



UNIVERSITY
of HAWAII®
MĀNOA

University of Hawai`i at Mānoa
Department of Economics
Working Paper Series

Saunders Hall 542, 2424 Maile Way,
Honolulu, HI 96822
Phone: (808) 956 -8496
www.economics.hawaii.edu

Working Paper No. 12-8

The Impact of State Children's Health Insurance
Program (SCHIP) Expansion on Health Insurance
Coverage in Hawaii

By

Gerard Russo, Jaclyn R.K. Lindo, Sang-Hyop Lee, Rui
Wang, Thamana Lekprichakul, and Abdul Jabbar

May 2012

The Impact of State Children's Health Insurance Program (SCHIP) Expansion on Health Insurance Coverage in Hawaii

Gerard Russo^a, Jaclyn R.K. Lindo^b, Sang-Hyop Lee^a, Rui Wang^c,
Thamana Lekprichakul^d, and Abdul Jabbar^e

^a *University of Hawai'i at Mānoa, Department of Economics, Honolulu, HI, USA*

^b *Hawaii Health Information Corporation, Honolulu, HI, USA*

^c *Liberty Mutual Insurance Company, Boston, MA, USA*

^d *Research Institute for Humanity and Nature, National Institutes for the Humanities,
Kyoto, Japan*

^e *School of Economics, International Islamic University, Islamabad, Pakistan*

This Version: April 2012

The paper is dedicated to the memory of Gerard Russo. Corresponding author: Jaclyn R.K. Lindo, Suite 1870 Makai Tower, 733 Bishop Street, Honolulu, HI 96813. jlindo@hhic.org. Tel: (808) 534-1281. Fax: (808) 534-0292. This research is funded in part through the United States Department of Health and Human Services (HHS), Health Resources and Services Administration (HRSA), State Planning Grant (SPG) Program with supplemental funding from the Robert Wood Johnson Foundation (RWJF). Hawaii State Department of Health, Prime Contract Nos. 1 P09 OA 00046-01-00, 2 P09 OA 00046-02-00, and P09 HS 00046-03-00. Sub-contracts to the Research Corporation of the University of Hawaii (RCUH), University of Hawaii, Social Science Research Institute (SSRI). RCUH Project Nos. 659075, 652584, 652583, 654250, 655422, and 437727. Office of Research Services (ORS) Award Nos. Z604415, Z664509, Z664512, Z711573, Z743869, and Z744892. We would like to thank the participants in numerous seminars and workshops for their helpful comments on earlier drafts.

The Impact of State Children’s Health Insurance Program (SCHIP) Expansion on Health Insurance Coverage in Hawaii

Abstract

This study investigates the impact of the State Children’s Health Insurance Program (SCHIP) expansion in Hawaii on health insurance coverage among low-income children ages 0 to 18 using the Current Population Survey. We employ a difference-in-differences approach by construction of a control group for which SCHIP eligibility remained constant, and a treatment group for which SCHIP eligibility changed over the observation period. We find that the initial SCHIP implementation of July 1, 2000 resulted in a 20 percent increase in SCHIP beneficiaries, with 87 percent of these children drawn from the ranks of the privately insured. The presence of substantial crowd-out is likely the result of important factors unique to Hawaii’s health insurance environment and implies that the cost to state and federal taxpayers per newly insured child is much higher than the usual per-capita expense. Subsequent expansions to higher federal poverty line that occurred since initial SCHIP implementation also likely generated substantial crowd-out.

JEL classification: I13, I18, I19

Keywords: SCHIP; Medicaid; Crowd-out; Health Insurance.

Introduction

The purpose of this study is three-fold. First, this study assesses the impact of the initial State Children's Health Insurance Program (SCHIP) expansion in Hawaii, which occurred effective July 1, 2000. It extended free public insurance coverage to all children ages 0 to 18 residing in households with incomes not greater than 200 percent of the Hawaii-specific federal poverty level (FPL). Second, this study outlines important features of Hawaii's health insurance environment that increase the likelihood of crowd-out among children. Third, this study assesses take-up of public coverage and crowd-out of private insurance that may have further occurred under the January 1, 2008 expansion of eligibility to children ages 0 to 18 residing in households with incomes between 200 percent and 300 percent of the FPL.

Many studies estimate the impact of Medicaid and SCHIP eligibility expansions on program participation and private insurance coverage. However, no estimates are available for the impact of SCHIP implementation or expansion in Hawaii, a State with a unique health insurance environment. This current study exploits the July 1, 2000 SCHIP implementation in Hawaii to estimate take-up and crowd-out rates among newly-eligible children. Estimates are based on nine calendar years (1998 to 2000 and 2003 to 2008) of the Current Population Survey (CPS) Annual Social and Economic Supplement (ASEC), as the CPS is the only survey that supports small-state-level analysis appropriate for Hawaii.

We use a difference-in-differences (DID) approach to sweep out non-policy-related insurance coverage changes that occurred among children in the State during the

observation period. Prior to the implementation of SCHIP, children in Hawaii were eligible for free medical assistance under Medicaid financing per the following age-income criteria: children under age one were eligible up to 185 percent of the Hawaii-specific FPL; children ages one to five up to 133 percent of the FPL; and children ages six to 18 up to 100 percent of the FPL. On July 1, 2000, SCHIP was implemented in Hawaii as a Medicaid expansion and extended coverage to all children ages 0 to 18 up to 200 percent of the FPL. Thus, children under age one residing in families with income greater than 185 percent of the FPL but not exceeding 200 percent of the FPL, children ages one to five in families with income between 133 percent and 200 percent of the FPL and children ages six to 18 in families with incomes between 100 percent and 200 percent of the FPL became newly-eligible for free medical assistance under SCHIP. This treatment group is tracked during the survey years 1998 to 2000 before eligibility, and during the survey years 2003 to 2008 after eligibility. A combined control group is constructed for which eligibility remained constant over the observation period. This group includes low-income, Medicaid-eligible children ages 0 to 18, and children ages 0 to 18 residing in households with incomes greater than 300 percent of the FPL. Both direct and regression-based estimates of insurance coverage changes among children are produced.

We estimate that 20 percent of eligible children in Hawaii enrolled for public insurance – a 20 percent take-up rate – as a result of initial SCHIP expansion extended to children in families with income up to 200 percent FPL in 2001. However, our crowd-out estimate indicates significant displacement of private insurance, with 87 percent of these newly SCHIP-enrolled children drawn from private plan rolls. This demonstrates a

sizeable shift of coverage costs from households (and potentially, the private sector, through employer-sponsored insurance family plans) to the government and generates large public expenditures per newly-insured child.

