65-74	0.091	-0.080	-0.208	-0.035	0.117	0.115
Age 75 and over	0.011	0.473	0.009	-1.567	-0.021	1.094
Schooling (Yrs)	-0.033	0.323	0.091	-0.541	-0.059	0.218
Log unearned income per mth	0.004	-6.289	0.004	-2.348	-0.008	8.638
Log hourly wage	0.473	0.026	-0.179	0.116	-0.294	-0.142
Unemployed	-4.187	1.750	1.659	1.297	2.528	-3.047
Inactive	-0.089	0.007	0.139	-0.155	-0.050	0.148
NL	-0.015	0.146	0.015	-0.160	0.000	0.014
PEI	0.000	0.055	-0.008	0.029	0.008	-0.084
NS	-0.010	-0.153	0.011	-0.065	-0.001	0.218
NB	-0.001	0.128	0.000	-0.231	0.001	0.103
QC	0.000	0.239	-0.002	-0.260	0.002	0.021
ON	-0.002	0.345	-0.014	-0.051	0.017	-0.294
MB	0.003	0.165	-0.002	0.055	-0.001	-0.220
SK	0.009	-0.370	0.003	-0.062	-0.012	0.433
AB	-0.001	-0.192	0.001	0.125	0.000	0.067
Subtotal	-3.634	-3.935	1.262	8.033	2.373	-4.098
Total Gaps	-7.569		9.294		-1.726	
% explained	48%		14%		-137%	

Decomposition Results and Interpretation

As aforementioned, decompositions are conducted between five groups,

1. Canadian female and Canadian male,
2. Chinese female and Chinese male,
3. Chinese female and Canadian female,
4. Chinese male and Canadian male, and
5. Gender gap in China and gender gap in Canada,

for the three dependent variables aforementioned. The results of the first decomposition is shown as in Table 5, and the results for the other pairs can be found in Appendix 3.

Table 5 breaks down the total differences into explained and unexplained ones as stated in the methodology section. In the case of Canadian women and men, the total gender gap in terms of hours spent on paid work per week is -7.6 hours, meaning that Canadian women on average spent 7.6 hours less on paid work than Canadian men per week.[6] The decomposition analysis shows that 48% of the total gender gap is explained differences which can be attributed to differences in social-economic characteristics of Canadian men and women. Which means if Canadian women and men would possess the exact social-economic characteristics, the gender gap of time spent on paid work would be narrowed by 3.6 hours, leaving only 52% of the total gap, 3.9 hours, remains present. Among the 3.6 hours of explained differences, a large contributing factor is employment status, which is logically sound; the remaining factors include hourly wage, marital status and household size. Changes in these social-economic characteristics will have noticeable impact on the Canadian gender gap of time spent on paid work.

Unlike in the case of time spent on paid work, the chosen social-economic characteristics are not as capable in explaining the Canadian gender gap of time allocation on unpaid work and non-work; which means either the Canadian men and women are impacted in entirely different ways by the same social-economic characteristics when it comes to spending time on unpaid work and non-work, or there are other unidentified characteristics orchestrating the gender gaps of time allocation on unpaid work and non-work.

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[6] Such gender gap is consistent with the paid-work-hours difference in Table 2 above.

For the comparable decomposition analysis on the gender gap in China[7], 40% of the total gender gap of time spent on paid work can be explained by the chosen social-economic characteristics, meaning if the Chinese men and women would possess the same characteristics, only 60% of the gender gap on time spent on paid work would remain. As is in the Canadian analysis, the chosen social-economic characteristics are not as effective in explaining the gender gaps on time spent on unpaid work and non-work. However, given the zero-sum nature of trading-off time between different activities, explaining gender gaps of hours spent on paid work is effectively explaining gender gaps of hours spent on unpaid work and non-work in an indirect fashion.

For the third group, decomposition analysis shows that differences in social-economic characteristics can explain little of the differences in time allocation between Chinese and Canadian women. On the other hand, 36% of time variances concerning paid work between Chinese and Canadian men can be explained by the chosen social-economic characteristics[8], as well as 23% of the variances concerning unpaid work and 68% of the variances concerning non-work. Meaning that if Chinese men would have the exact same social-economic characteristics, their differences on time spent on paid work would decrease by 4.921 hours; unpaid work, 2.210 hours; and non-work, 2.705 hours.

For the last group[9], the chosen social-economic characteristics seem to offer little explanation for the differences between Chinese and Canadian gender gaps of time allocation. Meaning that even if Chinese women and men would differ in the same way as how Canadian women and men differ on social-economic characteristics like marital status, education and hourly wage, almost all differences between the gender gaps of the two countries would remain. However, the concept is insightful, if given the opportunity in the future, I am very interested in identifying social-economic characteristics that do explained the differences between the Chinese and Canadian gender gaps.

