



DEMOGRAPHIC RESEARCH

A peer-reviewed, open-access journal of population sciences

DEMOGRAPHIC RESEARCH

VOLUME 51, ARTICLE 21, PAGES 669–686

PUBLISHED 18 SEPTEMBER 2024

<https://www.demographic-research.org/Volumes/Vol51/21/>

DOI: 10.4054/DemRes.2024.51.21

Descriptive Finding

**Childlessness in Korea: Role of education,
marriage postponement, and marital
childlessness**

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Childlessness in Korea: Role of education, marriage postponement, and marital childlessness

Misun Lee¹
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Abstract

BACKGROUND

In Korea, where marriage and childbirth are inextricably linked, the number of childless women is rising. Aside from the increase in permanent unmarried women, the prevalence of late marriage limits a woman's reproductive period, raises the risk of infertility, and can lead to childlessness. As Korea experienced the universalisation of higher education, the prolongation of education may have affected the timing of marriage.

OBJECTIVE

Examining women's marital status, age at first marriage, and educational background, this research explores how increasing age at marriage and extending educational periods are related and how they affect childlessness.

METHODS

Based on 2005 and 2020 Korean census data, this study examines unmarried and married women aged 40. Descriptive statistics describe the trend of childlessness, and the effects of marital status, age at marriage, and educational background on childlessness are analysed by the decomposition technique.

RESULTS

The number of Korean women who postpone and forgo marriage and childbirth is rising across all educational levels. Women with lower education marry earlier but are more likely to remain childless. Among recent birth cohorts, women tend to stay childless/child-free longer after marriage, regardless of education. More of them ultimately remain childless.

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CONCLUSION

An increase in permanently unmarried women, delayed childbirth after marriage, and marital childlessness has resulted in a significant rise in childlessness regardless of the education of women.

CONTRIBUTION

There is literature on low fertility, childlessness, and delayed marriage, but the effect of education and marriage timing on marital childlessness remains understudied.

1. Introduction

Childlessness is on the rise in many low-birth-rate countries (Beaujouan, Zeman, and Nathan 2023; Gemmill 2019; Sobotka 2017), and the Republic of Korea (hereafter Korea) is one of them (Sobotka 2021). In the past, childbearing after marriage was regarded as a natural family formation consequence, but that has changed. The proportion of marital childless couples aged 35 to 39 increased from 2.2% in 1990 to 8.6% in 2022 (KOSIS 1990, 2022a). Despite the Korean government's efforts to raise the fertility rate over the past 20 years, the number of childbirths continuously fell, and the number of women who avoided marriage and childbirth persistently escalated (Kim 2005; Kwon 2001; Lee 2009).

In Western societies, unmarried cohabitation and non-marital births have become common. The decline in marriage is not directly related to low fertility or childlessness (Lesthaeghe 2020). However, in Eastern societies, including Korea, family formation, such as childbearing and childrearing, has been carried out on the premise of marriage (Cheng 2020; Tan 2022; Yu and Xie 2021). Consequently, the decrease in marriage and increased ages at marriage significantly impact low fertility (Choe and Retherford 2009; Raymo et al. 2015) and childlessness (Hayford 2013; Rybińska and Morgan 2019). Among women born in 1973, the share of 40-year-old never-married women was about 7.1%, but for those born in 1983, it more than doubled to 19.3% (KOSIS 2023c). This sharp rise signals that Korean society has undergone profound changes in family formation related to marriage and childbirth.

At the same time, the expansion of women's higher education was considerable (Choe 2006; Yoo 2014). The rapid increase in women receiving higher education (i.e., tertiary education) began in the 1990s (Choi 2018). The proportion of women aged 25 to 29 who graduated from junior college or university soared from about 1.7% in 1980 to 70.5% in 2020 (KOSIS 1980, 2020). Since previous research has shown that women defer childbirth until the end of their education (Neels et al. 2017; Ní Bhrolcháin and Beaujouan 2012; Wood, Neels, and Kil 2014), the extended educational periods affect women's

delay in motherhood. Still, little is known about the effect of differences in the timing of marriage among women with different levels of education on ultimate childlessness in Korea.

