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The Impact of the 2014 Medicaid Expansion on SNAP Participation and Benefits

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I. Introduction¹

The Medicaid expansion of 2014 was a major component of the Patient Protection and Affordable Care Act's (ACA) effort to expand health insurance coverage to all low-income individuals. It increased the income limit for families with children and extended eligibility to all able-bodied adults without dependents (ABAWDs) with income under 138% of the Federal Poverty Line (FPL). Given the extent of changes implemented and the number of individuals affected, the 2014 Medicaid expansion is one of the most significant health care reforms in recent history. While conclusive evidence on its impacts is limited due to its recent implementation, preliminary causal studies show that Medicaid expansions states experienced significant gains in health care coverage and reductions in uninsured rates among low-income populations. In addition, the expansion has improved utilization of services, affordability of care, and financial security among low-income households (Kaestner et al., 2017; Courtmanche et al., 2017; Antonisse et al., 2018). Other effects of the expansion include reduced number of unpaid bills and debt among individuals residing in zip codes with high rates of low-income uninsured individuals and improvements in health among older non-elderly adults (Courtmanche et al., 2018, Hu et al., 2016).

In this study, we test whether the Medicaid expansion had a tangible impact on participation in the Supplemental Nutrition Assistance Program (SNAP) and amount of SNAP benefits received by participants. We exploit state-level variation in Medicaid eligibility rules arising from the 2014 Medicaid expansion in a Difference-In-Difference (DID) framework by comparing households that reside in expansion states to households that reside in non-expansion

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states. Results show that the Medicaid expansion led to modest but statistically significant increases in SNAP participation in expansion states relative to non-expansion states. We also exploit differences in pre-expansion eligibility requirements to show that the impact of the Medicaid expansion on participation was larger for ABAWDs relative to parents of dependent children while SNAP benefits per household increased by a greater amount for parents relative to ABAWDs.

SNAP is the largest nutrition assistance program in the U.S., serving over 42 million individuals and disbursing about \$64 billion in benefits in the year 2017. Unlike other welfare programs that provide assistance to specific demographic groups, such as the Supplemental Security Income (SSI) program for the elderly and the disabled, SNAP serves as a broad safety net for most individuals with gross income below 130% of the FPL. There is substantial evidence that shows that SNAP has been successful in increasing food expenditures, alleviating food insecurity, and decreasing consumption of away-from-home meals among its participants (Hoynes and Schanzenbach, 2009; Burney, 2018; Beatty and Tuttle, 2015; Yen et al., 2008; DePolt, Moffitt, and Ribar, 2009; Nord and Golla, 2009; Ratcliffe, McKernan and Zhang, 2011). In addition, SNAP is somewhat effective at pulling individuals out of poverty. In 2011, SNAP reduced the poverty rate by 8% by lifting about 3.9 million individuals above the FPL. SNAP's antipoverty effect is even greater among extremely poor households. In 2017, SNAP lifted 3.4 million people with family incomes below 50% of FPL out of deep poverty (Tiehen, Joliffe, and Smeeding, 2015). Therefore, SNAP is one the most important social safety net for low-income households.

There are multiple channels through which expanding Medicaid may affect SNAP participation. First, relaxing the income limit for Medicaid eligibility may allow households to

increase labor supply without losing Medicaid benefits. In addition, increased access and utilization of healthcare services through Medicaid may improve overall health and reduce health-related emergencies, thus increasing number of hours worked. The consequent positive effect on income may negatively affect SNAP participation and benefits by obviating the need for additional welfare benefits, reducing the amount of benefits the participant is entitled to receive as benefit amount is linked to income, or making the participant ineligible by pushing him/her beyond the SNAP income limit. Therefore, the Medicaid expansion may result in reduced probability of SNAP participation and reduced SNAP benefits received by the household.

On the other hand, Medicaid expansion may lead to increased SNAP participation. Individuals on the margin of the new income limit may reduce hours worked to become eligible for Medicaid under the new criteria. This reduction in income may lead these individuals to become eligible for SNAP as well. Moreover, individuals that become eligible under expanded Medicaid eligibility may no longer require additional income to cover medical expenses which may discourage labor market participation and therefore lead to greater SNAP participation and greater SNAP benefits. SNAP participation may increase due to non-labor supply factors as well. Enrollment in Medicaid may increase awareness of other welfare programs and may reduce the transaction cost of applying for SNAP.

