THE EFFECT OF UNIVERSAL CHILD BENEFIT ON FEMALE LABOR SUPPLY: CASE OF MONGOLIA

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ABSTRACT

This study investigates the causal impact of universal child benefit program of Mongolia on female labor force participation and worked hours of women with children using Propensity Score Matching with Difference-In-Differences approach. Child benefit program of Mongolia, which we focused on this study, is a unique case of the developing countries that implementing universal cash transfer programs. Our estimation strategy compares the labor force participation of women with children before and after the child benefit program. We use cross-sectional data from the Integrated Household Income and Expenditure Survey with Living Standards Measurement Survey of 2002/2003 and Household Socio-Economic Survey of 2007/2008 from the NSO of Mongolia. We find that between 2002/2003 and 2007/2008, women with children decreased their relative labor force participation by 12.27 percentage points. The estimated adverse effects of child benefit program on labor force participation are proved by linear regression of annual hours of worked. When we estimate the effects of universal child benefit on worked hours conditional on hours exceeding zero, women with children decreased their relative annual working hours conditional on working by 155.32 hours.

Index Terms: Universal Child Benefit, Female Labor Supply, Female Labor Force Participation, Difference-In-Differences Approach, Propensity Score Matching

INTRODUCTION

Child benefit program (sometimes called family allowance) is one of the important tools of social protection and poverty reduction strategies. Governments of many countries (e.g. OECD countries, most of EU countries) offer a cash benefit to families with children. In most cases, cash benefits have targeted at low-income families and provide families with children based on the family net income, and presence, number, age, and sometimes the birth order of child. Cash benefits can be unconditional, conditional on child's school enrollment, immunization, and nutrition, or else conditional to the parental work requirement. The primary goals of these programs typically include encouraging fertility, improving the wellbeing and long-term opportunities for children, and reducing poverty. However, it is hard to evaluate the policies achieve their goals and whether there are any potential side effects. Especially, consequences regarding labor market outcomes have been mostly ignored.

The child benefit program of Mongolia, which we focused on this study, is a universal cash benefit paid to a child under the age of 18, regardless of family income. There is no requirement that certain amount must be spent on particular services or goods. The stated original goals of the program were to reduce poverty, increase children's education, health, and nutrition, and redistribute mining revenues to Mongolian families living below the poverty line. In January 2005, the Mongolian government introduced the conditional child benefit (CCB) and expanded it into universal child benefit (UCB) in July 2006.

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We use the Difference-In-Differences (DD) model with Propensity Score Matching (PSM) method, to ensure that we are estimating the actual effect of UCBP on female labor force participation (FLFP). The PSM methods are commonly used to balance treatment and control groups on a set of baseline characteristics to make the groups as similar as possible with those observed baseline characteristics (first introduced by Rosenbaum and Rubin, 1983). The PSM will reduce imbalance, inefficiency, model dependence, and bias.

In this study, matching is about combining a woman with children (treatment group) and a woman without children (control group) with equal characteristics.

We have econometrically examined the impact of the UCBP on female labor supply and built a simple econometric model for estimation. We use probit and OLS linear regression model to estimate the effect of UCBP on the labor force participation and the worked hours.

An Overview of the Child Benefit Program in Mongolia

In the early 2000s, the Mongolian government approved contracts for the mining projects and began to receive increased revenues from early exploratory mining projects. As a result, Mongolian economy recovered, and GDP growth increased from 1% to 7% between 2000 and 2003. In 2003, the government announced the government's interest in conditional social development programs and constituted a framework for the creation of the Conditional Child Benefit Program (CCBP) within the scope of the Social Security Sector Master Plan. In January 2005, the Mongolian government introduced the conditional child benefit (CCB) and expanded it into universal child benefit (UCB) in July 2006. UCB program covering all children under the age of 18, regardless of family income, number, age, and birth order of the child. In addition to the monthly allowance of MNT 3,000 (approximately USD 2.5), it provided a disposable transfer of MNT 100,000 (approximately USD 86) for a newborn child. Further, in January 2007, the UCB is increased by an additional quarterly payment of MNT 25,000 (approximately USD 21.4) each child. An average monthly benefit accounted approximately 20.4% of MSL in 2007. The UCBP has discontinued the use of targeting mechanisms such as living with parents, immunizations, school enrollment, but use a soft form of conditionality of school enrolment.