Korean policymakers and scholars have focused on low fertility but less on childlessness (Cho, Lee, and Kim 2021; Park, Park, and Park 2019). In one of the few studies, Hwang (2023) examined the incidence of and changes in marriage and childbirth by using educational attainment to explain the cohort effect. It addressed a trend of late and decreased marriage, which leads to low fertility as well as childlessness. However, how and to what extent the timing of marriage influences childlessness was not discussed. This paper aims to fill this gap by analysing the relationship between age at marriage and educational attainment and how it affects childlessness. In other words, the purpose of this study is to uncover how childlessness has evolved and whether prolonged education affects the timing of marriage and childbirth. It employs two stages of methodological strategy: descriptive statistics and decomposition techniques. These methods can provide an overall look at childlessness and more detailed information about the relationship between childlessness, postponed marriage, and women's educational attainment.

2. Effects of educational differences on the transition from marriage to childbirth

Marriage and childbirth are fundamental life choices; childbirth is biologically time-limited, and the consequences of choices are irreversible (Morgan and Rindfuss 1999). Since modernisation has expanded women's opportunities for education and labour market participation, marriage and childbirth have been postponed and evaded by young generations in East Asia, including in Korea (Brinton and Oh 2019; Chen and Chen 2014; Liang and Yu 2022; Raymo et al. 2015; Raymo, Park, and Yu 2023).

Although Korean socioeconomic conditions have changed abruptly, the traditional view toward women's roles has not changed much. Even if married women have jobs, they face time constraints and high expectations of fulfilling their family roles as mothers, wives, and daughters (Anderson and Kohler 2015; Chun and Das Gupta 2022; Ma 2013; Oh 2018; Yoon 2016). Under these circumstances, avoiding and postponing marriage and childbirth seems rational. The average age of Korean women at first marriage increased from 24.9 in 1992 to 31.3 in 2022, and the age of mothers at first childbirth rose from 26.2 in 1993 to 32.9 in 2022 (KOSIS 2023b, 2023a).

Since a prolonged education implies postponed marriage and motherhood, highly educated women may be more prone to stay single or child-free. Explanations for the association between education and low fertility in Korea are varied and somewhat mixed. Hwang (2023) and Yoo (2014) write that fertility changes are more associated with the

cohort than the level of education. Choe and Retherford (2009) indicate that an increase in the proportion of women with high education implies severe competition in the labour market, which delays marriage and motherhood. On the other hand, Tan (2022) shows that educational differences are related to the transition to first birth, as better educated women are less likely to marry or have a birth after marriage than less educated women.

The outcome of expanded women's education on fertility may differ depending on the observed cohort or period. However, a more critical point, as Choi (2018) argues, is that educational expansion must be examined in the social and institutional contexts. In addition, a crucial limitation of existing studies is that most focus on transitioning from marriage to first childbirth. Only a handful of research has investigated the relationship between postponement of marriage and childlessness in Korea. This study aims to fill this gap by presenting empirical results on marital childlessness among women aged 40 (born in 1965 and 1980) according to age at first marriage and educational attainment. This research also examines the role of educational expansion in explaining childlessness across and within levels of education.

3. Data and methods

3.1 Data

This analysis is based on the Korean Population and Housing Census datasets in 2005 and 2020. Statistics Korea collects data every five years from all individuals residing in Korea, and a questionnaire is distributed to each selected household. The census sample sizes provided by Statistics Korea are $N = 6,800$ (2% sample) for the 2005 census (1965 cohort) and $N = 65,340$ (20% sample) for the 2020 census (1980 cohort). The analysed datasets are available online (KOSIS 2021, <https://mdis.kostat.go.kr/>), with access requiring the approval of Statistics Korea and with only strictly protected remote access to individual data.

The analysis consists of two stages. First, we use descriptive statistics to examine 40-year-old childless women (born in 1965 and 1980). Second, decomposition techniques are applied based on marital status, timing of marriage, and educational background. Marital status includes married women (based on first marriage, excluding those who are divorced, separated, or widowed) and never-married women. The reason for choosing age 40 is that it is sufficiently old enough to provide relevant information if marriage or childbirth occurred. Since birth out of wedlock is still rare in Korea – 2.9% in 2021 (KOSIS 2022b) – never-married women are considered childless. The level of education is measured by completed education according to the highest attained educational level:

- 1) Low education: high school graduates or lower (up to secondary education or the equivalent up to ISCED 3).
- 2) High education: graduates from junior college or university (bachelor's degree or the equivalent of ISCED 4–6) and post-graduates (master's or doctoral degree or equivalent of ISCED 7–8).

