

ÐÐ ï Ýì »éáóÃÛ³ Ý Ñ³ Û³ ñ · Ý³ Ñ³ ï í³ Í ¹ÇÝ³ ÛÇÌ ëì áÈ³ ëì ÇÌ
ÁÝ¹Ñ³ Ýáõñ Ñ³ í³ ë³ ñ³ ÌbéáóÃÛ³ Ý Ûá¹»ÉÌ áßì ³ ÒÈ³ ï³ í³ ñÓ»ñáí*

¶³ Û³ Ý»´³ ñë»ÕÛ³ Ý

ÐÐ Ì»Ýì ñáÝ³ Ì³ Ý µ³ ÝÌÇ ï Ýì »ë³ Ì³ Ý Ñ»ì³ ½áì áóÃÛóÝ»ñÇ í³ ñáóÃÛ³ Ý ï Ýì »ë³ · »ì**,
°äÐ³ ëàÇñ³ Ýì

² Û÷ á÷ áóÛ: ² ÒÈ³ ï³ ÝúáóÛ ÁÝ¹É³ ÕÝí áóÛ ç ÐÐ ï Ýì »éáóÃÛ³ Ý Ñ³ Û³ ñ Ì³ éáóóí³ Í
¹ñ³ Û³ í³ ñÌ³ ÛÇÝ ù³ Õ³ ù³ Ì³ ÝáóÃÛ³ Ý ¹ÇÝ³ ÛÇÌ ëì áÈ³ ëì ÇÌ ÁÝ¹Ñ³ Ýáõñ
Ñ³ í³ ë³ ñ³ ÌbéáóÃÛ³ Ý (DSGE) Ûá¹»ÉÌ ³ ÒÈ³ ï³ ÝùÇ ááóí³ Ý ¹Çì³ ñÌ»Éáí áñà»ë³ ÝÌ³ ï³ ñ
Ûñó³ Ì³ ÛÇÝ ááóí³ (»ÝÁ³ ¹ñí áóÛ ç, áñ³ ÒÈ³ ï³ ááóí³ ÛáóÛ Ûñó³ Ì³ áóÃÛóÝÁ Û»Ý³ ÒÝáñÑ³ ÛÇÝ ç,
ÇëÌ³ ÒÈ³ ï³ í³ ñÓ»ñÁ Ì áßì):

ÁÝ¹É³ Û³ Í Ûá¹»ÉÇ Ì³ éáóóí³ Í ù³ ÛÇÝ · áñÌ³ ÌÇóÝ»ñÇ · Ý³ Ñ³ ï áóÛÁ ÐÐ ï Ýì »éáóÃÛ³ Ý Ñ³ Û³ ñ
Çñ³ Ì³ Ý³ óí áóÛ ç IRFM Û»Áá¹áí: ¶³ áñÌ³ ÌÇóÝ»ñÇ · Ý³ Ñ³ ï í³ Í ³ ñÁ»ùÝ»ñÇ ¹»à ùáóÛ
áóéáóÛÝ³ ëÇñí áóÛ ç ÁÝ¹É³ ÕÝí³ Í Ûá¹»ÉÇ Ñ³ ï ÌáóÃÛóÝ»ñÁ: Ð³ Û»Û³ ï í áóÛ ç ÛÇÝ»áóÛÝ ááíÇ
áóÝ»ó³ Í ³ ½¹»óáóÃÛóÝÁ Ûá¹»ÉÇ ÷ á÷ áÈ³ Ì³ ÝÝ»ñÇ íñ³ Ì áßì · ×Ì áóÝ³ ÒÈ³ ï³ í³ ñÓ»ñÇ
à³ ñ³ · ³ ÛáóÛ: Õá÷ áÈ³ Ì³ Ý»ñÇ ëì³ Ý¹³ ñì Ò»ÕáóÛÝ»ñÇ Ñ³ Û³ ¹ñÛ³ Ûµ »½ñ³ Ì³ óí áóÛ ç, áñ
Ì áßì ³ ÒÈ³ ï³ í³ ñÓ»ñÇ à³ ñ³ · ³ ÛáóÛ Ûá¹»ÉÇ³ ÝóáóÛ³ ÛÇÝ ¹ÇÝ³ ÛÇÌ³ Ý ç³ à»ë ÷ áÈí áóÛ ç:

DSGE Ûá¹»É IRFM Û»Áá¹, ³ ÝÌ³ ï³ ñ³ ÒÈ³ ï³ ÝùÇ ááóí³, · Ý³ · áÛ³ óÛ³ Ý Ì³ É áÛÇ Û»È³ ÝÇ¼, Ì áßì ³ ÒÈ³ ï³ í³ ñÓ»ñ:

1. Û»ñ³ Í áóÃÛóÝ

, ñ³ Û³ í³ ñÌ³ ÛÇÝ ù³ Õ³ ù³ Ì³ ÝáóÃÛ³ Ý ¹ÇÝ³ ÛÇÌ ëì áÈ³ ëì ÇÌ ÁÝ¹Ñ³ Ýáõñ
Ñ³ í³ ë³ ñ³ ÌbéáóÃÛ³ Ý Ûá¹»ÉÝ»ñÁ É³ ÕÝ ÌÇñ³ éáóÃÛóÝ »Ý ëì³ ó»É Ì»Ýì ñáÝ³ Ì³ Ý µ³ ÝÌ»ñÇ
Ì áóÛÇó: ² Õ¹ Ûá¹»ÉÝ»ñÝ ù · ï³ · áñÌí áóÛ »Ý Ì»Ýì ñáÝ³ Ì³ Ý µ³ ÝÌÇ í³ ñù³ · ÇÌÁ ï Ýì »ë³ Ì³ Ý
Çñ³ íÇ×³ ÌÇ ½³ ñ · ³ óÛ³ Ý ï³ ñµ»ñ éó»Ý³ ñÝ»ñÇ ¹»à ùáóÛ Ñ»ì³ ½áì »Éáó Ñ³ Û³ ñ: ø³ ÝÇ áñ
ÝÛ³ Ý Ûá¹»ÉÝ»ñÁ ¹ñ³ Û³ í³ ñÌ³ ÛÇÝ ù³ Õ³ ù³ Ì³ ÝáóÃÛ³ Ý í»ñ³ µ»ñÛ³ ÉáñááóÛÝ»ñÇ Ì³ Û³ óÛ³ Ý
· áñÌíÁÝÁ³ óáóÛ Ñ³ Ý¹Çë³ ÝáóÛ »Ý Ñ»Ýù³ ÛÇÝ Ûá¹»ÉÝ»ñ, ³ á³ ³ é³ Ýóù³ ÛÇÝ ç ¹³ éÝáóÛ
÷³ ëì³ óÇ ï Ýì »éáóÃÛóÝ»ñÇÝ µÝáñáß ³ é³ í»É ç³ Ì³ Ý »ñ»áóÛÝ»ñÇ ³ ñì³ óáÉáóÛÁ ³ Õ¹
Ûá¹»ÉÝ»ñÇ ÛÇÇáóáí:

* ÒÝáñÑ³ Ì³ ÉáóÃÛóÝ »Û Ñ³ Õ¹ ÝáóÛ ÐÐ Ì»Ýì ñáÝ³ Ì³ Ý µ³ ÝÌÇ Éáñññ¹Ç ³ Ý¹³ Õ, ï · ·. Á. ². ÕÌ ñì áÛ³ ÝÇÝ
³ ÒÈ³ ï³ ÝùÇ Ñ³ Ý¹»à óáóó³ µ»ñ³ Í áóß³ ¹ñáóÃÛ³ Ý · ³ ñÁ»ù³ íáñ Éáññáóñ¹Ý»ñÇ Ñ³ Û³ ñ, ÇÝáà»ë Ý³ · ÐÐ
Ì»Ýì ñáÝ³ Ì³ Ý µ³ ÝÌÇ ï Ýì »ë³ Ì³ Ý Ñ»ì³ ½áì áóÃÛóÝ»ñÇ í³ ñáóÃÛ³ Ý ï Ýì »ë³ · »ì, ï · ·. Á. Í. ä áóáéÛ³ ÝÇÝ·
Íñ³ · ñ³ ÛÇÝ ÷³ Á»ÁÇ ï ñ³ Û³ ¹ñÛ³ Ý Ñ³ Û³ ñ:

** ² ÒÈ³ ï³ ÝúÝ³ ñì³ Ñ³ Õ¹ áóÛ ç ÇÛ³ ÝÓÝ³ Ì³ Ý ï »ë³ Ì³ Ý Ñ»ñÁ, áñáÝù Ì³ ñáó »Ý áñ³ ÕÁÝÌÝ»É ÐÐ
Ì»Ýì ñáÝ³ Ì³ Ý µ³ ÝÌÇ à³ Òì áÝ³ Ì³ Ý ¹ÇñúáñáßÛ³ Ý Ñ»ì:

ÐÐ ï Ýì »éáóÃÛ³ Ý Ñ³ Û³ ñ³ ï³ é³ áóóí»É ¿ ¹ñ³ Û³ í³ ñí³ ÒÇÝ ù³ Ò³ ù³ Ì³ ÝáóÃÛ³ Ý ¹ÇÝ³ ÛÇÌ
ëï áÈ³ ëï ÇÌ ÁÝ¹Ñ³ Ýáóñ Ñ³ í³ ë³ ñ³ ÌáéóÃÛ³ Ý Ùá¹»É [1], áñï »Ò³ ÑÈ³ ï³ ÝùÇ áóóí³ Ý
Ï³ ï³ ñÛ³ É Ûñó³ Ìó³ ÒÇÝ ¿ (ýÇñÛ³ Ý»ñÁ ï³ ï³ ÒÇÝ ï Ýì »éáóÃÛáóÝÝ»ñÝ³ ÑÈ³ ï³ ï³ ñÓ»ñÝ
ÁÝ¹áóÝáóÛ »Ý áñá»ë ï ñï³ Í Û»ÍáóÃÛáóÝ), ÇëÏ³ ÑÈ³ ï³ ï³ ñÓ»ñÁ³ ×ÍáóÝ: Ùá³ ï³ Ì
áóÝ»Ý³ Èáí µ³ ñ³ È³ í³ Èáó Ùá¹»ÉÇ Ñ³ Û³ á³ ï³ ëÈ³ ÝáóÃÛáóÝÁ Çñ³ Ì³ ÝáóÃÛ³ ÝÁ³ Ñ Ù¹ Ùá¹»ÉÁ
ÁÝ¹È³ ÛÝì»É¿ [2]³ »ÝÁ³ ¹ñ³ Èáí, áñ Ûñó³ ÌóáóÃÛáóÝÁ³ ÑÈ³ ï³ ÝùÇ áóóí³ ÛáóÛ Ù»Ý³ ÑÝáñÑ³ ÒÇÝ ¿,
ÇëÏ³ ÑÈ³ ï³ ï³ ñÓ»ñÁ³ Íááï : ÙÛ³ Ý »ÝÁ³ ¹ñáóÃÛáóÝÝ»ñÇ ùµÛ»Ï³ Çí á³ ï³ ×³ éÝ³ ÒÝ ¿, áñ
÷³ ëï³ óÇ ï Ýì »éáóÃÛáóÝÝ»ñáóÛ³ ÑÈ³ ï³ Ýù³ ÒÇÝ Í³ é³ ÛáóÃÛáóÝÝ»ñÁ ï³ ñµ»ñ³ Ìí³ Í »Ý
(Û³ ñ¹ÇÌ ÛÇÛÛ³ ÝóÇó ï³ ñµ»ñíáóÛ »Ý Çñ»Ýó Û³ éÝ³ . Çï³ Ì³ Ý Ì³ ñáÓáóÃÛáóÝÝ»ñáí), ÇëÏ
÷á÷áÉíáó ï Ýì »ë³ Ì³ Ý ÇÝýáñÛ³ óÇ³ ÒÇ Ñ³ Û³ á³ ï³ ëÈ³ Ý³ ÑÈ³ ï³ Ýù³ ÒÇÝ
á³ Û³ Ý³ . ñ»ñÁ Á³ Û³ Ý³ ÌÇ Ûáóñ³ ù³ ÝáÛáóñ á³ ÑÇ á»Ý×ß. ñï³ íáóÛ:

² ÛéáÇëáí, éáóÛÝ³ ÑÈ³ ï³ ÝúáóÛ »ÝÁ³ ¹ñáóÛ »Ýù, áñ

1. ² ÑÈ³ ï³ áóóí³ ÛáóÛ Ûñó³ ÌóáóÃÛáóÝÁ Ù»Ý³ ÑÝáñÑ³ ÒÇÝ ¿. ï Ýì »éáóÃÛáóÝáóÛ Ì³ Ý
µ³ ñ³ ÁÇí ï Ý³ ÒÇÝ ï Ýì »éáóÃÛáóÝÝ»ñ, áñáÝóÇó Ûáóñ³ ù³ ÝáÛáóñÁ Û³ éÝ³ . Çï³ ó³ Í ¿
ÛÇ³ ÒÝ Ù»Ï³ ÑÈ³ ï³ ÝùÇ Ù»Ç:
2. ² ÑÈ³ ï³ ï³ ñÓ»ñÁ³ ×ÍáóÝ á»Ý. ³ ÙµáÓÇ³ Ì³ Ý³ ÑÈ³ ï³ ï³ ñÓ»ñÝ³ ÝÙÇÇ³ á»ë á»Ý
×ß. ñï³ íáóÛ ï Ýì »ë³ Ì³ Ý óÝóáóÛÝ»ñÇÝ Ñ³ Û³ á³ ï³ ëÈ³ Ý:

² é³ ÇÇÝ »ÝÁ³ ¹ñáóÃÛáóÝÁ Ñ³ Ý. »óÝáóÛ ¿ ï Ý³ ÒÇÝ ï Ýì »éáóÃÛ³ Ý ï³ ñù³ . ÍÇ
úáí ÇÛ³ È³ óÛ³ Ý ÷á÷áÉáóÃÛ³ Ý³ ÑÈ³ ï³ ÝùÇ áóóí³ ÛáóÛ Ì³ ï³ ñÛ³ É Ûñó³ Ìó³ ÒÇÝ
Çñ³ íÇ×³ ÌÇ Ñ³ Ù»Û³ ï : ² ÛÁ ï Ý³ ÒÇÝ ï Ýì »éáóÃÛáóÝÝ³ é³ í»È³ . áóÛÝÇ ¿ Ñ³ éóÝáóÛ Çñ
Ï»Ýé³ Á³ Û³ Ý³ ÌáóÇ³ ÝÇ ù. ï³ Ì³ ñáóÃÛ³ Ý éá³ éíáó³ ñÁ»úÁ³ Ñ³ áíÇ³ éÝ»Èáí áá ÛÇ³ ÒÝ
µÛáóÇ»ï³ ÒÇÝ é³ ÑÛ³ Ý³ ÷³ ÌáóÛÁ, ³ ÒÈ³ Çñ³ ÑÈ³ ï³ ÝùÇ ÝÍ³ ï Û³ Ùµ áóóí³ ÛáóÛ Ó³ ï áñí³ Í
á³ Ñ³ ÝÇ³ ñíÇ ýáóÝÍóÇ³ Ý: ³ óÇ³ Ù¹, »Á³ Ì³ ï³ ñÛ³ É Ûñó³ Ìó³ ÒÇÝ³ ÑÈ³ ï³ ÝùÇ áóóí³ ÒÇ
á³ ñ³ . ³ ÛáóÛ³ ÑÈ³ ï³ áÓÁ³ é³ í»È³ . áóÛÝÇ ¿ñ Ñ³ éóÝáóÛ ù. ï³ Ì³ ñáóÃÛáóÝÁ Áëï Çñ
³ é³ Ç³ ñí³ Í ¼µ³ Òí³ ÍáóÃÛ³ Ý Û³ Ì³ ñ³ ÌÇ (ï ñï³ Í³ ÑÈ³ ï³ ï³ ñÓÇ³ »áúáóÛ), ³ á³ Ñ ÛÁ
ï Ý³ ÒÇÝ ï Ýì »éáóÃÛáóÝÁ Û³ ùèÇÛ³ È³ óáóÛÁ Ì³ ï³ ñáóÛ ¿ Áëï³ ÑÈ³ ï³ ï³ ñÓ»ñÇ, áñÇó Ñ»ï á
ÛÇ³ ÒÝ, Ñ³ Û³ Ó³ ÒÝ Çñ³ ÑÈ³ ï³ Ýù³ ÒÇÝ é³ éáóñèÇ Ñ³ Ý¹»á³ éí³ á³ Ñ³ ÝÇ³ ñíÇ ýáóÝÍóÇ³ ÒÇ,
áñááíáóÛ ¿³ é³ Ç³ ñí³ íáó ¼µ³ Òí³ ÍáóÃÛ³ Ý Û³ Ì³ ñ³ ÍÁ (ù. ï³ Ì³ ñáóÃÛáóÝÁ³ é³ í»È³ . áóÛÝÇ
Ñ³ éóÝáó³ ÑÈ³ ï³ ï³ ñÓÇ³ á³ ñ³ . ³ ÛáóÛ):

ºñíñáñ¹ »ÝÁ³ ¹ñáóÃÛáóÝÁ³ ÑÈ³ ï³ ï³ ñÓ»ñÇ³ Íááï áóÃÛáóÝÝ ¿: ºñ³ áóÛÇ
Ùá¹»È³ íáñÛ³ Ý Ñ³ Ù¹ ÝÇ »Ò³ Ý³ Ì ¿ . Ý»ñÇ³ Íááï áóÃÛáóÝÝ»ñÇ Ùá¹»È³ íáñÛ³ Ý Ì³ ÈáÛ (1983)
³ é³ Ç³ ñí³ Í Ù»È³ ÝÇ¼µÁ (³ ÒÝ³ ñ¹»Ý ù. ï³ . áñí³ í³ Í ¿ í»ñáÝßÛ³ É Ùá¹»ÈáóÛ [1]
³ áñ³ ÝùÝ»ñÇ . Ý»ñÇ³ Íááï áóÃÛáóÝÝ»ñÁ Ùá¹»È³ íáñ»ÈÇ): Ùáí³ Í Ù»È³ ÝÇ¼µÁ
· ñ³ Ì³ ÝáóÃÛáóÝáóÛ È³ ÒÝ ï³ ñ³ ÍáóÛ áóÝÇ Ñ³ ï³ Ì³ á»ë³ áñ³ ÝùÝ»ñÇ . Ý»ñÇ³ Íááï áóÃÛáóÝÝ»ñÁ
Ùá¹»È³ íáñ»ÈÇ. ³ ÒÝ ÁáóÛ ¿ ï³ ÈÇ éýÇñÛ³ ÒÇ ÛÇÌñáí Ýì »ë³ Ì³ Ý³ ï³ ñù³ . ÍÇ ùÝÝ³ ñíÛ³ Ý