In 2003, the poverty headcount index was 36.1%, and it decreased to 35.2% in 2008. However, this decline of 0.9 percentage points has not the same in the rural and urban area. The poverty rate had increased dramatically in a rural area. During 2003 to 2008, there was economic growth which averaged about 9%, but inequality had risen from 32.9 to 35.8. After the UCBP which started in July 2006, school enrollment rates and some health indicators of children are deteriorated.

In 2006, the UCBP costs equal to 2.6% of total government spending, or 1% of GDP. In 2007, the budget included a substantial increase in the benefit level, adding new quarterly payments of MNT 25,000 (approximately USD 21.4) per child. As a result, an annual child benefit had risen from MNT 36,000 (approximately USD 31) to MNT 136,000 (approximately USD 116.3), and the overall cost of the program represent about 9.5% of government expenditure or 3.9% of GDP. It means an enormous amount of money is spent on child benefit.

From another perspective, the cash transfer program was one of the political commitments that to win the election. Before the political elections of 2004 and 2008, the cash transfer program has expanded and adopted. Moreover, political considerations aside, the UCBP was also an attempt to avoid the resource curse that has affected other resource-rich developing countries. Ying Yeung and Stephen Howes (2015) reported that Mongolia is the only one developing country that has introduced a resources-to-cash scheme.

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THEORETICAL BACKGROUND AND LITERATURE REVIEW

Theoretical Background

According to the household production model, having children may negatively affect the labor force participation of mother. In contrast, having children may increase a probability of participation because of bringing up children may lead to an additional income requirement.

According to the simple standard static model of labor supply, non-labor income such as child benefit shifts the budget constraint. Then individual has a pure income effect which means that individual receiving the benefit are expected to purchase more normal goods. If leisure is a normal good, individuals to purchase more leisure (to reduce their hours of work) when receiving the benefits.

To analyze the behavior of labor force participation, economists often use the concept of reservation wage, which is defined as the wage rate at which an individual would be indifferent between participating and not participating in the labor force. The decision to participate in the labor market thus depends on the reservation wage. An increase in non-labor income such as child benefit increases the reservation wage and thus lead an individual's refuse to participate in the labor market.

Literature Review

Here we report some literature about child related benefit and female labor supply.

1. The effect of child care costs on female labor supply: There is a large study that effect of child care costs on labor market outcome of married women (David C. Ribar 1992; David M. Blau and Philip K. Robins 1988; Charles Michalopoulos and Philip K. Robins 1992; Rachel Connely 1992). They suggest that a reduction of the cost of market child care will have a strong positive effect on the labor supply of married women. Furthermore, both the decision to become employed and the decision to purchase market child care are sensitive to childcare costs.
2. The effect of child care subsidy on female labor supply: Mark C. Berger and Dan A. Black (1992), who report that mother's employment increases 25 percentage points as a result of the average weekly subsidy of USD 46. Moreover, Marcia K. Meyers, Theresa Heintze, and Douglas A. Wolf (2002) also found a positive relationship between childcare subsidies and employment.
3. The effect of child cash benefit (sometimes named family allowance) on female labor supply: There are few empirical studies on the relationship between universal child benefit and female labor supply. Nada Eissa and Jeffery B. Liebman (1996) have examined the labor supply response to the earned income tax credit. They conclude that after the Tax Reform Act, single women with children increased their relative labor force participation by up to 2.8 percentage points. Alexis Leon (2003) find that statistically insignificant negative effect of family allowance on female labor force participation using British Household Panel Data. Ghazala Naz (2003) evaluates the impact of Norwegian family policy reform and find that negative effect of reform on women's labor force participation. Highly educated mothers decreased more than that of less educated mothers. Robert McNown and Cristobal Ridao-Cano (2004) studied the effects of Canadian child benefit policies on fertility and female labor supply. They highlighted that child benefit policies are expected to have positive effects on fertility, with reverse effect on female labor supply. More recently, Tammy Schirly (2014) studied the universal child-related income transfer on the labor supply of married individuals. She concludes that the Canadian

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Universal Child Benefit has significant negative effects on labor supply. Lower-educated mothers reduced their labor force participation 3.2 percentage points when receiving the benefit.