Because of a number of factors unique to Hawaii, including Hawaii's Prepaid Health Care Act of 1974 that mandates private sector employment-based coverage, lower middle-class and middle-class families are typically well-insured. In addition, Hawaii's SCHIP administration as a Medicaid expansion further reinforces the likelihood that generous public expansions to children in families with higher income will yield a relatively large number of privately-insured children along with the uninsured. Hawaii's experience demonstrates that SCHIP provisions under the Affordable Care Act may also cause non-negligible national crowd-out.

Literature Review

The seminal paper by Cutler and Gruber (1996) (hereafter, CG) examined crowd-out of private insurance caused by the original Medicaid expansions of the late 1980s and early 1990s. Using the 1987 to 1992 CPS, they constructed a fixed national sample of children and simulated their program eligibility for all states. They then used average eligibility by state, year and age as an instrument to estimate the changes in public coverage, private coverage and the uninsured resulting from program expansion. CG estimate crowd-out among children between 31 to 40 percent.

Since CG, there have been numerous contributions to the literature. Studies differ in three fundamental ways: data employed, estimation methodology and program

expansion analyzed. Like CG, many studies¹ employ cross-sectional survey data from the Current Population Survey (CPS) to take advantage of larger sample size and all-state representation. However, to avoid measurement bias caused by a one-year recall period in the CPS, and to observe actual changes in health insurance coverage over Medicaid/SCHIP expansion periods, other studies² employ longitudinal survey data. However, panel data are not without limitations, as the sample size of a given cohort is very small and not representative at the State level.

Many studies follow the CG simulated instrument methodology and, despite using different data sources to analyze different program expansions, estimate crowd-out of similar magnitude. Using the CPS, Shore-Sheppard (2008) includes additional control variables in her simulated instrument approach to analyze the initial Medicaid expansions and – when using a broader alternate definition – estimates crowd-out of 32 to 59 percent. While Ham and Shore-Sheppard (2005) are unable to find any crowd-out among children caused by the initial Medicaid expansions using the Survey of Income and Participation Program (SIPP), they estimate 51 percent crowd-out when using the CPS. They are further able to demonstrate that fundamental differences in the two survey frameworks drive the very different estimates of crowd-out. In analyzing later public program expansions in the late 1990s and early 2000s using the SIPP to specifically address dataset sensitivity, Gruber and Simon (2008) still find substantial evidence of crowd-out on the order of 30 to 37 percent. Seiber and Florence (2010) analyze expansions through the mid-2000s using CG’s simulated instrument to estimate crowd-out among children

¹ Lo Sasso and Buchmueller (2004); Shore-Sheppard (2008); Seiber and Florence (2010); Dague et al. (2011); Gresenz et al. (2011).

² Yazici and Kaestner (2000); Blumberg et al. (2000); Card and Shore-Sheppard (2004); Ham and Shore-Sheppard (2005); Hudson et al. (2005); Gruber and Simon (2008).

based on parents' firm size. They find crowd-out between 42 and 73 percent among children whose parents work in large firms (>25 employees). As a result of initial national SCHIP expansion in the late 1990s, Lo Sasso and Buchmueller (2004) use CPS data to estimate crowd-out of 50 percent, while Hudson, Selden and Banthin (2005) estimate crowd-out between 39 and 53 percent using the Medical Expenditure Panel Survey (MEPS). Gresenz, Edginton, Laugesen and Escarce (2011), however, despite using the CG approach applied to the CPS, are unable to find any significant evidence of crowd-out resulting from program expansions occurring between 2001 and 2008.

An alternate methodology to CG is the direct comparison of changes in insurance coverage between children made newly-eligible by program expansions and children whose eligibility remained unchanged, first done by Yazici and Kaestner (2000). They estimate crowd-out 19 percent using the National Longitudinal Survey of Youth (NLSY), however, estimates of crowd-out produced by this difference-in-differences (DID) approach are found to be very sensitive to specification of the children in the control group. As a result of initial Medicaid expansion, Blumberg, Dubay and Norton (2000) employ as a control older, low-income children whose age kept them ineligible and estimate crowd-out between zero and 23 percent using the SIPP. Card and Shore-Sheppard (2004) also use the SIPP in their analysis of expansions in the early 1990s, but include children just below income- and age-eligibility limits in their control group. Their estimated range of crowd out is more than double that of Blumberg et al. (2000) – between zero and fifty percent, the latter resulting for children who are newly-eligible under multiple program expansions. Hudson et al. (2005) and Gruber and Simon (2008) both analyze expansions in the late 1990s. Hudson et al. (2005) use high-income

ineligible children from the MEPS as their control and find crowd-out of 44 to 56 percent, while Gruber and Simon (2008) employ both very low- (<100 percent) and higher-income children (200 to 400 percent FPL) and estimate much larger crowd-out between 62 and 111 percent. Using longitudinal administrative Dague, DeLeire, Friedsam, Kuo, Leininger, Meier and Voskuil (2011) estimate an overall crowd-out rate of 20 percent in Wisconsin as a result of State expansions from 2006 to 2009, and a higher rate of 37 percent when children in families with income over 300 percent FPL are the control. This crowd-out is observed even despite a 12-month waiting period for eligible children who otherwise have coverage. However, employing CPS data, they estimate crowd-out in Wisconsin of 100 percent when children made eligible are compared to a control group of children for the rest of the U.S., and 167 percent when compared to children in other Midwest states. Dague et al. (2011) attribute their sizably different findings to small CPS sample-size.

There are currently no studies that analyze the impact of SCHIP expansion in Hawaii. Moreover, studies using a national sample of children and program expansions produce results that are not representative of Hawaii's unique health insurance environment. The current study thus contributes to this literature by estimating the rate of crowd-out of private insurance caused by the initial SCHIP expansion in Hawaii, and proposes reasons specific to Hawaii's health care financing that may drive these results.