To the best of our knowledge, this is the first study to examine the impact of the 2014 Medicaid expansion on participation in SNAP and amount of benefits received. Unlike most studies that have evaluated the immediate impacts of the expansion, our analyses rely on observing households for three years past 2014 allowing us to estimate longer term effects of the expansion. In addition, we utilize quarterly data generated from the Consumer Expenditure

Survey (CE) on SNAP participation status and benefit amount at the household level which affords greater variation relative to other studies on the 2014 Medicaid expansion that rely on annual estimates from datasets such as the American Community Survey and the Current Population Survey (Courtmanche et al., 2017; Kaestner et al., 2017). A major study which is likely closest to ours is that conducted by Baicker et al. (2014) which analyzes the effect of Oregon's expansion of Medicaid in 2008 on SNAP participation. While the estimates of Baicker et al. (2014) have considerable internal validity due to randomization resulting from the lottery-based expansion in Oregon, our research design lends greater external validity as we rely on a nationally-representative dataset with households observed over several years before and after the Medicaid expansion. Furthermore, the Medicaid expansion of 2014 affected a larger population of low-income individuals and resulted in a more substantial eligibility expansion relative to the limited expansion in Oregon in 2008.

The rest of this paper is organized in the following way: Section II presents a short review of literature on Medicaid and its effects on labor supply and SNAP participation. Section III discusses the background of the ACA and Medicaid and research design used to determine causal effects of the expansion. Section IV contains an overview of the dataset used and characteristics of the sample. Section V describes empirical estimation, section VI presents results, and section VII concludes.

II. Literature Review

While there is substantial amount of research on the impact of the Medicaid expansion on health care coverage, relatively little attention has been paid to its effect on labor supply and on other welfare programs. Among a handful of studies, Kaestner et al. (2017) utilize the American

Community Survey and the Current Population Survey to show that most estimates on the effect on labor supply are positive but statistically insignificant. They conclude that the 2014 Medicaid expansion did not have a meaningful effect on labor supply in the two years following its implementation. Gooptu et al. (2016) analyze labor market participation among adults below 138% of FPL and determine that the Medicaid expansion did not have a significant effect on employment or job switching in the first fifteen months of the expansion. Unlike Kaestner et al. (2017), their estimates indicate a negative effect of Medicaid coverage on labor force participation. Leung and Mas (2016) corroborate the results of the two studies mentioned by showing that the Medicaid expansion had no significant impact on employment among childless adults. Thus the brief review of literature presented here suggests that the Medicaid expansion had little to no effect on labor supply of participants although this literature is sparse.

Despite the initial evidence on labor supply effects, expanding Medicaid coverage may still have a tangible impact on participation in welfare programs, particularly SNAP. In an important study, Baicker et al. (2014) rely on the lottery-based Medicaid expansion in Oregon in 2008 to conduct the first randomized evaluation of Medicaid's effect on labor supply and welfare program participation. They find that while the Oregon expansion had a trivial impact on labor market outcomes, it led to a 10 percentage point increase in the probability of SNAP receipt. Furthermore, Yelowitz (1996) showed that Medicaid expansions enacted during the 1980s explained a modest but significant increase in the growth of SNAP (known as the Food Stamp Program during the study period) of about 10 percent. Both Baicker et al. (2014) and Yelowitz (1996) attribute changes in SNAP resulting from expanded Medicaid coverage to increased awareness of welfare programs rather than labor supply responses.

III. Background and Research Design

The ACA aimed to achieve virtually universal health care coverage through a “three-legged stool” (Gruber 2011) of reforms. The first leg of the stool included regulations aimed at ending discriminatory practices, such as exclusions for preexisting conditions and guaranteed access, and the establishment of a Health Insurance Marketplace where individuals and families with incomes up to 400% of the FPL could purchase private health insurance. To prevent adverse selection from the influx of riskier individuals that could drive up premiums for all participants, the ACA mandated that all individuals purchase insurance (known as the “individual mandate”) or pay a penalty. The third leg targeted affordability and expanded government subsidies for low-income households (Gruber, 2011). The Medicaid expansion of 2014 was one of such subsidies which relaxed the eligibility criteria to include all individuals with incomes below 138% of the FPL. However, while other legs of the three-legged stool were mostly nationwide reforms, a Supreme Court ruling gave states autonomy in deciding to expand Medicaid or not (Kaiser Family Foundation, 2012). As of November, 2017, 32 states and the District of Columbia had opted to expand coverage (Advisory Board, 2017) with 26 states implementing the expansion at the onset of 2014 and the rest in the following three years (Kaiser Family Foundation, 2013).