Estimation Strategy and Data

Estimation Strategy

In this study, we present two major hypotheses based on the situation that described in the previous statement.

Hypothesis 1. The UCBP to be a negative impact on labor supply of women with children. Theoretically, non-labor income shifts the budget constraint. Then individual has a pure income effect which means that individual receiving the benefit are expected to purchase more normal goods. If leisure is a normal good, individuals to purchase more leisure (to reduce their hours of work) when receiving the benefits. Moreover, an increase in non-labor income such as child benefit increases the reservation wage and thus lead an individual's refuse to participate in the labor market.

Hypothesis 2. The UCBP has a greater impact on the labor force participation of woman with children who lives in a low-income household than those women with children who lives in a high-income household.

The UCBP is not targeting the low-income household. Since the benefit amount is same for all income group, the share of benefits on household income is higher for the low-income group than the high-income group. Therefore, its impact on participation will be higher for the low-income group.

Our estimation strategy compares the labor force participation (and worked hours) of women with children before and after the UCBP. We use all women with children as our treatment group and all women without children as the control group. The difference between the change in labor force participation of women with children and the change in labor force participation of women without children is our estimate of the effect of UCBP on participation. That is essentially the DD approach, and it will control for any concurrent shocks to the participation of women with children through the change in participation in the control group.

The probit model is used to estimate the effect of UCBP on labor force participation, and the OLS linear regression model is used to estimate the effect of UCBP on worked hours.

We use the following probit equation for labor force participation:

$$P(lfp_{it} = 1) = \Phi(\alpha + \beta Z_{it} + \gamma_o Child_i + \gamma_1 Post_t + \gamma_2 (Child * Post)_{it}) \quad (1)$$

where *lfp* is a dummy equal to one if a woman who has worked during the last 12 months or looking for a job last 3 months, zero otherwise. The vector Z_{it} represents the baseline set of controls we used. In our baseline specification, Z_{it} includes age, age squared, marital status, household size, household assets, asset squared, household income, the number of children, the number of preschool children, Agriculture dummy, and Bachelor dummy variable, etc. Z_{it} also includes regional dummy variables. $Child_i$ is a dummy equal to one for a woman who has a child under the age of 18, zero otherwise. We expect γ_0 to be positive, which means women with children have higher participation rates than those women without children. Because bringing up children may lead to an additional income requirement. $Post_t$ is a dummy equal to one for after the UCBP, zero otherwise. γ_1 measures the average

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changes in labor force participation for both women with children and without children between 2003 and 2008. Our key coefficient is γ_2 (coefficient on the interaction Child*Post). We expect γ_2 to be negative, which means that UCBP reduces the labor force participation of women with children.

Our OLS regression for worked hours is as follows:

$$Hours_{it} = \alpha + \beta Z_{it} + \gamma_o child_i + \gamma_1 Post_t + \gamma_2 (Child * Post)_{it} + e_{it} \quad (2)$$

where $Hours_{it}$ is total worked hours of a woman during the last 12 months.

Data

We use cross-sectional data from Integrated Household Income and Expenditure Survey with Living Standards Measurement Survey (HIES with LSMS) of 2002/2003 and Household Socio-Economic Survey (HSES) of 2007/2008 of the NSO of Mongolia.

The NSO of Mongolia has been conducted the HIES since 1966. It merged the LSMS in July 2007 under the name of HSES and had been conducting this HSES since then. The first LSMS was carried out in 1995 with technical and financial support from the World Bank (WB) and the second LSMS followed in 1998 with the support from United Nations Development Programme (UNDP). The integrated HIES with LSMS 2002/2003 that was one of the first biggest national survey carried out by an international methodology with technical and financial support from the WB and UNDP. The households of integrated HIES with LSMS 2002/2003 are a subset (equally distributed among the four quarters) of the household interviewed for the HIES 2002. That is why the survey referred as Integrated HIES with LSMS 2002/2003. The HIES 2002 interviewed 11,232 households which equally distributed in four quarter over the period of one year. One-third (3,308 households) of the HIES 2002 households was conducted again and interviewed on the LSMS topics.