SCHIP in Hawaii

The State Children's Health Insurance Program (SCHIP) is Title XXI of the Social Security Act.³ It was passed by Congress as part of the Balanced Budget Act of 1997 – which authorized the first ten years of the program – to complement the efforts of States and territories to provide health insurance for otherwise uninsured low-income children. The Federal government provides generous matching funds under the flat-rate formula specified by the Enhanced Federal Medical Assistance Percentage (FMAP), and States have the flexibility to define income eligibility criteria. However, under direction of the Bush Administration that was particularly concerned about potential crowd-out among median income families, the Centers for Medicaid and Medicare Services (CMS) issued letters to all State Health Directors on August 17, 2007, curtailing eligibility expansions – both past and future – beyond 250 percent of the FPL.⁴ President Bush further vetoed the major SCHIP reauthorization bill and the program received temporary authorization only through spring 2009. Upon taking office, President Obama directed CMS to withdraw the restrictive letter⁵ and on February 4, 2009, signed into law the State Children's Health Insurance Program Reauthorization Act of 2009 (CHIPRA, Public Law 111-3), which extended SCHIP funding through federal fiscal year 2013.⁶ The Affordable Care Act (ACA) of 2010 further extends SCHIP funding through federal fiscal year 2015 and eligibility standards through 2019. Although State budgets are under severe stress, many

³ See the Social Security Administration official website.

http://www.ssa.gov/OP_Home/ssact/title21/2100.htm (last accessed 1 April 2012).

⁴ See testimony by Director Dennis G. Smith before the Committee on Finance, Subcommittee on Healthcare, Wednesday, April 9, 2008. http://www.hhs.gov/asl/testify/2008/04/t20080409c.html#_ftn5 (last accessed 1 April 2012).

⁵ See the Presidential Memorandum.

<http://www.gpoaccess.gov/presdocs/2009/DCPD200900059.pdf> (last accessed 1 April 2012).

⁶ See the Government Printing Office official site. <http://www.gpo.gov/fdsys/pkg/PLAW-111publ3/pdf/PLAW-111publ3.pdf> (last accessed 1 April 2012).

States, including Hawaii, have continued – with generous federal assistance – to vigorously pursue SCHIP enrollment and expand eligibility to provide increased health insurance coverage among children.

Hawaii's Enhanced FMAP is approximately 70 percent throughout the period analyzed in this study, which is a significant direct federal subsidy of health insurance for children and a mechanism to bring federal dollars to Hawaii's healthcare system. As a second-order effect, an additional indirect federal subsidy is also realized to the extent that households and firms in Hawaii are able to reduce their federal tax liability by deducting state tax payments to support the State's share of SCHIP. For households, this will be realized if they itemize their federal deductions and thereby deduct their state income taxes from their federal income taxes, which is the case for most homeowners taking the mortgage interest deduction allowed under federal tax rules to owner-occupied housing. In this way, the State's share of SCHIP is also subsidized in part by federal taxpayers.

Under SCHIP, States have the option of administering the program as a Medicaid expansion, as a stand-alone SCHIP program, or as a combination of the two. In Hawaii, SCHIP is administered as a Medicaid expansion, while the Hawaii Medicaid program itself operates with a Section 1115 demonstration waiver⁷ under the acronym QUEST (Quality care, ensuring Universal access, encouraging Efficient utilization, Stabilizing costs, and Transforming the way health care is provided to public clients). QUEST is a managed care and managed competition approach to health insurance, with coverage for

⁷ Section 1115 of the Social Security Act allows the U.S. Secretary of Health & Human Services to authorize experimental delivery, payment and financing schemes for state Medicaid programs. See https://www.cms.gov/MedicaidStWaivProgDemoPGI/01_Overview.asp (last accessed 1 April 2012).

able-bodied beneficiaries outsourced to the private insurers and health plans, while the aged, blind and disabled beneficiaries – until recently – have remained under the traditional Medicaid fee-for-service payment scheme. Thus, in the data employed, able-bodied SCHIP children become QUEST beneficiaries and disabled SCHIP children become Medicaid fee-for-service beneficiaries.

Under a stand-alone SCHIP program, children covered by private sector insurance, children eligible for family insurance under a State government employee plan and children eligible for Medicaid are ineligible for SCHIP. These provisions are specifically designed to prevent federal financing from displacing private and State financing for children. However, because SCHIP in Hawaii operates as a Medicaid expansion rather than a separate, stand-alone program, these usual restrictions do not apply. The distinction is an important one because SCHIP, as a stand-alone program, is not an entitlement and States are able to discriminate on the basis of other coverage, forcing families to wait long periods after dropping private insurance before obtaining SCHIP coverage for their children. Furthermore, children of State employees with access to group family plans with at least partial financing from their State government are explicitly excluded by the federal SCHIP legislation and are therefore prohibited from enrolling. However, Hawaii SCHIP, as a Medicaid expansion, is, in fact, an entitlement program and children in families that meet the income eligibility criteria are entitled to enroll without any wait period. This includes families with household members who are State employees with private family coverage as an employment benefit option. Thus, crowd-out prevention mechanisms built into SCHIP eligibility rules do not apply to Hawaii SCHIP as a Medicaid expansion.

Data and Methodology

Current Population Survey Data

The current study employs the Hawaii sample of the 1998 to 2008 Current Population Survey Annual Social and Economic Supplement (CPS ASEC) to estimate the insurance coverage of children ages 0 to 18 residing in Hawaii. While longitudinal surveys⁸ have the advantages of *observing* changes in insurance coverage and more recent survey reference periods, their small sample size and lack of identification of small states prohibit their use for this analysis. The CPS is the only survey that supports small-state-level analysis and contains detailed family income data that permits application of the Hawaii-specific poverty guidelines determined by the U.S. Department of Health & Human Services (HHS). The transition years of 2001 and 2002 are excluded from this analysis. Additionally, survey years prior to 1998 are also excluded, as coverage patterns during those years reflect an earlier Medicaid expansion and a contraction from the mid-1990s.

Original tabulations of health insurance coverage among children are produced based on these survey data, and national estimates of the CPS ASEC 2005 to 2008 (as released by the U.S. Census Bureau) are produced to reflect revisions of earlier 2005 and 2006 data releases. Additionally, historical raw CPS ASEC data for survey years 1997 to 2004 are corrected for a coding error. The Census Bureau recodes insurance information for individuals whose responses are either inconsistent with the family coverage or are altogether missing, in which case a “hot deck” procedure is applied. However, because earlier Census Bureau computer algorithms incorrectly classify some individuals as

⁸ Such as the SIPP, NLSY and MEPS.

uninsured when, in fact, they are covered under another household member's family plan,⁹ insurance coverage information for affected observations has been recoded per instructions provided by the Census Bureau.¹⁰ These revisions are relatively substantial for Hawaii. In particular, the overall Hawaii uninsured rate for calendar year 2004 (CPS ASEC 2005) is revised downward from 9.6 percent to 8.3 percent as a result of recoding. All results reported herein thus reflect the latest revisions and recodes.