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[7] Please see Table A3 in Appendix 3.
[8] Please see Table A4 and A5, respectively, in Appendix 3.
[9] Please see Table A6 in Appendix 3.

VI.   Conclusions, Policy Implications and Limitations

Historically, women are expected to assume more household duties than men are. Such traditional expectation raises gender equality issues in today's society given increased female participation in the labour market. Time is a limited resource for everyone, and the inability to substitute market work for domestic labour leaves the women today with less time for their leisure and self-care.

To deepen understandings of gender equality, I have studied how social-economic characteristics such as marital status, education and income level impact the time use pattern for Canadian women and men; I have decomposed the Canadian and Chinese gender gaps into explained differences that can be attributed to the aforementioned social-economic characteristics and unexplained differences; I also performed decomposition analysis for differences in time allocation between Chinese and Canadian women, Chinese and Canadian men, and Chinese and Canadian gender gaps. As expected, my paper confirms the validity of the assertion that women get "the short end of the stick", and unfortunately, such effect is the most illustrated by Chinese women as a group. Out of considerations for Chinese women's well-being, greater policy attention should be directed to developing the economy in a more gender equitable manner.

For Canadians, change in life events such as being married, having young children and increasing number of household members increases unpaid work hours more for women than for men, given the lack of corresponding decreases in paid work hours, these changes ultimately leads to less time for Canadian women's leisure and self-care. Such phenomena is concerning for national well-being, as well, foresting gender equality is key to the Canadian economy's long-term growth.

Decomposition analyses showed that the chosen social-economic characteristics are more effective in explaining the gender differences in time spent on paid work than unpaid work and leisure and self-care. For example, 48% of the Canadian gender difference in time spent on paid work can be attributed to differences in social-economic characteristics while the number is only 14% for time spent on unpaid work. Results of the Chinese TUS data analysis generally agree with the Canadian ones except for wage, change in wage rate is seen to have a larger impact on Chinese residents.

My results suggest that most of the differences between Canada and China are due to differences in the levels and coefficients of wages, years of schooling and inactivity rates and urbanization. The implication of that is, as the Chinese economy becomes similar to the Canadian Economy in terms of

wages, years of education, urbanization, the Chinese gender gap will not disappear but would become similar to Canada. In other words, the gender issue will not be solved by market forces, but active policy intervention from the government may be required to achieve gender equality. For example, my results suggest that presence of children and household size are one of the important factors and policies targeted towards more unpaid work sharing within a household may help in reducing the gender gap in time use.

There are a few limitations associated with my paper. First, multiple linear regression was used instead of SUR, which means that the total of the intercepts and coefficients are not explicitly controlled; however, the accuracy of the Canadian dataset eventually revealed no need for the use of SUR: the multiple linear regression results do fall within the restrictions without being explicitly controlled. Second, the wage rate for roughly 30% of the Canadian sample population are estimated through a multiple linear regression function, therefore limiting the external validity of results reaching using this sample. Third, validity of the last four decomposition analyses are restricted given the lack of the detailed Chinese TUS micro-data. For the Canadian dataset, the gender gaps among paid work, unpaid work and non-work net out exactly when added together; but for the Chinese dataset, because the dataset obtained was already synthesized by the Statistics Bureau of China, it lacks a degree of precision, which, for example, eventually causes the Chinese gender gaps among paid work, unpaid work and non-work not being able to net out exactly when added together. Further research with the firsthand micro-data will provide more precision and validity to the comparative analysis.

Appendix 1: Wage Regression

Table A1: OLS estimates of wage equation by gender – Canadian

	Female	Male
Constant	32.369	-23.351
Urban	-16.643	19.250
Schooling (Yrs)	2.591	3.189
Experience	-0.543	-0.208
Experience-squared	0.031	0.052
NL	-31.010	-16.473
PEI	-43.229	-12.453
NS	-26.468	-27.166
NB	-30.129	-17.636
QC	-22.507	24.016
ON	-21.149	-15.053
MB	-28.638	-28.868
SK	-33.761	-29.634
AB	1.419	-9.517
R-squared	0.016	0.009
N	4,261	3,951

Appendix 2: SUR Estimates

Table A2: SUR estimates of the determinants of time allocation by gender – Chinese [10]