We pose the 2014 Medicaid expansion as a quasi-natural experiment and exploit the consequent state level variation to determine the impact of the expansion on SNAP participation and on SNAP benefits. Households that reside in states that expanded Medicaid form the treatment group and households that reside in non-expansion states comprise the control group in the DID model. Precedence for this research design has been set by several studies that use the

expansion as a quasi-natural experiment to study health care coverage, crowd-out of private insurance, labor supply, etc. (Gooptu et al., 2016; Kaestner et al., 2015; Nasseh and Vujicic, 2015). We use multiple definitions of treatment and control groups based on timing of implementation in each state and level of expansion relative to previous eligibility requirements. In addition, we estimate a triple-difference model to examine the heterogeneity of the effect based on household characteristics.

The validity of the DID research design is largely contingent on the exogeneity of state decisions to expand Medicaid. For example, if a state's SNAP participation rate was one of the determinants of its decision to expand Medicaid, the DID estimator will be biased. If SNAP participation rates are negatively correlated with expansion decisions, the DID estimator will be upwards biased and the model will produce significant estimates when no effect exists. However, a deeper look into the background of the ACA shows that political upheaval around the passage of ACA was the main factor behind state decisions to adopt Medicaid. The highly partisan health care debate led Congress to pass the ACA without any Republican votes in the House of Representatives or the Senate and was met by a Republican campaign to "repeal and replace" the law (Jones et al., 2014). A largely Republican coalition of twenty-six states led filed a lawsuit challenging the constitutionality of the ACA shortly after the law was signed (NCSL, 2013). Barrilleaux and Rainey (2014) study the factors that motivated gubernatorial opposition to the Medicaid expansion and found that these decisions were driven almost entirely by politics as opposed to the need of residents. Furthermore, summary statistics reported below show that SNAP participation rates were largely similar in expansion and non-expansion states.

IV. Data

We utilize quarterly household-level data obtained from the 2009 to 2017 cycles of the Consumer Expenditure Survey Interview Survey (CEI). The CEI is a large, nationally-representative survey which tracks about 7,000 households per quarter over a period of four quarters and collects detailed information on income, expenditures, and program participation. CEI households report SNAP participation, average quarterly SNAP benefits received, participation in Medicaid, medical expenses, availability of private health insurance coverage, etc. A full set of sociodemographic characteristics including income, race, education, and state identifiers are available for each household.

Table 1 shows summary statistics and differences in means between Medicaid expansion and non-expansion states for the years 2010 to 2014. While there are statistically significant differences across several demographic characteristics between the two groups, most differences are not economically meaningful. SNAP participation rates and average monthly SNAP benefit per consumer unit are largely similar between the two groups of states. More importantly, perhaps, the proportion of ABAWDs and of parents with dependent children is similar across expansion and non-expansion states. The 2014 Medicaid expansion had a larger impact on ABAWDs since these individuals were ineligible for Medicaid coverage in most states prior to the expansion. On the other hand, parents of dependent children were eligible in all states pre-expansion, therefore, the expansion of eligibility to these individuals was relatively smaller compared to ABAWDs. Summary statistics provide some evidence that the treatment and control groups are balanced across this demographic.

Surprisingly, average annual household income in expansion states is \$8,602 higher relative to non-expansion states. In addition, expansion states include a significantly greater proportion of household heads that are male, college graduates, and are not black. These are important differences that have the potential to bias the DID estimator, therefore, we include these demographic characteristics as explanatory variables in the DID model. Furthermore, we expect the DID coefficients to be attenuated towards zero to the extent these differences bias our estimator. Due to lower mean income, the control group of states are likely to have a greater number of SNAP eligible non-participants which could plausibly have a higher probability of participation in response to the Medicaid expansion. Therefore, the true counterfactual scenario would likely depict a stronger effect than the counterfactual scenario represented by our sample of non-expansion states. An important implication of income differences between the two groups is that state expansion decisions were not based on the need of residents for subsidized health insurance. If that was the case, we would expect states with higher average annual incomes to have a greater likelihood of adopting the expansion.