The LSMS questionnaire has following sections: households' general information, household roster, housing, agriculture, livestock, non-farm enterprises, other sources of income, savings and loans, remittances, durable goods, and energy. The HIES collected monthly consumption information for each household.

The HSES 2007/2008 is an improved version of the HIES and was carried out between July 2007 and June 2008. It was the latest among other household surveys implemented by the NSO to evaluate the living standards of the Mongolian population such as the LSMS 1995, and 1998; and the HIES/LSMS 2002/2003. The NSO developed the sampling frame of the HSES based on population figures for 2005 from local registration offices, and it interviewed 11,172 households. The HSES has collected data through the following modules: basic socio-economic information, education, health, migration, employment, wage, job search, agriculture and herding, non-farm family business, income, savings and loans, housing and energy, durable goods, nonfood expenditures and food consumption.

Our sample includes females who are between 20 and 54 years old. We exclude any female who was disabled, or in school full time during the last 12 months. We also exclude a woman with child (under the age of 18) who did not get child benefits during the last 12 months. The resulting sample size is 12,851 observations.

EMPIRICAL RESULTS

Table 1 presents summary statistics of the characteristics of treatment and control groups. Column (1) and (3) of Table 1 shows the mean of the characteristics of women without children (control) and women with children (treatment) respectively. The results imply that the mean value of labor force participation of women with children is lower than the mean

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value of labor force participation of women without children (44 percent versus 50 percent). However, women with children also have other observable characteristics that can explain lower participation. They are less educated (12 percent versus 18 percent has a bachelor degree), most of them married (79 percent versus 39 percent), tend to be live in a rural area (56 percent versus 65 percent lives in Urban areas). Also, average earnings, household other income, and assets for women with children are less than women without children. In addition, 47 percent of women have a preschool-age child. The average number of children up to 18 years old are two.

From Table 1, we can conclude that there are some differences between treatment and control groups in demographic characteristics. The observed differences in labor force participation may reflect underlying differences between the treatment and control groups rather than a treatment effect. The DD approach will control for demographic differences in our analysis.

Table 1. Summary Statistics

	Control group Without children (Obs=3625)		*Treatment group* With children (Obs=9226)	
Variable	Mean	Std. Dev.	Mean	Std. Dev.
	(1)	(2)	(3)	(4)
Labor force participation	0.50	0.50	0.44	0.50
Annual hours of worked (Hours>0)	2200.0	868.6	2180.7	814.7
Age	35.62	12.12	35.63	7.88
HH size	4.37	2.11	4.78	1.69
Earned Income	677	1134	580	1031
Other Income	3306.8	8312.9	3008.9	15700.0
Total assets	12300.0	25600.0	9398.26	15600.0
Married*	0.39	0.49	0.79	0.41
Bachelor*	0.18	0.39	0.12	0.33
Preschool children*	-	-	0.47	0.50
Number of children	-	-	2.00	1.05
Urban area*	0.65	0.48	0.56	0.50

Note: 1) * denotes a dummy variable 2) Labor force participation equal to one if a woman who has worked (not include work on an own account, in the household farm, and herd) during the last 12 months or looking for a job last 3 months, zero otherwise.

We estimate the effect of UCBP on FLFP using DD probit model. We use the PSM method with our probit regression, to ensure that we are estimating the actual effect of UCBP on FLFP. The PSM method will reduce the imbalance in covariates between treated and control groups. We use one-to-one, nearest-neighbor propensity score matching to find the control individual with the propensity score closest in value to the treatment individual. After the matching, we discard 5,601 treated observations and the resulting sample size is 7250 observations.

