

## Quick-scoring guide for the Maryland Scientific Method Scale

		Maximum SMS score	Adjusted SMS score
Method		(method, implementation)	(method, implementation)
Randomised Control Trial (RCT)		5, 5 if	5, 4 if
a.k.a.		Randomisation is successful	• One of the criteria is severely
Field Experiment		Attrition carefully addressed or	violated
		not an issue	5,3 if
		Contamination not an issue	Two or more of the criteria are severely violated
Instrumental Variable (IV)		4, 4 if instrument	Scored as per underlying method if
a.k.a.		Relevant (explains treatment)	Instrument invalid
Two-Stage Least Squares (2SLS)		Exogenous (not explained by outcome)	• e.g cross section with invalid IV scores 2; difference-in-difference with invalid IV scores 3 (see below)
		Excludable (does not directly affect outcome)	
Regression Discontinuity Design		4, 4 if	Scored as per underlying method if
(RDD)		is sharp (e.g. strict eligibility violated requirement) or fuzzy	violated
		discontinuity method used	scores 2; difference-in-difference with invalid IV scores 3 (see below)
		Only treatment changes at boundary	
		Behaviour is not manipulated to     make the cut-off	
Difference in differences (DID)		3,3 if	3, 2 if
<i>a.k.a.</i> Diff in diff		<ul> <li>Control group would have followed same trend and treatment group</li> </ul>	Either of the criteria is not satisfied
		• Known time period for treatment	
Panel methods	Panel Fixed	3, 3 if	3, 2 if
	Effects (FE)	Fixed effect is at the unit of observation	• One or more of the three criteria is not satisfied
		Year effects are included	
		Appropriate time-varying controls are used	
	First Differences (FD)	3, 3 if	3, 2 if
		Year effects are included	Either of the two criteria is not
		Appropriate time-varying controls are used	satisfied
	Arellano-Bond (AB)	3, 3 if	3, 2 if
		<ul><li>Year effects are included</li><li>Appropriate time-varying</li></ul>	One of the two criteria is not satisfied
		controls are used	