V. Estimation

The DID framework provides a simple and relatively straightforward approach to evaluate the impact of the Medicaid expansion on SNAP. DID estimates can be obtained from the following regression form:

$$SNAP_{ist} = \phi 1(Post_t = 1 * Expansion_s = 1) + X_{ist}\Lambda + \theta_t + \mu_s + u_{ist} \quad (1)$$

where $SNAP_{ist}$ represents the decision of household i in state s and quarter t to participate in SNAP and the average monthly amount of SNAP benefits received during the quarter. The variable of interest is the interaction between the state and time indicators for Medicaid

expansion. $Post_t$ equals 1 if the CEI household is observed during or after the first quarter of 2014 and 0 otherwise. Similarly, the indicator $Expansion_s$ equals 1 if the household resides in any of the Medicaid expansion states. The coefficient φ represents the change in the probability of SNAP participation and average monthly benefits resulting from the Medicaid expansion in the expansion states relative to non-expansion states. X_{ist} is a vector of household demographics, θ_t and μ_s depict quarter by year and state effects respectively, and u_{ist} is the error term.

Estimating the effect of the Medicaid expansion is not as simple as comparing expansion states with those that chose not to expand. While a large majority of states implemented the expansion in 2014, not all states that began enrolling individuals in the program at that point. A handful of states/territories (such as Washington D.C.) adopted the expansion prior to 2014 to take advantage of the federal cost-share for expanded eligibility and few states (such as Indiana) decided to expand Medicaid well after the first quarter of 2014. Furthermore, there was considerable state-level variation in pre-expansion eligibility levels based on individual employment status, presence of children in household, etc. With few exceptions, states did not generally allow ABAWDs to participate prior to the expansion. While parents with dependent children were eligible in all states, there is wide variation in pre-existing state eligibility rules. For example, the Massachusetts expansion for this group entailed an increase of the income limit from 133% of FPL to 138% FPL while Arkansas expanded the income limit to 138% of FPL from 13% of FPL for jobless parents of dependent children (Kaiser Family Foundation, 2013). Table 2 shows the list of expansion states by timing of expansion and whether the state implemented a partial or full pre-expansion.

In addition to comparing states that expanded Medicaid in 2014 to states that did not, we assign treatment by considering the timing of each state's Medicaid expansion and prevailing

eligibility rules prior to the expansion. We employ several strategies to focus our analysis on households that are most likely to be affected by the expansion. We estimate the model separately by excluding expansion states with a prior (limited or full) Medicaid expansion, by restricting the sample to Medicaid eligible and/or low-income individuals only, and by splitting the sample based on whether household members are characterized as parents of dependent children or able-bodied adults without dependents. Furthermore, we interact the DID interaction in equation (1) with an indicator for whether the household head is an ABAWD or a parent of dependent children to obtain triple-difference estimates. The triple-difference approach provides stronger identification as it relies on weaker assumptions relative to the DID model and has been used in other studies analyzing the 2014 Medicaid expansion (Courtmanche et al., 2016; Courtmanche et al., 2017; Nasseh and Vujicic, 2015).

VI. Results

Table 3 summarizes the results of the DID and the triple-difference models. For the full sample (columns 1 and 2), DID estimates show that the Medicaid expansion resulted in a 0.5% (percentage point) increase in a household's likelihood of participating in SNAP and a \$2.32 increase in average monthly SNAP benefit per household. At the household mean of SNAP participation and average monthly SNAP benefits in the treatment group, these estimates represent a 5.7% increase and a 1.3% increase respectively. The next two panels of columns 1 and 2 show estimates from the triple-difference model. As expected, the impact of the Medicaid expansion on probability of SNAP participation is significantly higher and on SNAP benefits is significantly lower for ABAWDs relative to non-ABAWDs in the sample. These results are intuitive because ABAWDs faced a greater expansion in Medicaid eligibility than any other

group and, therefore, have greatest exposure to treatment in our model. On the other hand, ABAWDs are also more likely to reside in single person households and, unlike parents of dependent children, cannot apply for SNAP participation for others. As a result, the change in household SNAP benefits is significantly smaller for ABAWDs. The triple-difference interaction for parents of dependent children shows a statistically insignificant difference in probability of SNAP participation but a substantial difference in household SNAP benefits relative to non-parents. This is, again, an expected result because the calculation of SNAP benefit amount disbursed to each household allows for deductions from gross income based on household size and dependent care (USDA FNS, 2018). As a result, parents of dependent children receive greater average monthly benefits relative to ABAWDs.