Medicaid & SCHIP Eligibility Imputation

Income eligibility for public health insurance programs that target low-income families (i.e., Medicaid and SCHIP) is determined using the U.S. Department of Health & Human Services (U.S. HHS) Federal Poverty Guidelines. These are to be distinguished from the Census Bureau poverty thresholds, which follow the Office of Management and Budget's (OMB) Statistical Policy Directive 14. Both are commonly referred to as the "federal poverty line" or "federal poverty level (FPL)," but use of these terms is imprecise, and the distinction between them is particularly important for Hawaii. As an example, when the Census Bureau publishes CPS estimates of the number of uninsured low-income children, research staff follow the OMB directive and apply identical thresholds throughout the 50 States and the District of Columbia. Although the fundamental definition of poverty is, overall, only slightly different between the U.S. HHS and the Census Bureau definitions, the geographic uniformity of the Census Bureau's operational definition renders large differences for Hawaii and Alaska, which have more generous

⁹ See Lee and Stern (2007) for discussion.

¹⁰ <http://www.census.gov/hhes/www/hlthins/data/usernote/index.html> (last accessed 1 April 2012).

definitions of poverty under U.S. HHS Federal Poverty Guidelines. This is demonstrated for 2010 in Table 1.

Table 1. 2010 U.S. HHS Poverty Guidelines, by Family Size

Family Size	Hawaii Annual Family Income	48 Contiguous States & D.C. Annual Family Income
1	\$12,460	\$10,830
2	\$16,760	\$14,570
3	\$21,060	\$18,310
4	\$25,360	\$22,050
5	\$29,660	\$25,790
6	\$33,960	\$29,530
7	\$38,260	\$33,270
8	\$42,560	\$37,010

Notes: For Hawaii family size more than 8 persons, add \$4,300 for each additional person. For U.S. Mainland family size more than 8 persons, add \$3,740 for each additional person. Alaska has separate rates that are higher than those for Hawaii.

To illustrate the effect on Hawaii concretely, we compare our estimates of uninsured children to those of the Census Bureau. The Census Bureau reports that approximately 90,000 Hawaii children resided in families with incomes at or below 200 percent FPL in 2007 based on the 2008 CPS ASEC.¹¹ Table 2, however, demonstrates that applying the Hawaii-specific U.S. HHS Federal Poverty Guidelines for 2007 to the same raw data (2008 CPS ASEC) yields an estimated 126,818 children who resided in families at or below 200 percent of poverty in 2007 (the sum of Total Children in the Medicaid and SCHIP categories for CPS Survey Year 2008). As a consequence, the Census Bureau estimates 6,000 uninsured children at or below 200 percent of poverty in 2007, whereas HHS guidelines render an estimated 8,000 uninsured children at or below

¹¹ See online tables from the Census Bureau.
http://www.census.gov/hhes/www/macro/032008/health/h10_000.htm (last accessed 1 April 2012).

Table 2. Hawaii Uninsured Children, Ages 0 to 18, by Eligibility: CPS 1998 – 2008

Survey Year	Medicaid Eligible			SCHIP Eligible			>200% - 300% FPL			>300% FPL		
	Total Children	Uninsured		Total Children	Uninsured		Total Children	Uninsured		Total Children	Uninsured	
		Count	Rate (%)		Count	Rate (%)		Count	Rate (%)		Count	Rate (%)
1998	94,257	4,805	5.10	57,511	4,704	8.18	76,887	3,668	4.77	79,631	3,865	4.85
1999	82,191	6,401	7.79	73,919	15,766	21.33	47,836	4,399	9.20	125,447	5,338	4.26
2000	93,915	22,095	23.53	81,813	5,311	6.49	42,922	1,151	2.68	130,850	4,521	3.46
2001	72,227	13,216	18.30	61,884	4,676	7.56	70,058	3,665	5.23	113,783	4,499	3.95
2002	90,904	10,794	11.87	78,827	6,702	8.50	63,334	5,413	8.55	93,887	4,711	5.02
2003	84,671	9,674	11.43	69,349	5,583	8.05	62,647	6,718	10.72	123,878	3,068	2.48
2004	81,900	9,454	11.54	58,960	4,668	7.92	71,942	3,934	5.47	114,279	5,359	4.69
2005	57,936	4,324	7.46	62,631	1,637	2.61	65,664	3,085	4.70	116,231	2,676	2.30
2006	63,794	5,536	8.68	56,240	3,384	6.02	73,118	4,752	6.50	127,020	4,023	3.17
2007	61,547	8,538	13.87	58,818	4,887	8.31	75,011	3,063	4.08	114,634	4,498	3.92
2008	63,610	4,406	6.93	63,208	3,668	5.80	58,252	4,308	7.40	119,700	2,594	2.17

Notes: Hawaii low-income children ages 0 to 18 are eligible for free medical assistance under the State's Medicaid program, either through the basic Medicaid or SCHIP financing. In both cases, able-bodied children become QUEST beneficiaries. Eligibility for pregnant women and children follows national standards for the basic Medicaid program: pregnant women and newborns are income eligible up to 185% FPL; children ages 1 to 5 are eligible up to 133% FPL; and children ages 6 to 18 are eligible up to 100% FPL. In Hawaii, the State Children's Health Insurance Program (SCHIP) is administered as a Medicaid expansion and covers all children up to 200% FPL without regard to family assets. Thus, the Hawaii SCHIP program captures newborns residing in families with income >185% to 200% FPL, children ages 1 to 5 with income >133% to 200% FPL and children ages 6 to 18 with income >100% to 200% FPL. Throughout, eligibility is determined by the generous Hawaii-specific U.S. Department of Health & Human Services (HHS) Federal Poverty Guidelines. Income data are based on the family unit. SCHIP eligibility is based on the original expansion of July 1, 2000.