	Female			Male		
	Paid work	Unpaid work	Non-work	Paid work	Unpaid work	Non-work
Constant	36.743	9.986	121.270	50.244	1.830	115.925
Urban	-9.447	0.995	8.453	-14.143	3.092	11.052
Has spouse	-1.902	9.050	-7.148	3.886	1.066	-4.952
Has child 0-6	-5.382	9.252	-3.870	-1.057	3.308	-2.251
Household Size	0.300	-0.778	0.477	0.390	-1.353	0.964
Age 25-34	5.203	9.057	-14.260	6.575	4.500	-11.075
Age 35-44	4.923	10.411	-15.333	5.139	5.777	-10.916
Age 45-54	1.506	11.883	-13.389	3.172	5.765	-8.937
Age 55-64	-3.208	14.276	-11.067	-2.015	8.966	-6.951
Age 65-74	-4.885	11.256	-6.371	-9.118	10.708	-1.590
Schooling (Yrs)	-0.733	-0.129	0.862	-1.071	0.038	1.033
Log unearned income per mth	0.088	-0.137	0.049	-0.074	0.058	0.017
Log wage rate	8.331	-1.218	-7.113	5.330	0.691	-6.022
Unemployed	-27.859	13.474	14.385	-28.240	7.405	20.835
Inactive	-25.006	7.692	17.315	-27.117	4.013	23.104
Hebei	3.163	0.583	-3.746	2.938	0.573	-3.511
Heilongjiang	5.589	1.068	-6.657	5.650	-0.484	-5.116
Zhejiang	3.718	-2.123	-1.595	1.357	-1.331	-0.026
Anhui	2.111	2.403	-4.514	3.569	0.961	-4.530
Henan	2.928	-0.083	-2.846	2.431	0.379	-2.811
Guangdong	3.316	-1.327	-1.989	-0.932	-0.994	1.926
Sichuan	12.873	-3.582	-9.256	6.022	-0.578	-5.447
Yunnan	11.262	-4.297	-6.966	6.116	1.020	-7.138
Gansu	5.934	-0.491	-5.443	2.136	2.423	-4.559
R-squared	0.368	0.220	0.382	0.409	0.133	0.394
N	18,927			18,215		

[10] This table was generated by Dong and An (2008).

Appendix 3: Decomposition Results

Table A3: Decomposition results for the difference between Chinese female and Chinese male

	Paid work		Unpaid work		Non-work	
	Explained	Unexplained	Explained	Unexplained	Explained	Unexplained
Constant	0.000	-13.501	0.000	8.156	0.000	5.345
Urban	-0.132	2.447	0.014	-1.093	0.118	-1.354
Have Spouse	-0.006	-4.902	0.027	6.762	-0.021	-1.860
Has child 0-6	-0.059	-1.029	0.102	1.415	-0.043	-0.385
Household Size	-0.014	-0.228	0.037	1.454	-0.022	-1.231
Age 25-34	0.120	-0.191	0.208	0.634	-0.328	-0.443
Age 35-44	0.089	-0.058	0.188	1.244	-0.276	-1.185
Age 45-54	-0.001	-0.414	-0.008	1.521	0.009	-1.107
Age 55-64	0.062	-0.204	-0.275	0.906	0.213	-0.703
Age 65-74	0.066	0.292	0.928	0.038	-0.525	-0.330
Schooling (Yrs)	0.757	3.545	0.133	-1.751	-0.890	-1.793
Log unearned income per mth	0.042	1.205	-0.066	-1.450	0.024	0.238
Log hourly wage	-0.894	6.734	0.131	-4.284	0.764	-2.448
Unemployed	-0.195	0.009	0.094	0.140	0.101	-0.148
Inactive	-2.726	0.388	0.838	0.677	1.887	-1.065
Hebei	-0.009	0.029	-0.002	0.001	0.011	-0.031
Heilongjiang	0.000	-0.006	0.000	0.155	0.000	-0.154
Zhejiang	-0.019	0.215	0.011	-0.072	0.008	-0.143
Anhui	0.008	-0.176	0.010	0.174	-0.018	0.002
Henan	0.012	0.066	0.000	-0.061	-0.011	-0.005
Guangdong	-0.003	0.378	0.001	-0.030	0.002	-0.348
Sichuan	0.026	0.329	-0.007	-0.144	-0.019	-0.183
Yunnan	0.000	0.473	0.000	-0.489	0.000	0.016
Gansu	-0.006	0.361	0.000	-0.277	0.005	-0.084
Subtotal	-2.883	-4.238	2.363	13.626	0.989	-9.400
Total Gaps	-7.121		15.989		-8.411	
% explained	40%		15%		-12%	