To identify the effect on low-income individuals, we restrict the sample to households below 100% of FPL (columns 3 and 4) and below 138% of FOL (columns 5 and 6). The DID estimates for the 100% FPL sample are substantially larger than the full-sample model and statistically significant. The Medicaid expansion led to a 1% (percentage point) increase in the likelihood of SNAP participation and a \$3.84 increase in monthly SNAP benefits for households under 100% of FPL. The estimates of the triple-difference specifications are informative as well. Similar to the full-sample model, the impact of the Medicaid expansion was larger in magnitude for ABAWDs in terms of both, SNAP participation and monthly benefits, relative to non-ABAWDs. For parents, the triple-difference estimate on SNAP participation is negative and statistically insignificant. This is likely due to the fact that not only were parents under 100% of FPL already eligible for participation in all states prior to the expansion, albeit at different income levels, pre-expansion eligibility requirements for expansion states were more generous relative to non-expansion states. The average income limit for jobless parents was 100% in

expansion states but only 42% in non-expansion states (Kaiser Family Foundation, 2013). As a result, the impact of the Medicaid expansion on SNAP for parents will likely be the result of higher take-up of Medicaid rather than of new eligibility requirements. The estimates from the subsample of households under 138% of FPL (columns 5 and 6) are largely consistent with other specifications. The overall effect of the Medicaid expansion is to increase likelihood of SNAP participation by 0.9% and average monthly SNAP benefits by \$5.28. Triple-difference estimates for both ABAWDs are comparable to the results of 100% FPL subsample. For parents, we would expect the effect on SNAP participation to be larger (or less negative) relative to the 100% FPL sample because, in addition to higher take-up among always-eligible individuals, the 138% FPL subsample includes a greater proportion of newly eligible households. However, the difference in estimates between the two samples is too small to be economically meaningful.

We conduct a series of robustness checks by varying how treatment is assigned to states. The results are shown in Table 4. The estimates in columns 1 and 2 are obtained from a subsample that excludes the 5 states (shown in Table 2) that adopted the Medicaid expansion later than 2014. These estimates are somewhat larger relative to the full sample specification and are have strong statistical significance. In the following two specifications, we focus on states that had implemented a full expansion prior to 2014. Columns 3 and 4 present estimates from the subsample that excludes all full pre-expansion states. The estimates are substantially attenuated relative to the full sample specification and not statistically significant. In columns 5 and 6, we present results from the specification that assigns states with a full pre-expansion to the control group. Similar to the previous specification, the results are highly attenuated and not statistically significant. Therefore, while excluding states that expanded late does not

significantly change our results, the estimates of the DID model are not robust to different treatment assignments for full pre-expansion states.

VII. Conclusion

We identify the causal effect of the 2014 Medicaid expansion on SNAP participation and average monthly SNAP benefit per household by utilizing the Medicaid expansion as a quasi-natural experiment. Households in expansion states form the treatment group and households in non-expansion states form the control group in a DID research design. We find that the expansion led to a 0.5 percentage point increase in a household's probability of participating in SNAP and a \$2.32 increase in average monthly SNAP benefits. At the mean of SNAP participation and average monthly benefit, these estimates represent an increase of 5.7% and 1.3% respectively. The effects are considerably larger for households under 100% and 138% of the FPL. In addition, we consider the differences in pre-expansion eligibility requirements for ABAWDs and parents of dependent children and find substantial heterogeneity in our estimates. As expected, the Medicaid expansion caused a much larger impact on probability of SNAP participation of ABAWDs relative to non-ABAWDs. Also aligned with expectations is the effect on average monthly benefit which was much larger for parents relative to other groups. Our estimates are robust to some methods of assigning treatment but not others.