3.2 Decomposition

The decomposition consists of two steps. The first step focuses on the role of marriage postponement: To what degree does delayed marriage (the timing of marriage) affect the increase in childlessness and to what extent is it attributable to the rise in marital childlessness itself? The second step explores the role of increased women's education (educational expansion), examining whether substantial differences in marital behaviour and childbearing depend on educational levels and whether prolonged schooling contributes to childlessness.

Since childlessness combines two phenomena, singleness and marital childlessness, never-married women (considered childless) are added to the decomposition as an independent component. S refers to single women, M to married women. P is the total female population, and 0 denotes childless women. Age at marriage is marked as x , and classified in single years of age up to 40 (only women who married before 25 are added to the age group <25). Education is denoted as edu and classified as *LOW* or *HIGH*. All calculations are based on women aged 40 (in the birth cohorts 1965 and 1980), and the decompositions are performed based on changes between the 2005 and 2020 censuses.

3.2.1 Age at first marriage

Childlessness is decomposed into childlessness of never-married (singleness) and married women as follows:

$$\text{Childlessness} = \text{chl}^{\text{SINGLE}} + \text{chl}^{\text{MARRIED}} = \frac{P^0}{P} = \frac{S^0}{P} + \frac{M^0}{P} = \frac{S}{P} + \frac{M^0}{M} * \frac{M}{P} \quad (1)$$

The primary focus is to decompose marital childlessness using the age at marriage and marital childlessness rates into the part of marriage postponement (composition) and the role of increased marital childlessness itself (rate). Marital childlessness unfolds to the sum of distribution M_x/M and rate M_x^0/M_x by age at marriage x as:

$$\frac{M^0}{M} = \sum_x \frac{M(x)}{M} * \frac{M^0(x)}{M(x)} \quad (2)$$

The decomposition, adapting the method of Kitagawa (1955) as formalised by Das Gupta (1993: 19, formulae 3.1–3.9), is applied.

The rate effect:

$$\sum_x \left(\frac{M_{2020}(x)}{M_{2020}} + \frac{M_{2005}(x)}{M_{2005}} \right) / 2 * \left(\frac{M_{2020}^0(x)}{M_{2020}(x)} - \frac{M_{2005}^0(x)}{M_{2005}(x)} \right) \quad (3)$$

Composition effect (postponement):

$$\sum_x \left(\frac{M_{2020}(x)}{M_{2020}} - \frac{M_{2005}(x)}{M_{2005}} \right) * \left(\frac{M_{2020}^0(x)}{M_{2020}(x)} + \frac{M_{2005}^0(x)}{M_{2005}(x)} \right) / 2 \quad (4)$$

The results provide information on how much of the overall increase in childlessness is due to singleness, marital childlessness (rate effect), and delayed marriage (composition effect). The decomposition is then applied separately to women in the *LOW* and *HIGH* educational categories.

3.2.2 Education

The analysis examines the impact of improvements in women’s educational attainment (educational expansion). The changes in singleness and marital childlessness are decomposed into differences in educational composition and the rate itself. This decomposition does not include the effect of marital duration.

$$\text{childlessness} = \text{chl}^{\text{SINGLE}} + \text{chl}^{\text{MARRIED}} \quad (5)$$

$$\text{chl}^{\text{SINGLE}} = \frac{S}{P} = \sum_{\text{edu}} \frac{S(\text{edu})}{S} * \frac{S(\text{edu})}{P(\text{edu})} \quad (6)$$

$$\text{chl}^{\text{MARRIED}} = \frac{M^0}{P} = \sum_{\text{edu}} \frac{M^0(\text{edu})}{M^0} * \frac{M^0(\text{edu})}{P(\text{edu})} \quad (7)$$