Each column of Table 2 presents the separate probit results. Column (1) reports the result of DD model and column (2) the results of matched DD model. In Table 2, expected participation response was negative and statistically significant at the 1% level. The Married dummy, Agriculture dummy, the interaction between Child and Post variable, log(Income), the number of children, the number of preschool children, and Unemployment rate variables are negative; the Bachelor dummy, Age, log(Asset), household size, Child dummy, and Post dummy variables positively correlated with labor force participation. There is a coefficient of

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Child (γ_0) is positive. It means that woman with children has tended to be higher probabilities of participation than the participation of those women without children. Also, γ_1 is positive which suggesting that there is an overall positive trend in average participation in the two groups. The key coefficient γ_2 is a negative sign and the other coefficients on the demographic characteristics, and regional variables are all economically (all have expected signs) and statistically significant.

Table 2. DD Probit Results: The Effects of UCBP on FLFP

	DD	Matched DD
Estimate coefficients		
Child (γ_0)	0.330***	0.321***
Post (γ_1)	0.341***	0.350***
Child*Post (γ_2)	-0.367***	-0.393***
Age	0.145***	0.128***
Age_sq	-0.002***	-0.002***
Married	-0.191***	-0.191***
Bachelor	0.674***	0.588***
Hhsize	0.080***	0.072***
Hhsize_ sq	-0.006***	-0.006***
Children_pre	-0.155***	-0.211***
Children	-0.066***	-0.03
Log_Income	-0.032***	-0.035***
Log_Asset	0.164	0.11
Log_Asset_ sq	-0.006*	0.00
Agriculture	-0.428***	-0.385***
Unemployment	-0.046***	-0.042**
Log Likelihood	-7277.81	-4194.87
Observations	12851	7250
Predicted participation response (γ_2)	-0.1165***	-0.1288***

Note: 1) The dependent variable is labor force participation. Labor force participation equal to one for a woman who has worked (not include work on an own account, on the household farm, and herd) during the last 12 months or looking for a job last 3 months, zero otherwise. 2) *, **, and *** indicate significance at 10%, 5% and 1% level, respectively. 3) The estimated coefficients on Region dummy variables are not reported.

The probit is a nonlinear model. Therefore, the coefficients cannot be used directly as marginal effects. Also, in a nonlinear model, the cross difference does not represent the treatment effect. Patrick A. Puhani (2008) shows that, in a nonlinear "difference-in-differences" model, the treatment effect is the cross difference of the conditional expectation of the observed outcome minus the cross difference of the conditional expectation of the potential outcome without treatment. Estimated average participation responses of women with children are reported in the last row of Table 2. Since PSM reduces the imbalance in covariates between the treated and control groups, we will explain the results of matched DD model. When we add all variables in our probit model, we find that women with children decreased their relative labor force participation by statistically significant 12.88 percentage points.

In order to check the Hypothesis 2, we use income interaction variables in our probit model. We estimate the following Difference-In-Difference-In-Differences (DDD) regression model:

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$$(lfp_{it} = 1) = \Phi(\alpha + \beta Z_{it} + \gamma_o Child_i + \gamma_1 Post_t + \gamma_2 (Child * Post)_{it} + \gamma_3 LowInc_i + \gamma_4 (LowInc * Child)_i + \gamma_5 (LowInc * Post)_{it} + \gamma_6 (LowInc * Child * Post)_{it}) \quad (3)$$

where *LowInc* is a dummy equal to one for a woman who lives under the MSL, zero otherwise. If γ_6 is negative, it indicates that the UCBP has had more impact on the low-income group. We expect γ_6 to be negative. The results are reported in Table 3. The DDD and Matched DDD results are much similar again. The coefficient of γ_6 has negative, however, it has statistically insignificant. In other words, we have not found any significant results for whether the UCBP has more impact on the low-income group.