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Table 1. Pre-Medicaid Expansion Differences between Expansion and Non-Expansion States

	Treat	Control	Difference
SNAP participants	8.8%	9.3%	-0.5% ***
SNAP benefit amount	\$175	\$172	\$3
ABAWDs	42.3%	42.6%	-0.3%
Parents	33.5%	33.2%	0.3%
Number of CU members	2.56	2.47	0.09 ***
Number of children in CU	1.88	1.90	-0.02
Number of elderly in CU	1.32	1.34	-0.03 ***
Household income	\$59,178	\$50,576	\$8,602 ***
Age of HH Head	50.3	49.5	0.8 ***
Employed	67.23%	67.40%	-0.17%
College graduate	41.8%	37.6%	4.2% ***
Black	10.3%	15.5%	-5.2% ***
Female	51.8%	53.5%	-1.6% ***

* p<0.10, ** p<0.05, *** p<0.01

Note 1. Pre-Medicaid period includes years 2009 to 2013

Note 2. The treatment group consists of 22 expansion states and the control group consists of 23 non-expansion states

Table 2. Medicaid Expansion States by Timing and Pre-Expansion Status			
2014 Expansion	Pre-Expansion Partial	Pre-Expansion Full	Late Expansion
Arizona	Indiana	Delaware	Alaska
Arkansas	Maine	Dist. of Columbia	Louisiana
California	Tennessee	Massachusetts	Montana
Colorado	Wisconsin	New York	Pennsylvania
Connecticut	Arizona	Vermont	Indiana
Delaware	California		
Dist. of Columbia	Colorado		
Hawaii	Connecticut		
Illinois	Hawaii		
Iowa	Illinois		
Kentucky	Iowa		
Maryland	Maryland		
Massachusetts	Minnesota		
Michigan	New Jersey		
Minnesota	Oregon		
Nevada	Rhode Island		
New Hampshire	Washington		
New Jersey			
New Mexico			
New York			
North Dakota			
Ohio			
Oregon			
Rhode Island			
Vermont			
Washington			
West Virginia			

Note 1. Classification of states based on Kaester et al. (2015) and the Kaiser Family Foundation (2014).

Note 2. The CEI does not include households from Vermont for the study period.

Table 2. DID and Triple-Difference Estimates on SNAP Participation and Average Monthly SNAP Benefits

	Full Sample		100% FPL		138% FPL	
	Participation (%)	Benefits (\$)	Participation (%)	Benefits (\$)	Participation (%)	Benefits (\$)
Post*Expansion	0.50*** (0.18)	2.32*** (0.53)	1.0** (0.44)	3.84*** (1.33)	0.90** (0.42)	5.28*** (1.26)
Post*Expansion*ABAWDs	2.8*** (0.34)	-9.41*** (0.99)	7.1*** (0.86)	-13.6*** (2.38)	7.9*** (0.81)	-10.6*** (2.17)
Post*Expansion*Parents	0.34 (0.45)	9.2*** (1.74)	-1.2 (0.98)	12.48*** (4.39)	-1.6* (0.90)	11.3*** (4.01)
Observations	310,887	310,887	82,781	82,781	104,274	104,274

* p<0.10, ** p<0.05, *** p<0.01

Note 1. All specifications include covariates for household demographics and state-specific year by quarter trends

Note 2. Standard errors are heteroskedasticity-robust

Note 3. ABAWD refers to Able-Bodied Adult Without Dependents

Table 4. Robustness Checks using Different Treatment Assignments

	<u>Late Expansion Dropped</u>		<u>Full Pre-Expansion Dropped</u>		<u>Full Pre-Expansion in Control</u>	
	Participation (%)	Benefits (\$)	Participation (%)	Benefits (\$)	Participation (%)	Benefits (\$)
Post*Expansion	0.6***	2.84***	0.3	0.79	0.02	-0.45
	(0.18)	(0.55)	(0.18)	(0.57)	(0.19)	(0.56)
	278,624	278,624	280,743	280,743	310,887	310,887

* p<0.10, ** p<0.05, *** p<0.01

Note 1. All specifications include covariates for household demographics and state-specific year by quarter trends

Note 2. Standard errors are heteroskedasticity-robust

Note 3. Specifications in columns 5 and 6 posit expansion states with full prior expansions as control states