The rate effect:

$$\Delta \text{chl}^{\text{S rate}} = \sum_{\text{edu}} \left(\frac{S_{2020}(\text{edu})}{S_{2020}} + \frac{S_{2005}(\text{edu})}{S_{2005}} \right) / 2 * \left(\frac{S_{2020}(\text{edu})}{P_{2020}(\text{edu})} - \frac{S_{2005}(\text{edu})}{P_{2005}(\text{edu})} \right) \quad (8)$$

$$\Delta \text{chl}^{M \text{ rate}} = \sum \text{edu} \left(\frac{M_{2020}(\text{edu})}{M_{2020}} + \frac{M_{2005}(\text{edu})}{M_{2005}} \right) / 2 * \left(\frac{M_{2020}^0(\text{edu})}{P_{2020}(\text{edu})} - \frac{M_{2005}^0(\text{edu})}{P_{2005}(\text{edu})} \right) \quad (9)$$

Composition effect (postponement):

$$\Delta \text{chl}^{S \text{ composition}} = \sum \text{edu} \left(\frac{S_{2020}(\text{edu})}{S_{2020}} - \frac{S_{2005}(\text{edu})}{S_{2005}} \right) * \left(\frac{S_{2020}(\text{edu})}{P_{2020}(\text{edu})} + \frac{S_{2005}(\text{edu})}{P_{2005}(\text{edu})} \right) / 2 \quad (10)$$

$$\Delta \text{chl}^{M \text{ composition}} = \sum \text{edu} \left(\frac{M_{2020}(\text{edu})}{M_{2020}} - \frac{M_{2005}(\text{edu})}{M_{2005}} \right) * \left(\frac{M_{2020}^0(\text{edu})}{P_{2020}(\text{edu})} + \frac{M_{2005}^0(\text{edu})}{P_{2005}(\text{edu})} \right) / 2 \quad (11)$$

4. Results

4.1 Descriptive statistics

Figure 1 shows the nuptiality by women’s age and education. Half of the Korean women were married before the age of 25 in 2005, whereas this rate is not observable until the age of 29 in 2020. By educational level, women with lower education married earlier than those with higher education. However, marital status is similar regardless of education at age 40, and the proportion of never-married women increased at all levels of education in the 1980 cohort compared to the 1965 cohort.

Figure 1: Proportion of never-married women by age and educational attainment, cohorts 1965 (left) and 1980 (right)

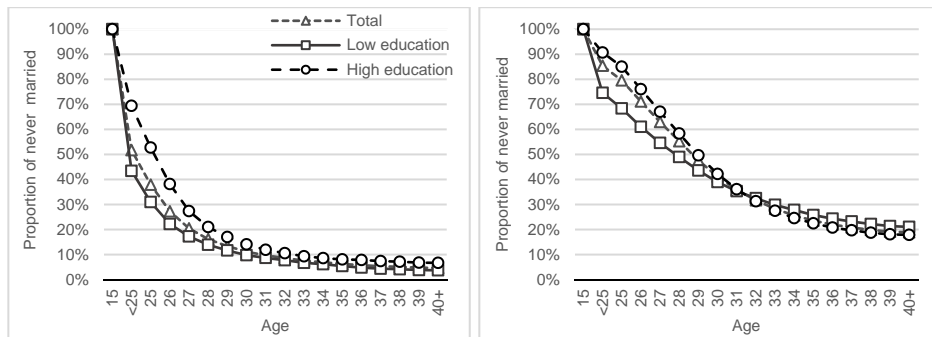
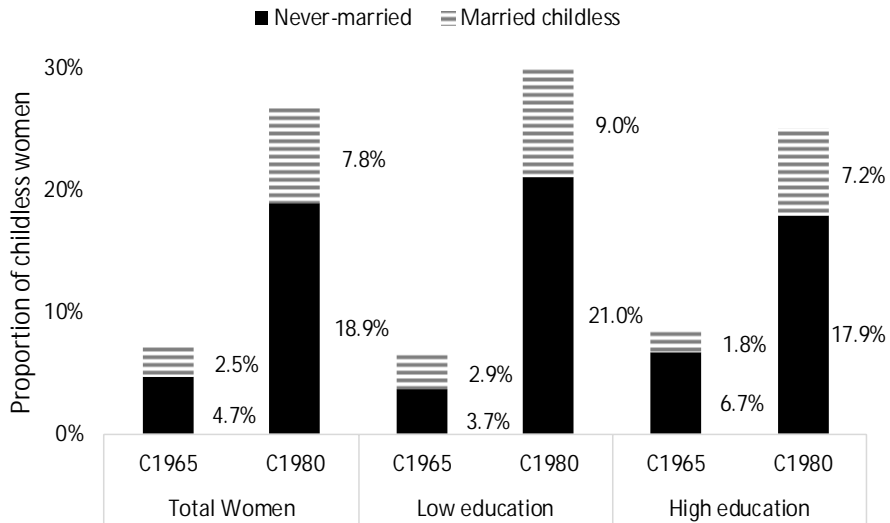