Table A4: Decomposition results for the difference between Chinese female and Canadian female

| | Paid work | | Unpaid work | | Non-work | |
	Explained	Unexplained	Explained	Unexplained	Explained	Unexplained
Constant	0.000	-5.683	0.000	10.747	0.000	-5.065
Urban	2.094	-7.124	-0.221	1.644	-1.874	5.481
Have Spouse	-0.562	-0.837	2.672	2.550	-2.110	-1.713
Has child 0-6	-0.579	-0.898	0.996	-0.591	-0.417	1.489
Household Size	0.030	2.147	-0.077	-8.679	0.047	6.530
Age 25-34	0.091	0.974	0.159	-0.581	-0.250	-0.394
Age 35-44	0.538	0.988	1.137	-1.174	-1.675	0.186
Age 45-54	0.060	0.596	0.475	-1.208	-0.535	0.612
Age 55-64	0.168	0.154	-0.747	-0.699	0.579	0.545
Age 65-74	0.319	0.219	0.346	-0.492	-0.196	0.273
Schooling (Yrs)	3.189	-13.588	0.561	-4.617	-3.750	18.205
Log unearned income per mth	0.466	0.054	-0.726	0.135	0.260	-0.189
Log hourly wage	-14.930	35.552	2.183	-2.403	12.747	-33.149
Unemployed	-0.376	0.031	0.182	0.036	0.194	-0.067
Inactive	5.452	4.040	-1.677	-2.735	-3.775	-1.305
Subtotal	-4.040	16.626	5.264	-8.067	-0.756	-8.561
Total Gaps	12.587		-2.803		-9.316	
% explained	-32%		-188%		8%	

Table A5: Decomposition results for the difference between Chinese male and Canadian male

	Paid work		Unpaid work		Non-work	
	Explained	Unexplained	Explained	Unexplained	Explained	Unexplained
Constant	0.000	11.963	0.000	5.342	0.000	-17.306
Urban	3.003	-7.986	-0.657	3.223	-2.347	4.764
Have Spouse	0.775	1.636	0.213	-0.753	-0.988	-0.883
Has child 0-6	-0.122	0.181	0.380	-0.755	-0.259	0.575
Household Size	0.013	-0.815	-0.046	-5.101	0.032	5.919
Age 25-34	0.084	0.441	0.058	-0.914	-0.142	0.473
Age 35-44	0.503	-0.082	0.565	-1.437	-1.068	1.519
Age 45-54	0.133	0.071	0.242	-1.821	-0.375	1.750
Age 55-64	0.079	-0.094	-0.354	-1.439	0.274	1.533
Age 65-74	0.595	-0.405	-0.699	-0.657	0.104	1.061
Schooling (Yrs)	3.505	-17.722	-0.124	-3.871	-3.381	21.592
Log unearned income per mth	-0.321	-0.116	0.251	0.224	0.074	-0.105
Log hourly wage	-9.012	17.510	-1.168	2.756	10.182	-20.269
Unemployed	0.266	0.075	-0.070	-0.010	-0.196	-0.065
Inactive	5.418	3.975	-0.802	-2.169	-4.616	-1.806
Subtotal	4.921	8.632	-2.210	-7.383	-2.705	-1.248
Total Gaps	13.553		-9.592		-3.953	
% explained	36%		23%		68%	

Table A6: Decomposition results for the difference between gender gap in China and in Canada

	Paid work		Unpaid work		Non-work	
	Explained	Unexplained	Explained	Unexplained	Explained	Unexplained
Constant	0.000	0.000	0.000	0.000	0.000	0.000
Urban	0.088	-0.313	-0.020	0.472	-0.068	-0.158
Have Spouse	-0.145	-0.805	0.440	1.149	-0.296	-0.344
Has child 0-6	0.046	-0.900	0.031	0.225	-0.077	0.674
Household Size	0.059	0.041	-0.238	-0.054	0.179	0.012
Age 25-34	0.032	0.041	-0.019	0.041	-0.013	-0.083
Age 35-44	0.064	0.593	-0.076	0.176	0.012	-0.769
Age 45-54	-0.006	0.106	0.012	0.126	-0.006	-0.232
Age 55-64	-0.010	-0.047	0.044	-0.135	-0.034	0.182
Age 65-74	0.000	-0.315	-0.392	-0.053	0.217	0.368
Schooling (Yrs)	1.061	-0.994	0.361	0.174	-1.422	0.820
Log unearned income per mth	0.020	0.251	0.050	-0.090	-0.070	-0.165
Log hourly wage	-0.917	-7.776	0.062	2.218	0.855	5.556
Unemployed	0.043	0.004	0.050	-0.024	-0.093	0.020
Inactive	-0.144	0.489	0.097	-0.060	0.047	-0.430
Subtotal	0.192	-9.625	0.402	4.167	-0.768	5.452
Total Gaps	-9.433		4.569		4.684	
% explained	-2%		9%		-16%	

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