Refutation of two modern modal logics: JYB4 and follow-on AR4

We assume the method and apparatus of Meth8/VŁ4 with Tautology as the designated *proof* value, F as contradiction, N as truthity (non-contingency), and C as falsity (contingency). The 16-valued truth table is row-major and horizontal.

LET: ~ Not; + Or; & And; > Imply, greater than;
% possibility, possibly, for one or some; # necessity, necessarily, for every or all.

See: J.-Y. Béziau. (2011).“A new four-valued approach to modal logic”. Logique & Analyse, Vol. 54.
J.-Y. Béziau. (2005). “Paraconsistent logic from a modal viewpoint”. Journal of Applied Logic.

We name this system JYB4, after its writer Jean-Yves Béziau. It is less a logic system and more of a model checking system based on 13 axioms for which p and q are assigned ±1 to evaluate models by arithmetic.

(%p&%q)>%(p&q) ;	TTTT TTTT TTTT TTTT	(1.2)
#p>p ;	TTTT TTTT TTTT TTTT	(2.2)
~(p>#p)=(p=p) ;	FCFC FCFC FCFC FCFC	(3.2) x
p>%p ;	TTTT TTTT TTTT TTTT	(4.2)
~(%p>p)=(p=p) ;	CFCF CFCF CFCF CFCF	(5.2) x
#p>%p;	TTTT TTTT TTTT TTTT	(6.2)
~(%p>#p)=(p=p) ;	CCCC CCCC CCCC CCCC	(7.2) x
(#p&#q)=#(p&q) ;	TTTT TTTT TTTT TTTT	(8.2)
~(#(p+q)>(#p+#q))=(p=p) ;	FFFF FFFF FFFF FFFF	(9.2) x
(#p+#q)>#(p+q) ;	TTTT TTTT TTTT TTTT	(10.2)
(%p+%q)=%(p+q) ;	TTTT TTTT TTTT TTTT	(11.2)
~((%p&%q)>%(p&q))=(p=p) ;	FFFF FFFF FFFF FFFF	(12.2) x
%(p&q)>(%p&%q) ;	TTTT TTTT TTTT TTTT	(13.2)

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We name the extension below as doxistic "deviant" logic system AR4, after its writer Fabian Schang.

#p=~%~p ;	TTTT TTTT TTTT TTTT	(14.2)
%p=~#~p ;	TTTT TTTT TTTT TTTT	(15.2)
Paracomplete negation:		
~p=#~p ;	NTNT NTNT NTNT NTNT ;	(16.0.1) x
Paraconsistent negation		
~p=~#p ;	TNTN TNTN TNTN TNTN ;	(17.0.1) x
~p=%~p ;	TNTN TNTN TNTN TNTN	(17.0.2) x
~#p=%~p ;	TTTT TTTT TTTT TTTT	(17.0.3)

For JYB4 Eqs. 1.2-13.2 as rendered, 5 of 13 or about 38% are *not* tautologous. For AR4 Eqs. 14.2-17.0.3, 3 of 6 or 50% are *not* tautologous. We conclude that those statistics remove JYB4 and AR4 from further serious consideration as viable modern modal four-valued logics.