ŪÇçáóáí¹ áõñë µ»ñ»É · ñ³ Ī³ YáõÃŪáõYáõŪ áñà»è Yáñ»ŪYēŪ³ Y ūÇĶçàèç Īáñ Ñ³ Ū ĪÇ³
³ éYááõÃŪáõYÁ: ê³, ÇÑ³ ñĪ», ãÇ µ³ ó³ éáõŪ¹ ñ³ ÇŪÁYi ñ³ Yú³ ŪÇY ĪÇñ³ éáõÃŪáõYÁ,
 Ū³ eY³ íáñ³ à»è³ Ñ³ Ī³ ñó»ñÇ Īáñi áõÃŪáõYŪY»ñÁ Ūá¹»É³ íáñ»Ķç: ŪŪ³ Y ĪÇñ³ éáõÃŪ³ Y
 Ī³ ñ»Ķç Ķ Ñ³ Y¹Çà»É³ ñë»·, Ð»Y¹»ñëáY, È»íÇY (2000) Ñ»ŪÇY³ ĪY»ñÇ [3], ÇēĪ³ í»Ķç áõß Y³ ·
 ¶³ ĶÇ³ Ñ³ Ñ³ Ī³ YúY»ñáõŪ: Ñ³ Ñ³ Ī³ YúáõŪ Ñ³ Ñ³ Ī³ ñó»ñÇ Īáñi áõÃŪáõYŪY»ñÁ
 Ūá¹»É³ íáñ»Ķç Yá³ Ī³ Ī³ Ñ³ ñŪ³ ñ Ķ »Ū»É ū· Ī³ · áñĪ³»É Ñ»Yó³ Ūē »Ū³ Y³ ĪÁ` »Ķ»Ķáí³ ŪY
 Ñ³ Y³ Ū³ YúÇó, áñ YĪ³ Ī³ Ūáí »óáõŪÁ ÁáõŪē Ķ Ī³ Ķçē ÷ á÷ áĒ³ Ī³ YŪY»ñÇ ŪÇç³ Ī³ à»ñÁ
 ēĪ³ Y³ É Ī³ YĪ »ē³ Ī³ Y · áñĪ³ Ī³ Ķ ŪÇĪñáí³ ñŪ³ · ĪÇ ūYŪ³ ñĪŪ³ Y ŪÇçáóáí: `É³ Yá³ ñ¹ ·
 ¶³ Ķ [4] Ñ»ŪÇY³ ĪY»ñÁ Ñ³ Ñ³ Ī³ ñó»ñÇ Īáñi áõÃŪáõYÁ Ūá¹»É³ íáñ»É»Y` »YÁ³ ñ»Ķáí, áñ
³ ŪY Ī³ ñ³ · ñí áõŪ Ķ Ū³ eY³ ĪÇ ×ß· ñĪ Ū³ Y Ūá¹»Ķáí: Ñ³ ĪY³ Ū³ Ķ, áñ³ Ūē »Ū³ Y³ ĪÇ³ »àúáõŪ
 óáõó³ YÇBŪY»ñÇ ŪÇç³ ēĪ³ óí³ Ī³ éYááõÃŪáõYÁ áñ³ Ķ ŪÇĪñáí YĪ »ē³ Ī³ Y ÑÇŪŪ ááõYÇ³
 Ī YĪ »ē³ Ī³ Y ŪÇç³ íáñÇ Ī³ ñŪ³ · ĪÇ ūYŪ³ ñĪ áõŪ ãÇ »YÁ³ ñáõŪ:

² ŪēàÇēáí, í»ñáYŪ³ É »YÁ³ ñáõÃŪáõYŪY»ñÁ Ñ³ Y³ »óYáõŪ »Y yÇñŪ³ Y»ñÇ³ · Ī³ Y³ ŪÇY
 Ī YĪ »éáõÃŪáõYŪY»ñÇ Ī³ ñŪ³ · ĪÇ ÷ á÷ áĒ³ áõÃŪ³ Y: Ñ³ Ñ³ Ī³ YúáõŪ YĪ³ ñ³ · ñí áõŪ³ ·
 Ū»ĪY³ µ³ Yí áõŪ »Y³ Ū³ ÷ á÷ áĒ³ áõÃŪáõYŪY»ñÁ, áñÇó Ñ»i á ÐÐ Ī YĪ »éáõÃŪ³ Y Ñ³ Ū³ ñ
 · Y³ Ñ³ Ī³ í áõŪ »Y ÁY¹É³ ŪY³ Ī Ūá¹»Ķ Ī³ éáõóí³ Ī³ Ū³ ŪÇY · áñĪ³ ĪÇóY»ñÁ IRFM (Impulse
 Response Function Matching) Ū»Áá¹áí: Ð³ Ū³ ó³ ŪY³ Ū³ Ū»Áá¹Ç³ Y³ È ÷³ ēĪ³ óÇ
 Á³ Ū³ Y³ Ī³ ŪÇY Ñ³ ñŪ»ñÇ ū· Ī³ · áñĪ³ Ū³ Ūµ · Y³ Ñ³ Ī³ í áõŪ Ķ VAR(1) Ūá¹»É áñÇó Ñ»i á ŪÇ`YáõŪY
 BáĪÇ á³ ñ³ · ŪáõŪ Ñ³ Ū»Ū³ Ī³ í áõŪ »Y VAR(1) · DSGE Ūá¹»ĶY»ñÇ ÷ á÷ áĒ³ Ī³ YŪY»ñÇ
³ ñó³ · Ūú»ñÁ (IRF-»ñÁ) · ÁYi ñí áõŪ Ķ · áñĪ³ ĪÇóY»ñÇ³ ŪY ĪáŪµÇY³ óÇ³ Y, áñÁ
 YĪ³ ½³ · áõŪYÇ Ķ Ñ³ éóYáõŪ ĶŪàÇñÇĪ³ · Ī »ē³ Ī³ Y IRF-»ñÇ ŪÇç³ Ñ»é³ íáñáõÃŪáõYÁ¹: ŪŪ³ Y
 Ūáí »óŪ³ Y Ī³ ñ³ Ū³ µ³ YáõÃŪáõYÁ Ī³ Ū³ YáõŪ Ķ Ñ»i · Ū³ ÉáõŪ, ū³ YÇ áñ DSGE Ūá¹»Ķ Éáóí áõŪY
 Çñ»YÇó Y»ñĪ³ Ū³ óYáõŪ Ķ VAR(1), áõēĪ Ç ÷³ ēĪ³ óÇ Ī³ Ū³ ÉY»ñáí · Y³ Ñ³ Ī³ Ī³ VAR(1)
 Ūá¹»Ķ ÑÇŪ³ Y íñ³ ēĪ³ óí áõ IRF-»ñÁ Ī³ éáõóí³ Ī³ Ū³ ŪÇY Ūá¹»Ķ (DSGE) · áñĪ³ ĪÇóY»ñÇ
 í »ñ³ µ»ñŪ³ ÉÇYáñŪ³ óÇ³ »Y á³ ñáõY³ Ī áõŪ:

¶³ Y³ Ñ³ Ī³ Ū³ Y YĪ³ Ī³ Ū»Áá¹Y³ é³ ÇÇY³ Y³ Ū ū· Ī³ · áñĪ³ í»É Ķ è áí »Ūµ»ñ³ · Ī³ áõ¹Yáñ¹
 [5] Ñ»ŪÇY³ ĪY»ñÇ ĪáŪŪÇó · Ū»Ī Ñ»i³ ūññáõÃŪ³ Y³ ñÁ³ Yó»É áĶáñi Ç Ū³ eY³ · »i Y»ñÇ
 ĪáŪŪÇó: ä³ Ī³ ×³ éÁ á³ ñ½ Ķ · áñĪ³ ĪÇóY»ñÇ · Y³ Ñ³ Ī³ áõŪY Çñ³ Ī³ Y³ óí áõŪ Ķ ÑÇŪŪ ÁY¹ áõY»Ķáí
 Ūá¹»Ķ IRF-Á (Impulse Response Function), áñY áõŪŪ³ ĪÇáñ»Y Y»ñĪ³ Ū³ óYáõŪ Ķ³ Ū³ Ūá¹»Ķ
¹ÇY³ ŪÇĪ³ Y, ÇYáY ĶÉ í»ñÇY Ñ³ Bí áí Ñ³ Y¹Çē³ YáõŪ Ķ Ū³ Īñáí YĪ »ē³ · »i Y»ñÇ
 Ñ»i³ ūññáõÃŪ³ Y ÑÇŪY³ Ī³ Y³ é³ ñĪ³ Y: ŪBí³ Ī³ Ū»Áá¹Y ū· Ī³ · áñĪ³ í»É Ķ µ³ ½³ ĶÇí
³ Ñ³ Ī³ YúY»ñáõŪ, áñáYóÇó Ī³ ñ»Ķç Ķ³ é³ YÓY³ óY»É [6]-[11]:

¹ ŪBí³ Ī³ · áñĪ³ áõáõÃŪáõYŪY»ñY Çñ³ Ī³ Y³ óí »É Ķ MatLab ŪÇç³ Ī³ ŪáõŪ · áñĪ³ áõ Ī³ ñ³ ŪÇY ÷³ Á»Ááí:

${}^2 B\ddot{E}^3 i^3 Y\dot{u}\check{C}$ í »ñçáòù, $A\acute{Y}^1\acute{E}^3 \ddot{U}i^3 \acute{I}$ ${}^1\check{C}\acute{Y}^3 \ddot{U}\check{C}\acute{I}$ $\acute{e}i$ $a\acute{E}^3 \acute{e}i$ $\check{C}\acute{I}$ $A\acute{Y}^1\acute{N}^3 Y\acute{a}\ddot{o}\ddot{n}$
 $\acute{N}^3 i^3 \acute{e}^3 \acute{n}^3 \acute{I}$ $\acute{B}\acute{e}\acute{a}\acute{o}\acute{A}\acute{U}^3 Y$ $\acute{U}\acute{a}^1 \gg \acute{E}\check{C}$. $\acute{a}\acute{n}\acute{I}^3 \acute{I}\check{C}\acute{o}\acute{Y} \gg \acute{n}\check{C}$. $Y^3 \acute{N}^3 i^3 \acute{I}^3 \acute{I}$ ${}^3 \acute{n}\acute{A} \gg \acute{u}\acute{Y} \gg \acute{n}\check{C}$ $\acute{a}^3 \acute{n}^3 \cdot {}^3 \acute{U}\acute{a}\acute{o}\acute{U}$
 $\acute{a}\acute{o}\acute{e}\acute{a}\acute{o}\acute{U}\acute{Y}^3 \acute{e}\check{C}\acute{n}\acute{i}\acute{a}\acute{o}\acute{U}$ » $Y \acute{U}\acute{a}^1 \gg \acute{E}\check{C}$ $\acute{N}^3 i^3 \acute{I}\acute{a}\acute{o}\acute{A}\acute{U}\acute{a}\acute{o}\acute{Y}\acute{Y} \gg \acute{n}\acute{A}$ $\acute{u}\acute{Y}\acute{Y}^3 \acute{n}\acute{I} \gg \acute{E}\acute{a}\acute{i}$ $\acute{U}\acute{a}^1 \gg \acute{E}\check{C}$ ${}^1\check{C}\acute{Y}^3 \ddot{U}\check{C}\acute{I}$ $i^3 \acute{n}\acute{u}\acute{A}$ $i^3 \acute{n}\mu \gg \acute{n}$
 $\acute{B}\acute{a}\acute{I} \gg \acute{n}\check{C}\acute{Y}^3 \acute{n}\acute{o}^3 \cdot {}^3 Y\acute{u} \gg \acute{E}\acute{a}\acute{o}$ $i^3 \gg \acute{e}^3 Y\acute{i} \acute{U}\acute{a}\acute{o}\acute{Y}\check{C}\acute{o}$: ${}^3 \acute{o}\check{C}^3 \acute{U}^3 \acute{u}^3 Y\check{C}$ $\acute{a}\acute{n}^3 \acute{e}^3 Y\acute{o}\acute{Y}^3 \acute{I}\check{C}$ $\acute{N}^3 i^3 \acute{u}\acute{n}\acute{u}\acute{n}\acute{a}\acute{o}\acute{A}\acute{U}\acute{a}\acute{o}\acute{Y}$
 \check{C} $Y \gg \acute{n}\acute{I}^3 \acute{U}^3 \acute{o}\acute{Y}\acute{a}\acute{o}\acute{U}$ ${}^1 \acute{n}^3 \acute{U}^3 i^3 \acute{n}\acute{I}^3 \acute{U}\check{C}\acute{Y}$ $\acute{u}^3 \acute{O}^3 \acute{u}^3 \acute{I}^3 Y\acute{a}\acute{o}\acute{A}\acute{U}^3 Y$ $\div \acute{a}\acute{E}^3 Y\acute{o}\acute{U}^3 Y$ $\acute{a}\acute{o}\acute{O}\acute{a}\acute{o}$ $i\acute{n}^3$
 ${}^3 B\ddot{E}^3 i^3 i^3 \acute{n}\acute{o} \gg \acute{n}\check{C}$ $\acute{I}\acute{a}\acute{B}\acute{i}$ $\acute{a}\acute{o}\acute{A}\acute{U}^3 Y$ $\acute{a}\acute{o}\acute{Y} \gg \acute{o}^3 \acute{I}$ ${}^3 \frac{1}{2} \gg \acute{o}\acute{a}\acute{o}\acute{A}\acute{U}^3 Y$ $\acute{a}\acute{o}\acute{e}\acute{a}\acute{o}\acute{U}\acute{Y}^3 \acute{e}\check{C}\acute{n}\acute{a}\acute{o}\acute{A}\acute{U}\acute{a}\acute{o}\acute{Y}\acute{A}$, ${}^3 \acute{a}^3$
 $\acute{N}^3 \acute{U}^3 \acute{a}^3 i^3 \acute{e}\acute{E}^3 Y$ ${}^1 i^3 \acute{a}\acute{O}\acute{a}\acute{o}\acute{A}\acute{U}\acute{a}\acute{o}\acute{Y}\acute{Y} \gg \acute{n}$ $\acute{I}^3 i^3 \acute{n}^3 \acute{E}\acute{a}\acute{o}$ $Y\acute{a}^3 i^3 \acute{I}\acute{a}\acute{i}$ $\ddot{U}\check{C} \cdot Y\acute{a}\acute{o}\acute{U}\acute{Y}$ $\acute{B}\acute{a}\acute{I}\check{C}$ $\acute{a}\acute{o}\acute{Y} \gg \acute{o}^3 \acute{I}$
 ${}^3 \frac{1}{2} \gg \acute{o}\acute{a}\acute{o}\acute{A}\acute{U}\acute{a}\acute{o}\acute{Y}\acute{A}$ $\acute{U}\acute{a}^1 \gg \acute{E}\check{C}$ $\div \acute{a} \div \acute{a}\acute{E}^3 \acute{I}^3 Y\acute{Y} \gg \acute{n}\check{C}$ $i\acute{n}^3$ ${}^1\check{C}\acute{i}$ ${}^3 \acute{n}\acute{I}\acute{i}\acute{a}\acute{o}\acute{U}$ \check{C} $\ddot{U}\check{C}$ ${}^1 \gg \acute{a}\acute{u}\acute{a}\acute{o}\acute{U}$, $\gg \acute{n}\mu$
 ${}^3 B\ddot{E}^3 i^3 i^3 \acute{n}\acute{o} \gg \acute{n}\acute{A}$ $\times \acute{I}\acute{a}\acute{o}\acute{Y} \gg Y$, $\acute{U}\acute{U}\acute{a}\acute{o}\acute{e}$ ${}^1 \gg \acute{a}\acute{u}\acute{a}\acute{o}\acute{U}$, $\gg \acute{n}\mu$ ${}^1 \acute{n}^3 Y\acute{u}$ $\acute{I}\acute{a}\acute{B}\acute{i}$ $\gg Y$:

${}^2 \acute{U}\acute{e}\acute{a}\check{C}\acute{e}\acute{a}\acute{i}$, ${}^3 B\ddot{E}^3 i^3 Y\acute{u}\acute{A}$ $B^3 \acute{n}^3 \acute{n}\acute{i}^3 \acute{I}$ \check{C} $\acute{N}^3 i^3 \cdot \acute{U}^3 \acute{E}^3 \acute{N}^3 \gg \acute{n}\acute{A}^3 \acute{I}^3 Y\acute{a}\acute{o}\acute{A}\acute{U}^3 \acute{U}\mu$. ${}^3 \acute{e}^3 \check{C}\check{C}\acute{Y}$ $\acute{U}^3 \acute{e}\acute{a}\acute{o}\acute{U}$
 $Y \gg \acute{n}\acute{I}^3 \acute{U}^3 \acute{o}\acute{i}\acute{a}\acute{o}\acute{U}$ \check{C} $\acute{y}\check{C}\acute{n}\acute{U}^3 Y \gg \acute{n}\check{C}$ $\cdot i^3 Y^3 \acute{U}\check{C}\acute{Y}$ $i^3 Y\acute{i}$ $\gg \acute{e}\acute{a}\acute{o}\acute{A}\acute{U}\acute{a}\acute{o}\acute{Y}\acute{Y} \gg \acute{n}\check{C}$ $i^3 \acute{n}\acute{u}\acute{A}$ $Y\acute{a}\acute{n}$ $\gg Y\acute{A}^3 \acute{n}\acute{a}\acute{o}\acute{A}\acute{U}\acute{a}\acute{o}\acute{Y}\acute{Y} \gg \acute{n}\check{C}$
 $\acute{a}^3 \acute{U}^3 Y\acute{Y} \gg \acute{n}\acute{a}\acute{o}\acute{U}^2$, $\gg \acute{n}\acute{I}\acute{n}\acute{a}\acute{n}^1 \acute{U}^3 \acute{e}\acute{a}\acute{o}\acute{U}$ $Y\acute{i}^3 \acute{n}^3 \cdot \acute{n}\acute{i}\acute{a}\acute{o}\acute{U}$ \check{C} $\acute{U}\acute{a}^1 \gg \acute{E}\check{C}$ $\acute{I}^3 \acute{e}\acute{a}\acute{o}\acute{o}\acute{i}^3 \acute{I}\acute{u}^3 \acute{U}\check{C}\acute{Y}$ $\cdot \acute{a}\acute{n}\acute{I}^3 \acute{I}\check{C}\acute{o}\acute{Y} \gg \acute{n}\check{C}$
 $\cdot Y^3 \acute{N}^3 i^3 \acute{U}^3 Y$ $\acute{U} \gg \acute{A}\acute{a}^1 \acute{A}$ $\cdot \acute{e}i$ ${}^3 \acute{o}\acute{i}^3 \acute{I}$ ${}^3 \acute{n}^1 \acute{U}\acute{a}\acute{o}\acute{Y}\acute{u}\acute{Y} \gg \acute{n}\acute{A}$, $\check{C}\acute{e}\acute{I}$ $\gg \acute{n}\acute{n}\acute{a}\acute{n}^1 \acute{U}^3 \acute{e}\acute{a}\acute{o}\acute{U}$ $\acute{u}\acute{Y}\acute{Y}^3 \acute{n}\acute{I}\acute{i}\acute{a}\acute{o}\acute{U}$ \check{C}
 $i^3 \acute{n}^3 \mu Y\acute{a}\acute{o}\acute{U}\acute{A}$ $i^3 Y\acute{i}$ $\gg \acute{e}^3 \acute{I}^3 Y$ $\acute{B}\acute{a}\acute{I} \gg \acute{n}\check{C}$ $\acute{a}^3 \acute{n}^3 \cdot {}^3 \acute{U}\acute{a}\acute{o}\acute{U}$ $\acute{U}\acute{a}^1 \gg \acute{E}\check{C}$ ${}^1\check{C}\acute{Y}^3 \ddot{U}\check{C}\acute{I}$ $i^3 \acute{n}\acute{u}\acute{A}$ $\ddot{U}\check{C}^3 \acute{A}^3 \acute{U}^3 Y^3 \acute{I}$
 $\acute{I}^3 i^3 \acute{n}^3 \acute{E}\acute{a}\acute{i}$ $\acute{I}\acute{a}\acute{B}\acute{i}$ $\cdot \times \acute{I}\acute{a}\acute{o}\acute{Y}$ ${}^3 B\ddot{E}^3 i^3 i^3 \acute{n}\acute{o} \gg \acute{n}\acute{a}\acute{i}$ $\acute{U}\acute{a}^1 \gg \acute{E}\acute{Y} \gg \acute{n}\check{C}$ $\acute{N}^3 \acute{U} \gg \acute{U}^3 i^3 \acute{a}\acute{o}\acute{A}\acute{U}\acute{a}\acute{o}\acute{Y}$:

**2. $\acute{O}\acute{a}^1 \gg \acute{E}$ $\acute{u}\check{C}\acute{n}\acute{U}^3 Y \gg \acute{n}\check{C}$ $\cdot i^3 Y^3 \acute{U}\check{C}\acute{Y}$ $i^3 Y\acute{i}$ $\gg \acute{e}\acute{a}\acute{o}\acute{A}\acute{U}\acute{a}\acute{o}\acute{Y}\acute{Y} \gg \acute{n}\check{C}$ $i^3 \acute{n}\acute{u}\acute{A}$ $Y\acute{a}\acute{n}$
 $\gg Y\acute{A}^3 \acute{n}\acute{a}\acute{o}\acute{A}\acute{U}\acute{a}\acute{o}\acute{Y}\acute{Y} \gg \acute{n}\check{C}$ $\acute{a}^3 \acute{U}^3 Y\acute{Y} \gg \acute{n}\acute{a}\acute{o}\acute{U}$**

2.1. $\acute{u}\check{C}\acute{n}\acute{U}^3 Y \gg \acute{n}\acute{A}$, $\cdot \acute{a}\acute{n}\acute{I} \gg \acute{E}\acute{a}\acute{i}$ $\acute{U} \gg Y^3 B Y\acute{a}\acute{n}\acute{N}^3 \acute{U}\check{C}\acute{Y}$ $\acute{U}\acute{n}\acute{o}^3 \acute{I}\acute{o}^3 \acute{U}\check{C}\acute{Y}$ $\ddot{U}\check{C}\check{C}^3 i^3 \acute{U}\acute{a}\acute{o}\acute{U}$, ${}^3 \acute{n}\acute{i}$ ${}^3 \acute{n}\acute{a}\acute{o}\acute{U}$ $\gg Y$
 $i^3 \acute{n}\mu \gg \acute{n}^3 \acute{I}^3 \acute{I}^3 \acute{a}^3 \acute{n}^3 Y\acute{u}\acute{Y} \gg \acute{n}$: ${}^2 \acute{n}\acute{i}$ ${}^3 \acute{n}^3 \acute{I}^3 Y \ddot{U}\check{C}^3 \acute{I}$ $\cdot \acute{a}\acute{n}\acute{I} \acute{a}\acute{Y}\acute{A}$ ${}^3 B\ddot{E}^3 i^3 \acute{a}\acute{o}\acute{A}\acute{Y}$ \check{C} :