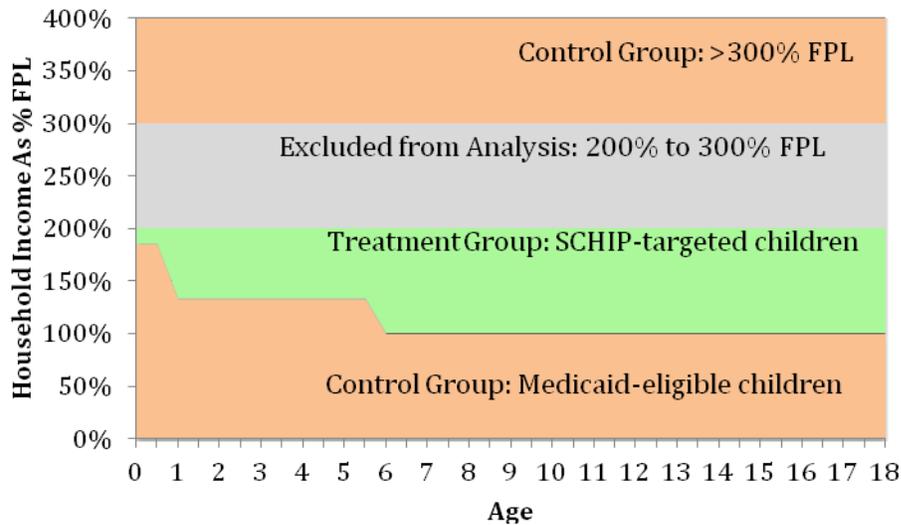
200 percent of poverty. All estimates reported herein are based on the Hawaii-specific U.S. HHS Poverty Guidelines applied appropriately for each year of data analyzed to determine eligibility for Medicaid and SCHIP.

Within the CPS, interviewees are permitted to provide multiple responses to the insurance coverage questions and, therefore, coverage categories are not mutually exclusive in these data. When household members indicate dual coverage, we consider Medicaid/SCHIP (QUEST) the primary source and thereby configure the data as mutually exclusive categories for purposes of this analysis. As indicated by administrative records, Medicaid survey responses are generally an undercount of actual Medicaid enrollment, therefore, our procedure is unlikely to bias enrollment upward.

Empirical Strategy

We define the CPS 1998 to 2000 as the “before” SCHIP period and the CPS 2003 to 2008 as the “after” SCHIP period, omitting the transition years 2001 and 2002. We construct a treatment group for which income eligibility changed over the observation period, and a control group for which eligibility remained constant. These criteria are illustrated in Figure 1. We observe the treatment group – comprised of children aged one year or less in families with income between 185 to 200 percent of FPL, children aged one to five years with family income between 133 to 200 percent of FPL and children aged six to 18 years in families with income between 100 to 200 percent FPL – both before and after the SCHIP expansion effective July 1, 2000.

Figure 1. Treatment and Control Groups, Defined by Program Eligibility



We utilize children in families with income above 300 percent of the FPL plus the Medicaid-eligible children for our control group. By pooling the very low-income and high-income children, we are able to better balance the sample control group against the newly-eligible children in the treatment group. We omit children in families with income between 200 and 300 percent of the FPL – the target of the most recent SCHIP expansion, effective January 1, 2008 – because a separate expansion program targeting this group had starts and stops since 2006, and their inclusion would thereby contaminate our results. This renders a sample from the pooled CPS cross-section of 5,232 children residing in 2,451 households.

We first calculate direct difference-in-differences (DID) estimates based on weighted tabulations of the survey data. We estimate the effect of the initial Hawaii SCHIP expansion on three insurance categories: the uninsured, State-administered public insurance (i.e., Medicaid or SCHIP) and private insurance. The private insurance category includes employment-based group coverage for private and public sector

workers, private non-group coverage, coverage to military families under CHAMPUS/TRICARE¹² and an inconsequential number of children covered under Medicare as dependents. Although the dominant type of insurance in the third category is private, our estimates of crowd-out will potentially capture movement from any of these private and other plans as described to the state-administered program, in particular, SCHIP.

We then move to a regression-based DID approach. While other studies employ binomial logit, probit and linear probability models to predict coverage choice,¹³ we employ a multinomial logit regression model. For each observation, the estimated probabilities of choosing either Medicaid/SCHIP or no coverage are given by

$$\Pr(Y_i = j | \mathbf{X}_i) = \frac{e^{\beta_j' \mathbf{X}_i}}{1 + \sum_{k=1}^j e^{\beta_k' \mathbf{X}_i}}, j = 0, 1, 2. \quad (1)$$

\mathbf{X}_i is a vector comprised of the demographic variables described in Appendix A – including individual and family characteristics that are very similar to those specified in other analyses¹⁴ – as well as binary variables indicating the treatment group of newly-eligible SCHIP children based on our HHS-based income classification; time, indicating the periods before and after SCHIP implementation; and the interaction between

¹² TRICARE is a series of health plans that provide coverage to the dependents of active and retired military personnel and their survivors. TRICARE Standard was formerly known as Civilian Health and Medical Program of the Uniformed Services (CHAMPUS) when the military health system insurance for civilians ran primarily as a fee-for-service scheme. These plans generally cover 3 to 4 percent of the population nationwide. However, due to the presence of a large military complex in Hawaii, 8 to 9 percent of the resident population derives coverage from TRICARE and, therefore, represents an important form of coverage for children. See the following site for a description of military health insurance: <http://tricare.mil/> (last accessed October 23 2011).

¹³ Blumberg et al. (2000).

¹⁴ Cutler and Gruber (1996), Blumberg et al. (2000), Card and Shore-Sheppard (2004), Lo Sasso and Buchmueller (2004), Hudson et al. (2005), Shore-Sheppard (2008) and Gruber and Simon (2008).

“treatment” and “time.” This last binary variable, “DID,” estimates the difference-in-differences: the difference between treatment and control groups in the *change* in insurance coverage from the period before SCHIP expansion to the period after expansion.¹⁵ Similar to previous studies,¹⁶ our model-based difference-in-differences estimates are produced using the marginal effects of the regressors on “treatment,” “time” and “DID.” Appendix B presents covariate means by treatment and control group. As required by the multinomial logit model, coverage choice is not perfectly predicted by any combination of the regressors. Given the small CPS sample associated with a single state, this parsimonious approach is a reasonable way to proceed.

The coefficients of interest are those on the DID variables, as their sign and significance demonstrate any effect of the SCHIP expansion on a child’s probability of having a particular type of insurance coverage. The estimated marginal effects of the DID variable are then used to calculate the take-up of Medicaid/SCHIP and crowd-out of private coverage caused by SCHIP implementation.