Figure 2 and Table 1 present women aged 40 by marital status and educational attainment in the two cohorts. The overall share of never-married and married childless women jumped from 7.2% to 26.7%. The overall increase between the two birth cohorts

is +19.5 percentage points (p.p.). The +14.2 p.p. increase is due to the higher proportion of never-married women, and the +5.2 p.p. growth is due to childlessness within marriage. The upward propensity for childlessness is observed among women across all educational levels. However, among the 1980 cohort, women with low education are more likely to be childless than are highly educated women.

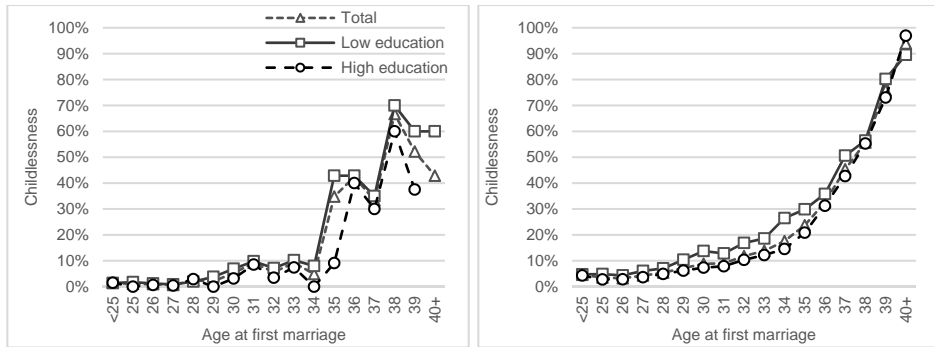
Figure 2: Childless women at age 40 by marital status and educational attainment, cohorts 1965 and 1980



The association between age at first marriage and childlessness by educational background among 40-year-old women is illustrated in Figure 3. Marital childlessness varies by marriage age, which means that the timing of marriage has different effects on childlessness. The share of childless married women before their 30s was only about 1.4% in 2005 but had increased to 4.7% by 2020. However, among women who married after age 35, an average of 45.4% reported childlessness in 2005 and 54.5% reported childlessness in 2020. In particular, the increase in marital childlessness among recent birth cohorts, regardless of marriage age, indicates that more women stay child-free/childless longer after marriage. Women with lower education are more likely to remain childless than women with higher education, and this pattern is examined in both cohorts, 1965 and 1980. These results suggest that even if the age at first marriage is the

same, women with low education are more likely to be childless than women with higher education.

Figure 3: Childlessness by age at first marriage and by educational attainment among 40-year-old married women in cohorts 1965 (left) and 1980 (right)



Note: Values for the 1965 cohort fluctuate due to low numbers (2% sample). The sample size of married, childless women at age 40 was 173 in the 2005 census and 5,074 in the 2020 census.

4.2 Decomposition results

The first part of the decomposition results is summarised in Table 1. As shown previously, the overall childlessness rate increased by +19.5 p.p. between the two birth cohorts. Most of this change in marital status is due to a sharp increase (+14.2 p.p.) in the number of never-married women. According to the decomposition model based on the age at first marriage (the timing of marriage), postponement of marriage (a composition effect of +2.8 p.p.) appears to have a slightly greater impact on the increase in childlessness among married women than on the increased marital childlessness itself (rate effect of +2.4 p.p.). The decomposition results for educational levels are similar for women with low and high levels of education. However, the overall increase is steeper for less educated women.

The outcomes of the decomposition of women’s higher education (educational expansion) into childlessness rates and educational components between the two birth cohorts are presented in Table 2. The composition effect (improvements in educational attainment) has no or minimal negative effects on childlessness. In contrast, the rate effect (increased childlessness itself) positively affects childlessness for both never-married and

married women. This outcome indicates that the rise in childlessness between the two cohorts is not due to the educational expansion, which confirms Hwang’s (2023) finding.