Table 3. DDD Probit Results: The Effects of UCBP on FLFP

	DDD	Matched DDD
Estimated coefficients		
Child (γ_0)	0.297***	0.276***
Post (γ_1)	0.333***	0.297***
Child*Post (γ_2)	-0.341***	-0.358***
LowInc (γ_3)	-0.282**	-0.290***
LowInc* Post (γ_4)	0.063	0.083
LowInc*Child (γ_5)	-0.026	-0.078
LowInc*Child* Post (γ_6)	-0.061	-0.072
Age	0.142***	0.125***
Age_sq	-0.002***	-0.002***
Married	-0.207***	-0.203***
Bachelor	0.658***	0.564***
Hhsize	0.102***	0.092***
Hhsize_sq	-0.007***	-0.006***
Children_pre	-0.153***	-0.213***
Children	-0.056***	-0.019
Log_Income	-0.033***	-0.036***
Log_Asset	0.109	-0.124
Log_Asset_ sq	-0.005	0.004
Agriculture	-0.420***	-0.375***
Unemployment	-0.038***	-0.032
Log Likelihood	-7236.85	-4168.31
Observations	12851	7250
Predicted participation response (γ_2)	-0.1123***	-0.1227***

Note: 1) The dependent variable is labor force participation. Labor force participation equal to one for a woman who has worked (not include work on an own account, on the household farm, and herd) during the last 12 months or looking for a job last 3 months, zero otherwise. 2) *, **, and *** indicate significance at 10%, 5% and 1% level, respectively. 3) The estimated coefficients on Region dummy variables are not reported.

Theoretically, an individual has a pure income effect when receiving the benefits. It means that individual receiving the benefit are expected to purchase more goods that are normal. If the leisure is a normal good, individuals to purchase more leisure (reduce their hours of work) when receiving the benefits. Our next estimate is the effect of UCBP on worked hours.

When we estimate the effects of UCBP on annual worked hours conditional on hours exceeding zero, women with children decreased their relative working hours conditional on working by 155.32 hours (for the full sample 157.51 hours). That result reported in Table 4.

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The coefficient estimate of γ_6 is again statistically insignificant. It means that there is no significant difference in the response of worked hours between low and high-income groups. Altogether the UCBP has negative effects on the annual working hours of women with children.

Table 4. DDD OLS Results: The Effects of UCBP on Annual Worked Hours, Hours>0

	DDD	Matched DDD
Estimated coefficients		
Child (γ_0)	163.81**	160.73*
Post (γ_1)	-29.11	-42.92
Child*Post (γ_2)	-157.51**	-155.32*
LowInc (γ_3)	291.64**	276.09**
LowInc* Post (γ_4)	-364.34**	-347.94**
LowInc*Child (γ_5)	-341.02**	-393.41**
LowInc*Child* Post (γ_6)	317.2	327.82
Age	48.92***	42.65***
Age_sq	-0.63***	-0.56***
Married	-23.87	-19.67
Bachelor	-141.17***	-152.56***
Hhsize	28.61	16.53
Hhsize_sq	-1.37	-0.63
Children_pre	-87.09***	-176.62***
Children	-26.98	12.93
Log_Income	-6.57***	-3.22
Log_Asset	-94.6	-286.15
Log_Asset_ sq	2.37	8.36
Agriculture	87.23***	56.07
Unemployment	-0.86	5.11
Observations	5009	2947

Note: 1) The dependent variable is annual hours of worked. 2) *, **, and *** indicate significance at 10%, 5% and 1% level, respectively. 3) The estimated coefficients on Region dummy variables are not reported.

CONCLUSION

In this study, researchers examine the effect of UCBP on the labor supply of women with children. We use cross-sectional data from Integrated HIES with LSMS of 2002/2003 and HSES of 2007/2008 from the NSO of Mongolia. In order to examine the effects of UCBP on female labor supply, we use DDD approach with PSM.

Researchers use all women with children as our treatment group and all women without children as the control group. This study will be an important alternative evidence that examined the impact of universal child benefits on female labor supply because UCBP of Mongolia is not targeting the low-income households. It provides the same amount of benefits for each child under the age of 18, regardless of family income, and birth order or age of the child. Moreover, there is no requirement that certain amount must be spent on particular services or goods. If the household spends their child benefits to child-related goods and services, it will produce a little distortion of work incentives.

It was found that after the UCBP, women with children decreased their relative labor force participation by 12.27 percentage points.

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When researchers estimate the effects of UCBP on worked hours conditional on hours exceeding zero, women with children decreased their relative working hours conditional on working by 155.32 hours. Our findings are suggesting that the UCBP reduces the labor force participation and working hours of women with children.

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ISSN: 2186-8492, ISSN: 2186-8484 Print
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