Results

The distribution of insurance coverage by treatment group before and after SCHIP expansion in Hawaii is illustrated in Table 3. The last row of the table, DID_{DIRECT}, is the

¹⁵ Ai and Norton (2003) demonstrate that the marginal effects – as usually computed – of interaction terms used as regressors in non-linear models are imprecise, conditional on the other regressors and have significance not testable using traditional t-tests. They provide a consistent estimator and its asymptotic variance for interaction terms used in non-linear models. Further, Athey and Imbens (2006) characterize nonparametric identification of difference-in-difference models and provide a consistent estimator for a general changes-in-changes analysis. However, neither correction is applicable to the multinomial logit model. While preliminary programs exist that attempt to extrapolate the estimator of Ai and Norton (2003) to the multinomial logit model (<http://www.stata.com/statalist/archive/2010-03/msg01664.html>, last accessed 23 October 2011), their validity is not theoretically verified yet.

¹⁶ Ghosh (2011).

unadjusted difference-in-differences estimate for each insurance category; it represents the estimated difference in insurance coverage between treatment and control groups as a

Table 3. Direct Difference-in-Differences Estimates (%)

Group	CPS Survey Year					
	Before Expansion (1998-2000)			After Expansion (2003-2008)		
	Private	Medicaid/ SCHIP	Uninsured	Private	Medicaid/ SCHIP	Uninsured
Control	65.66 (2.93)	26.58 (2.86)	7.76 (1.46)	70.99 (1.27)	23.73 (1.22)	5.68 (0.59)
Treatment	76.94 (4.35)	10.97 (3.01)	12.09 (3.40)	65.90 (2.30)	27.65 (2.17)	6.45 (1.21)
DID _{DIRECT}				-16.37	19.53	-3.56

Notes: The treatment group is comprised of SCHIP-target children residing in families with incomes between the age-specific Medicaid-eligibility levels and 200% FPL. The control group is comprised of children residing in families with incomes within the age-specific Medicaid-eligibility levels, plus children residing in families with incomes above 300% FPL. Private coverage includes employer-sponsored and other group insurance, non-group insurance, CHAMPUS/TRICARE, and an insignificant number of children covered by Medicare. Standard errors are in parentheses.

result of the SCHIP expansion. The DID_{DIRECT} for Medicaid indicates a direct take-up rate of 19.53 percent among the target group from 1998 to 2008 as a result of SCHIP implementation. The DID_{DIRECT} for the uninsured – a decrease of 3.56 percent – indicates that expansion of income eligibility to 200 percent FPL demonstrated success in capturing uninsured children within the targeted income group and getting them covered. However, private insurance coverage fell among children in the treatment (SCHIP target) group, while it increased among children in the control group.¹⁷ The direct crowd-out rate of private insurance as a result of SCHIP implementation is thus 83.82 percent (16.37/19.53).

¹⁷ Calculating the change in insurance coverage for each individual control sub-group (Medicaid-eligible children and children with incomes greater than 300 percent FPL) indicates that the observed increase in private coverage among the pooled control group is caused by an increase in private coverage among children in the higher income sub-group.

The coefficients from the multinomial logit regression predicting Medicaid/SCHIP coverage and no insurance coverage (private insurance is the benchmark group) are presented in Appendix C. Marginal effects for the variables of interest – evaluated at covariate means – are presented in Table 4, alongside the direct DID estimates from Table 3 (column 4) for comparison. The regression-based DID estimates indicate significant changes in Medicaid/SCHIP and private coverage. As shown in the DID_{REG} column, we estimate an SCHIP take-up rate of about 20 over the period of observation.

Table 4. Regression-Based Difference-in-Differences Estimates (%)

	Treatment	Time	DID _{REG}	DID _{DIRECT}
Private Insurance	14.94***	1.04	-17.38***	-16.37
Medicaid/SCHIP	14.60***	0.18	19.93***	19.53
Uninsured	-0.34	-1.22	-2.53	-3.56

*** Significant at 1% level.

This increased public coverage, however, was accompanied by a 17.4 percentage point decline in private insurance coverage among children in the target income group, implying a crowd-out rate of about 87 percent. That is, 87 out of every 100 children who enrolled in SCHIP dropped private coverage in doing so. These estimated changes in coverage are statistically significant and are very similar to our direct estimates. We find no statistically significant change in the number of uninsured children, although the point estimate indicates a 2.5 percentage point decline over the time period analyzed. Our regression-based point estimates thereby imply that of the 17,211 Hawaii children enrolled in SCHIP as of September 2007, only 2,237 children were previously uninsured, while 14,974 children previously had private coverage.

Given our results of initial SCHIP implementation with income eligibility up to 200 percent FPL, we expect that further SCHIP expansion to 300 percent FPL –

implemented effective January 1, 2008 – likely generated even larger crowd-out of private insurance coverage due to five unique features of the Hawaii health care financing system.

First, the Hawaii SCHIP program is administered as a Medicaid expansion and, as such, is an entitlement program that lacks many of the crowd-out-mitigating provisions federal regulations afford stand-alone SCHIP designs. As a state with one of the lowest uninsured rates in the country, this lack of crowd-out-preventing mechanisms is quite surprising. In particular, unlike states with stand-alone SCHIP programs, the children of Hawaii State employees who are otherwise offered family coverage are entitled to SCHIP coverage as long as their families meet income qualifications, thereby creating a very strong financial incentive to drop private coverage.

Second, SCHIP eligibility is defined by the more generous Hawaii-specific U.S. HHS federal poverty guidelines, extending SCHIP coverage to many middle-class families. In 2010, under expanded income eligibility criteria, children in a family of four with household income of \$63,400 per year qualified for free health insurance, and those with income up to \$76,800 qualified for SCHIP coverage on a premium cost-sharing basis. With median income of \$63,746 in Hawaii in 2007,¹⁸ these income eligibility limits render entitlements to a large number of children in middle-class families.