Table 1: Decomposition of changes in childlessness between cohort 1965 and cohort 1980 by marital status and educational attainment

	Cohort 1965 (in %)	Cohort 1980 (in %)	Change (in p.p.)
Never married (and childless)	4.7	18.9	+14.2
Married childless	2.5	7.8	+5.2
Total childless	7.2	26.7	+19.5
		due to increased singleness	+14.2
		due to increased marital childlessness (rate effect)	+2.4
		due to postponement of marriage (composition effect)	+2.8
Low education			
Never married (and childless)	3.7	21.0	+17.3
Married childless	2.9	9.0	+6.1
Total childless	6.6	30.0	+23.4
		due to increased singleness	+17.3
		due to increased marital childlessness (rate effect)	+3.0
		due to postponement of marriage (composition effect)	+3.1
High education			
Never married (and childless)	6.7	17.9	+11.2
Married childless	1.8	7.2	+5.4
Total childless	8.4	25.0	+16.6
		due to increased singleness	+11.2
		due to increased marital childlessness (rate effect)	+3.0
		due to postponement of marriage (composition effect)	+2.5

Table 2: Decomposition of changes in childlessness between cohort 1965 and cohort 1980 into changes in educational composition and changes in childlessness rates

	Cohort 1965 (in %)	Cohort 1980 (in %)	Change (in p.p.)	Composition effect (increase of education, in p.p.)	Rate effect (childlessness itself, in p.p.)
Never married	4.7	18.9	+14.2	0.0	+14.0
Married childless	2.5	7.8	+5.2	-0.6	+5.8
Total childless	7.2	26.7	+19.5	-0.6	+19.8

Note. Never-married women are regarded as childless.

5. Discussion and conclusion

This paper studies childlessness trends in Korea, where marriage and childbearing are firmly knotted and where nuptiality and fertility rates have continuously plummeted over the past two decades. Findings show that avoidance and postponement of childbirth have become more prevalent, mainly due to a sharp rise in the number of never-married women. In addition, delaying marriage, postponing childbirth within marriage, and increasing childlessness have contributed to the rise in marital childlessness. These results suggest changes in the relationship between marriage and childbirth as well as changes in the meaning of marriage for childbearing.

Childlessness trends are examined across all educational backgrounds. However, the younger cohort (1980) shows that never-married and married women with lower education are slightly more likely to be childless. Considering that the educational expansion led to a significant decline in the number of women with low education between the two cohorts, this may mean that the socioeconomic status of women in Korea with a low level of education has weakened. The level of education is associated with socioeconomic status (Kim and Kamo 2018; Yoon, Lim, and Kim 2022). Thus it may mirror the difficult position of women with low levels of education in the marriage and labour markets (Kim 2017; Park, Lee, and Jo 2013; Park and Choi 2015).

Our findings show that the improvement of women's educational attainment – namely, educational expansion – is not the primary driver of Korea's increase in childlessness. Rather, changes in marriage and childbearing behaviours between the two birth cohorts should be viewed as an intergenerational shift. The socioeconomic situations in Korean society differed for these two birth groups, especially when they received education and began forming families. However, educational expansion may have had an indirect effect between generations, such as changes in values related to family and the meaning of children. As the quality of general education improved, the number of women with only a primary education decreased to nearly nothing.

This research has limitations. Data limitations did not allow for examining more extended periods. Although out-of-wedlock births are rare in Korea, it was impossible to exclude such cases from the analysis altogether. The data were collected from women in their households. There is no data on Korean men's fertility or information on childbearing for couples outside of legitimate marriage. More in-depth family research requires data reflecting more diverse perspectives on family and couple relationships.

Despite these shortcomings, this paper provides an enhanced understanding of trends in marital childlessness based on educational differences and the timing of marriage. Korea has shown an unprecedentedly low fertility rate (below 1.0) since 2018. However, there is still only limited research on childlessness, especially marital childlessness. In addition to education, other socioeconomic factors may play a role in

determining when to marry and have children. In particular, the effectiveness of education may vary depending on women's socioeconomic conditions. Therefore more comprehensive research focusing on these extended factors is needed.

6. Acknowledgements

We thank Jungho Kim, Endale Kebede, and two anonymous reviewers for their constructive comments and suggestions.

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