Hazard Regressions       Mixed Proportional Hazards (MPH)       4,4 if       4,3 if       4,3 if         Hegressions       Mixed Proportional Hazards (MPH)       4,4 if       4,3 if       4,3 if         Key assumption of 'no anticipation' holds       4,4 if       4,3 if       4,1 if         Key assumption of 'no anticipation' holds       4,2 if       4,3 if       4,1 if         Proportional Hazards (PH)       3,3 if       3,3 if       3,3 if       3,2 if       Nethor of the criteria is not satisfied         Heckman Two-Stage Approach (H2S) Or Control Function (CF)       With IV       4,4 if       4,4 if       Scored as per underlying method if         With DID or panel method       3,3 if       Selection equation includes an IV that satisfies the three criteria (see IV)       Instrument invalid V scores 3; gee belo with invalid IV scores 3 (see belo with invalid IV scores 3 (see belo with invalid IV scores 3 (see belo scores 2; difference-in-difference with invalid IV scores 3 (see belo with invalid IV scores 3 (se	Method		Maximum SMS score (method, implementation)	Adjusted SMS score (method, implementation)
Hazards (PH). Adequate control group is established. One of the two criteria is not satisfiedHeckman Wor-Stage Approach (H2S) Or Control Function (CF)With IV4.4 if . Selection equation includes an IV that satisfies the three criteria . Selection equation includes an IV that satisfies the three criteria . Selection equation includes relevant observable variables . DID or panel criteria netScore as per underlying method if . Instrument invalid . Instrument invalid . e.g. cross section with invalid IV . scores 2; difference-in-difference . With DID or panel method . DID or panel criteria net3.3 if . Selection equation includes relevant observable variables . DID or panel criteria net3.2 if . One of the criteria is not satisfi . Selection equation includes . relevant observable variables . DID or panel criteria satisfied (see below) . Significant common support3.3 if . One of the criteria is violated a . One of the criteria is violated a . One of the criteria is violated a . Significant common supportCross-sectional stack.a. Matching2.2 if . Adequate control variables are . Significant common support2.1 if . Inadequate control variables . Inadequate control variablesEffore-and-after a.k.a. Additionality2.2 if . Adequate control variables are used2.1 if . Inadequate control variablesAdditionality. 2.2 if . Adequate control variables are used2.1 if <br< th=""><th>Hazard</th><th>Proportional</th><th><ul> <li>4, 4 if</li> <li>Key assumption of 'no anticipation' holds</li> <li>Variation in timing (e.g. people start training at different times relative to becoming</li> </ul></th><th><ul> <li>4, 3 if</li> <li>Anticipation of treatment likely</li> <li>Little variation in timing</li> <li>4, 2 if</li> </ul></th></br<>	Hazard	Proportional	<ul> <li>4, 4 if</li> <li>Key assumption of 'no anticipation' holds</li> <li>Variation in timing (e.g. people start training at different times relative to becoming</li> </ul>	<ul> <li>4, 3 if</li> <li>Anticipation of treatment likely</li> <li>Little variation in timing</li> <li>4, 2 if</li> </ul>
Two-Stage Approach (H2S) Or <ul> <li>Selection equation includes an IV that satisfies the three criteria (see IV)</li> <li>Saturent invalid</li> <li>e. g cross section with invalid IV scores 2; difference-in-difference with invalid IV scores 3 (see below and the scores 3 (see below)</li> <li>J. 2 if</li> <li>One of the criteria is not satisfie</li> <li>DID or panel criteria met</li> </ul> Propensity (PSM) (PSM) a.k.a. Matching         With DID or panel method         3,3 if         3,3 if         Selection equation includes relevant observable variables         Selection equation includes relevant observable variables         1,1 if           Score Matching (PSM) (PSM) a.k.a. Matching         With DID or panel method         3,3 if         3,3 if         3,2 if           Cross-sectional         Cross-sectional         2,2 if         1         0ne of the criteria is violated variables           Atching         Cross-sectional         2,2 if         3,3 if         0ne of the criteria is violated variables           Cross-sectional         Cross-sectional         2,2 if         0ne of the criteria is violated variables           Cross-sectional         Cross-sectional         2,2 if         1 if           Significant common support         2,1 if         1 nadequate control variables           Effore-and-affer         2,2 if         1 in adequate control variables           Stated effects//			<ul><li>Adequate control group is established</li><li>Treatment date is known and</li></ul>	One of the two criteria is not
With DID or panel method       3,3 ft       3,2 ft         • Selection equation includes relevant observable variables       • One of the criteria is not satisfi         • DID or panel criteria met       2,1 if         • Selection equation includes relevant observable variables       • Selection equation includes relevant observable variables         Propensity Score Matching (PSM)       With DID or panel method       3,3 if       • Selection equation includes relevant observable variables <i>Atc.a.</i> Matching       3,3 if       • One of the criteria is violated below) <i>a.k.a.</i> Matching       2,2 if       • One of the criteria is violated below) <i>a.k.a.</i> Matching criteria satisfied (see below)       • One of the criteria is violated <i>c</i> ross-sectional       2,2 if       • One of the criteria is violated <i>c</i> ross-sectional       2,2 if       • One of the criteria is violated <i>c</i> ross-sectional       2,2 if       • One of the criteria is violated <i>c</i> ross-sectional       2,2 if       • One of the criteria is violated <i>c</i> 2, 2 if       • Adequate control variables are used       • Inadequate control variables         Before-and-after       2,2 if       • Adequate control variables are used       • Inadequate control variables <i>s.k.a.</i> Additionality       Not SMS sco	Two-Stage Approach (H2S) Or Control	With IV	• Selection equation includes an IV that satisfies the three criteria	
Image: section equation includes relevant observable variablesSelection equation does not include relevant observable variablesPropensity Score Matching (PSM) a.k.a. MatchingWith DID or panel method anal method3,3 if . Matching criteria satisfied (see below) a.blo or panel criteria satisfied (see below)3,2 if . One of the criteria is violated . Inadequate control variables .			Selection equation includes relevant observable variables	
Score Matching (PSM) a.k.a.panel method• Matching criteria satisfied (see below) • DID or panel criteria satisfied• One of the criteria is violatedMatchingCross-sectional • Significant common support2, 2 if • Good matching variables (i.e. relevant to selection) • Significant common support2, 1 if • One of the criteria is violatedCross-sectional • Significant common support2, 2 if • Adequate control variables are used2, 1 if • Inadequate control variables are • Inadequate control variables are • Inadequate control variables are • Inadequate control variablesBefore-and-after • Adequate control variables are used2, 2 if • Adequate control variables are used2, 1 if • Inadequate control variablesStated effects/import a.k.a. AdditionalityNot SMS scoreable • Inadequate control variables2, 1 if • Inadequate control variables		Cross-sectional	Selection equation includes	Selection equation does not include relevant observable
Cross-sectional       2, 2 if       2, 1 if         • Good matching variables (i.e. relevant to selection)       • One of the criteria is violated         • Significant common support       2, 2 if         Cross-sectional regression       2, 2 if         • Adequate control variables are used       2, 1 if         • Inadequate control variables are used       • Inadequate control variables         Before-and-after       2, 2 if       • Inadequate control variables are used         • Adequate control variables are used       • Inadequate control variables         Stated effects/impact       Not SMS scoreable       • Inadequate control variables         a.k.a.       Additionality       Not SMS scoreable       • Inadequate control variables	Score Matching (PSM)		Matching criteria satisfied (see below)	
Adequate control variables are usedInadequate control variablesBefore-and-after2, 2 if · Adequate control variables are used2, 1 if · Inadequate control variablesStated effects/impact 	Matching	Cross-sectional	• Good matching variables (i.e. relevant to selection)	
Adequate control variables are usedInadequate control variablesStated effects/impactNot SMS scoreablea.k.a	Cross-sectional regression		Adequate control variables are	
a.k.a. Additionality	Before-and-after			
	a.k.a.			

Full guide to scoring the evidence available at: <u>http://www.whatworksgrowth.org/resources/scoring-guide/</u>