Third, under Hawaii's employer mandate, the Prepaid Health Care Act (1974), private sector firms must offer coverage to their full-time employees. However, offering family coverage is optional and the premium sharing rule that limits the employees'

¹⁸

http://hawaii.gov/dbedt/info/census/acs/ACS2007/ACS_2007_Other_Files/Income_Poverty_in_Hawaii_2007.pdf (last accessed 4 December 2011).

contribution to 1.5 percent of gross wages only applies to single coverage. Thus, working adults with SCHIP-eligible children face a strong financial incentive to drop family coverage from their employer and enroll in single coverage for themselves, while enrolling their children in SCHIP. Alternatively, workers who would not enroll for family coverage may flock to employers that, in lieu of family coverage, offer higher cash wages.

Fourth, Hawaii's Medicaid program operates under a Section 1115 demonstration waiver as a managed care approach to health care delivery. Beneficiaries are covered by contracted private insurers paid at a capitated rate, and because they carry the same insurance card as health plan enrollees with employer-sponsored or group coverage, they are unidentifiable¹⁹ as Medicaid/SCHIP beneficiaries. As such, the stigma typically associated with Medicaid coverage and public assistance is averted and does not discourage parents from dropping private insurance coverage in favor of SCHIP. Moreover, as the majority of SCHIP beneficiaries in Hawaii are covered by the two largest private insurers in the State, they have access to the same large network of healthcare providers as they did under their private plan. Thus, opting to drop private insurance and enroll children in SCHIP likely does not substantially reduce system access, and families are likely able to retain their preferred providers.

Finally, as eligibility criteria is expanded to higher income levels, relatively few children in Hawaii who would become newly SCHIP-eligible lack insurance coverage. We estimate that only 4,300 of the 58,000 children residing in families with incomes between 200 and 300 percent of the Hawaii-specific FPL in 2008 were uninsured. While

¹⁹ Without regard to their group identification number.

these uninsured children nonetheless require coverage to ensure the best health outcomes, it should be recognized that SCHIP expansion to this and higher income groups is likely to yield a relatively large number of privately-insured along with uninsured children.

Taken together, these factors provide a plausible explanation as to why our estimates of crowd-out in Hawaii are larger than those found in national studies. For these reasons, we conclude that initial implementation up to 200 percent FPL, and the further expansion to 300 percent FPL render substantial crowd-out of private insurance. Whether viewed from the broad federal perspective or the narrow state budgetary perspective, the expansion would generate relatively high public expenditures per newly insured child. For those families whose children would be privately insured if not for the free SCHIP coverage, the program is tantamount to a cash transfer.

Conclusion

The current study is the first to estimate the effect of the initial SCHIP implementation in Hawaii on July 1, 2000. Using the Current Population Study for 1998 to 2000 and 2003 to 2008, we employ a regression-based difference-in-differences approach to measure the changes in insurance coverage among the SCHIP-targeted children relative to the changes in insurance coverage among a group of children whose eligibility remained unaffected by the expansion. We estimate that SCHIP implementation caused a 20 percent increase in Medicaid/SCHIP coverage among children in the target group, while simultaneously resulting in a decrease in private insurance coverage of 17.4 percent among this group. We thus estimate substantial crowd-out of private insurance of 87 percent.

These results should be interpreted with caution, however, as there are several limitations to our analysis that make it difficult to draw definitive conclusions. First, these Hawaii-specific estimates of take-up and crowd-out rates are produced with a relatively small CPS sample. This might be the reason our estimated change in uninsured children lacks precision. Second, the CPS is subject to a well-known Medicaid undercount, as the survey responses render much lower enrollment counts than administrative records. This might have affected our estimates. Third, we are unable to independently validate our results from the CPS with estimates from the Hawaii Health Survey (HHS), which indicates no take-up or crowd-out due to the SCHIP expansion. The HHS also renders estimates of the uninsured that are generally inconsistent with the CPS for reasons yet to be determined.

Hawaii's experience is suggestive of possible non-negligible nationwide crowd-out of private insurance as a direct result of SCHIP-related provisions in the Patient Protection and Affordable Care Act (ACA), which extends federal financing for SCHIP through federal fiscal year 2015. First, the legislation grants all states – regardless of SCHIP program administration – the option of offering SCHIP coverage (with matching federal funds per Enhanced FMAP) to children of state employees who qualify for medical benefits, thereby likely giving rise to crowd-out in any state that adopts this policy option. Second, to the extent that private health plans have deeply penetrated Medicaid markets nationwide – of the 47 states that have comprehensive Medicaid managed care programs, 36 contract with managed care organizations (private health

plans) to cover Medicaid beneficiaries²⁰ – parents of newly-eligible children, like those in Hawaii, will likely not hesitate to drop private insurance in favor of private health plan-administered SCHIP coverage with access to the same system of healthcare providers. Finally, the ACA increases the Enhanced FMAP from 2016 through 2019, possibly allowing states to use these matching funds to increase SCHIP eligibility limits to children in higher income groups who already have private insurance coverage.

²⁰ Kaiser Commission on Medicaid and the Uninsured, “Medicaid managed care: key data, trends and issues,” February 2012, <http://www.kff.org/medicaid/upload/8046-02.pdf> (last accessed 1 April 2012).

References

- Ai C, Norton EC (2003). Interaction terms in logit and probit models. *Economics Letters*, 80(1): 123-29.
- Athey S, Imbens GW (2006). Identification and inference in non-linear difference-in-difference models. *Economics Letters*, 74(2): 431-97.
- Blumberg LJ, Dubay L, Norton SA (2000). Did the Medicaid expansions for children displace private insurance? an analysis using the SIPP. *Journal of Health Economics*, 19 (1): 33-60.
- Card D, Shore-Sheppard LD (2004). Using discontinuous eligibility rules to identify the effects of the federal Medicaid expansions on low-income children. *The Review of Economics and Statistics*, 86(3): 752-66.
- Cutler, DM, Gruber J (1996). Does public insurance crowd out private insurance? *The Quarterly Journal of Economics*, 111(2): 391-430.
- Dague L, DeLeire T, Friedsam D, Kuo D, Leininger L, Meier S, Voskuil K (2011). Estimates of crowd-out from a public health insurance expansion using administrative data. *NBER Working Paper Series*, Working Paper 17009.
- Ghosh PP (2011). *Essays on welfare policy-induced migration of mothers*. Dissertation, Clemson University. Ann Arbor: ProQuest/UMI. (Publication No. AAT 3454928).
- Gresenz CR, Edgington SE, Laugesen MJ, Escarce JJ (2011). Take-up of public insurance and crowd-out of private insurance under recent CHIP expansions to higher income children. *NBER Working Paper Series*, No. 17658
- Gruber J, Simon K (2008). Crowd-out 10 years later: have recent public insurance expansions crowded out private health insurance? *Journal of Health Economics*, 27 (2): 201-17.
- Ham JC, Shore-Sheppard L (2005). The effect of medicaid expansions for low-income children on Medicaid participation and private coverage: evidence from the SIPP. *Journal of Public Economics*, 89(1): 57-83.
- Hudson JL, Selden TM, Bantlin JS (2005). The impact of SCHIP on insurance coverage of children. *Inquiry*, 42(Fall): 232-54.
- Lee CH, Stern SM (2007). Health insurance estimates from the U.S. Census Bureau: background for a new historical series. Poverty and Health Statistics Branch, Housing and Household Economic Statistics Division, U.S. Census Bureau.

Lo Sasso AT, Buchmueller TC (2004). The effect of the State Children's Health Insurance Program on health insurance coverage. *Journal of Health Economics*, 23(5): 1059-82.

Seiber EE, Florence CS (2010). SCHIP's impact on dependent coverage in the small-group health insurance market. *Health Services Research*, 45(1): 230-45.

Shore-Sheppard LD (2008). Stemming the tide: the effect of extending Medicaid eligibility on health insurance coverage. *The B.E. Journal of Economic Analysis & Policy*, 8 (2 (Advances)), Article 6.

Yazici EY, Kaestner R (2000). Medicaid expansions and the crowding out of private health insurance among children. *Inquiry*, 37(1): 23-32.

Appendix A. Variable Description

Variable	Description
<i>Dependent Variables^a</i>	
Private*	Child is covered by any private plan, including CHAMPUS/TRICARE
Medicaid/SCHIP*	Child is covered by Medicaid/QUEST or SCHIP
Uninsured* [†]	Child has no insurance coverage
<i>Explanatory Variables</i>	
Age	Age in years
Age ²	Age squared
Age ³	Age cubed
Male*	Child is male
Household income	Sum of all individuals living in household, as a percent of FPL
Household income ²	Household income squared
Household income ³	Household income cubed
Honolulu*	Child lives in the City & County of Honolulu
Non-Honolulu* [†]	Child lives in another county (Hawaii, Maui or Kauai)
White*	Child is white, no other race/ethnicity
Non-white* [†]	Child is any other race/ethnicity (Hispanic, black, Asian or other)
Excellent health*	Parent reports child is in excellent health
Very good health*	Parent reports child is in very good health
Good health*	Parent reports child is in good health
Bad health* [†]	Parent reports child is in fair or poor health
Workers	Number of adult workers in household
College*	Highest degree earned in household is college degree
High school*	Highest degree earned in household is high school diploma
No degree* [†]	No one in household completed high school
Children	Number of children in household

* Dummy variable

[†] Benchmark group

^a All categories are mutually exclusive

Appendix B. Covariate Means, by Treatment Group

Variable	Treatment	Control _{TOTAL}	Control _{LOW}	Control _{HIGH}
Age	9.505 (0.164)	8.698 (.109)	7.038 (.170)	9.814 (.135)
Male	0.536 (0.014)	0.527 (0.008)	0.532 (0.014)	0.523 (0.010)
Household income	1.540 (0.012)	3.490 (0.080)	0.612 (0.014)	5.424 (0.915)
Honolulu	0.73 (0.190)	0.740 (0.011)	0.680 (0.020)	0.780 (0.012)
White	0.157 (0.144)	0.181 (0.009)	0.176 (0.154)	0.176 (0.154)
Excellent health	0.400 (0.021)	0.434 (0.012)	0.367 (0.020)	0.479 (0.0145)
Very good health	0.315 (0.019)	0.326 (0.111)	0.324 (0.019)	0.326 (0.013)
Good health	0.266 (0.019)	0.220 (0.010)	0.274 (0.018)	0.183 (0.011)
Fair health	0.019 (0.005)	0.019 (0.003)	0.034 (0.007)	0.009 (0.002)
Workers	1.439 0.034	1.549 (0.023)	0.915 (0.031)	1.974 (0.026)
College	0.565 (0.022)	0.697 (0.012)	0.415 (0.020)	0.887 (0.010)
High school	0.429 (0.022)	0.284 (0.012)	0.540 (0.020)	0.113 (0.010)
Children	2.640 (0.067)	2.237 (0.032)	2.578 (0.062)	2.008 (0.031)

Notes: The treatment group is comprised of SCHIP-target children residing in families with incomes between the age-specific Medicaid-eligibility levels and 200% FPL; Control_{LOW} is comprised of children residing in families with incomes within the age-specific Medicaid-eligibility levels; Control_{HIGH} is comprised of children residing in families with incomes above 300% FPL; Control_{TOTAL} pools both Control_{LOW} and Control_{HIGH}. Percent of FPL is determined by applying the Hawaii-specific U.S. HHS Poverty Guidelines to the child's household income.

Appendix C. Multinomial Logit Regression Coefficients

	Uninsured	Medicaid/SCHIP
Treatment	-0.239 (0.389)	-1.451*** (0.340)
Time	-0.196 (0.253)	-0.002 (0.189)
DID	-0.219 (0.451)	1.181*** (0.366)
Age	0.017 (0.055)	0.062* (0.035)
Age ²	0.001 (0.003)	-0.003* (0.002)
Male	0.006 (0.139)	0.136 (0.095)
Household income	-0.935*** (0.169)	-1.395*** (0.195)
Household income ²	0.078*** (0.024)	0.126*** (0.043)
Household income ³	-0.002** (0.001)	-0.003* (0.002)
Honolulu	-0.514** (0.211)	-0.760*** (0.148)
White	-0.504** (0.251)	-0.516*** (0.193)
Excellent health	-0.953* (0.525)	-0.518 (0.473)
Very good health	-0.996* (0.526)	-0.415 (0.474)
Good health	-0.871* (0.530)	-0.039 (0.477)
Workers	0.038 (0.128)	-0.157 (0.096)
College	-1.525*** (0.584)	-0.332 (0.603)
High school	(-1.076)* (0.566)	0.162 (0.602)
Children	-0.152 (0.132)	0.133** (0.062)
Constant	2.295*** (0.845)	1.900** (0.768)
F-statistic	18.67	18.67
p-value	0.0000	0.0000

Note: Standard errors in parentheses.

*** Significant at 1% level. ** Significant at 5% level. * Significant at 10% level.