2.2. $i^3 Y^3 \acute{U}\check{C}\acute{Y}$ $i^3 Y\acute{i}$ $\gg \acute{e}\acute{a}\acute{o}\acute{A}\acute{U}\acute{a}\acute{o}\acute{Y}\acute{Y} \gg \acute{n}\acute{A}$ $\acute{e}\acute{a}^3 \acute{e}\acute{a}\acute{o}\acute{U}$ $\gg Y$ $i^3 \acute{n}\mu \gg \acute{n}^3 \acute{I}^3 \acute{I}^3$ ($\check{C}Y\acute{a}\acute{a} \gg \acute{e}$ $Y \gg \acute{n}\acute{u}\check{C}\acute{Y}$
 ${}^3 \acute{n}\acute{i}$ ${}^3 \acute{n}\acute{a}\acute{o}\acute{A}\acute{U}^3 Y$, ${}^3 \acute{U}\acute{Y}\acute{a} \gg \acute{e}$ $\check{C}\acute{E}$ $Y \gg \acute{n}\acute{U}\acute{a}\acute{o}\acute{I}^3 \acute{I}^3$) ${}^3 \acute{a}^3 \acute{n}^3 Y\acute{u}\acute{Y} \gg \acute{n}$ $\cdot {}^3 \acute{e}^3 \check{C}^3 \acute{n}\acute{I}\acute{a}\acute{o}\acute{U}$ ${}^3 B\ddot{E}^3 i^3 Y\acute{u}^3 \acute{U}\check{C}\acute{Y}$
 ${}^3 \acute{e}^3 Y\acute{o}\acute{Y}^3 \acute{N}^3 i^3 \acute{a}\acute{o}\acute{I}$ $\acute{I}^3 \acute{e}^3 \acute{U}\acute{a}\acute{o}\acute{A}\acute{U}\acute{a}\acute{o}\acute{Y}\acute{Y} \gg \acute{n}$ ${}^3 B\ddot{E}^3 i^3 \acute{B}\acute{a}\acute{o}\acute{I}^3 \acute{U}\acute{a}\acute{o}\acute{U}$ $\acute{O}^3 \acute{i}\acute{a}\acute{n} \gg \acute{E}\acute{a}\acute{i}$ $\acute{U} \gg Y^3 B Y\acute{a}\acute{n}\acute{N}^3 \acute{U}\check{C}\acute{Y}$
 $\acute{U}\acute{n}\acute{o}^3 \acute{I}\acute{o}\acute{a}\acute{o}\acute{A}\acute{U}\acute{a}\acute{o}\acute{Y}$ ($\acute{e}^3 \acute{N}\acute{U}^3 Y\acute{a}\acute{o}\acute{U}$ $\gg Y$ ${}^3 B\ddot{E}^3 i^3 i^3 \acute{n}\acute{o} \gg \acute{n}$):

2.1. $\acute{u}\check{C}\acute{n}\acute{U}^3 Y \gg \acute{n}$

$i^3 Y\acute{i}$ $\gg \acute{e}\acute{a}\acute{o}\acute{A}\acute{U}\acute{a}\acute{o}\acute{Y}\acute{a}\acute{o}\acute{U}$ $\acute{I}^3 Y$ $\acute{U} \gg Y^3 B Y\acute{a}\acute{n}\acute{N}^3 \acute{U}\check{C}\acute{Y}$ $\acute{U}\acute{n}\acute{o}^3 \acute{I}\acute{o}^3 \acute{U}\check{C}\acute{Y}$ ${}^1 \acute{B}\acute{i}$ $\acute{a}\acute{o}\acute{U}$ $\cdot \acute{a}\acute{n}\acute{I} \acute{a}\acute{o}$ $Y\acute{U}^3 Y^3 i^3 \check{C}\acute{a}$
 $\mu^3 \frac{1}{2} \check{A}\check{C}\acute{i}$ $\acute{y}\check{C}\acute{n}\acute{U}^3 Y \gg \acute{n}$, $\acute{a}\acute{n}\acute{a}\acute{Y}\acute{o}\acute{C}\acute{o}$ $\acute{U}\acute{a}\acute{o}\acute{n}^3 \acute{u}^3 Y\acute{a}\acute{U}\acute{a}\acute{o}\acute{n}\acute{Y}$ ${}^3 \acute{n}\acute{i}$ ${}^3 \acute{n}\acute{a}\acute{o}\acute{U}$ \check{C} $i^3 \acute{n}\mu \gg \acute{n}^3 \acute{I}^3 \acute{I}^3 \acute{a}^3 \acute{n}^3 Y\acute{u}$: $i -$
 $\acute{n}^1 \acute{y}\check{C}\acute{n}\acute{U}^3 Y$ ($i \in [0,1]$) ${}^3 \acute{n}\acute{i}$ ${}^3 \acute{n}\acute{a}\acute{o}\acute{U}$ \check{C} $i - \acute{n}^1$ ${}^3 \acute{a}^3 \acute{n}^3 Y\acute{u}\acute{A}$ $\acute{N}^3 i^3 \cdot \acute{U}^3 \acute{E}^3 \acute{n}\acute{i}$ ${}^3 \acute{n}^3 \acute{I}^3 Y$ $\acute{y}\acute{a}\acute{o}\acute{Y}\acute{i}\acute{o}\check{C}^3 \acute{U}\acute{a}\acute{i}$.

$$Y_t(i) = A_t N_t(i), \tag{1}$$

$\acute{a}\acute{n}\acute{i}$ $\gg \acute{O}$ $Y_t(i) - Y$ $i - \acute{n}^1$ $\mu^3 \acute{n}\check{C}\acute{u}\check{C}$ ${}^3 \acute{n}\acute{i}$ ${}^3 \acute{n}\acute{a}\acute{o}\acute{A}\acute{U}^3 Y$ $\acute{I}^3 \acute{I}^3 \acute{E}\acute{Y}$ \check{C} , $\check{C}\acute{e}\acute{I}$ $A_t - Y$ ${}^3 \acute{n}\acute{i}$ ${}^3 \acute{I}\check{C}\acute{Y}$
 $i \gg \acute{E}\acute{Y}\acute{a}\acute{E}\acute{a}$. $\check{C}^3 \acute{I}^3 Y$ $\acute{a}^3 \acute{n}^3 \acute{U} \gg i$ $\acute{n}\acute{A}$:

² ${}^2 \acute{U}\acute{Y}$ $\acute{N}^3 i^3 \acute{e}^3 \acute{n}\acute{a}\acute{o}\acute{U}\acute{Y} \gg \acute{n}\check{C}\acute{Y}$, $\acute{a}\acute{n}\acute{a}\acute{Y}\acute{o}$ ${}^1 \acute{a}\acute{o}\acute{n}\acute{e}\mu \gg \acute{n}\acute{a}\acute{o}\acute{U}\acute{A}$ $\acute{a}\check{C}$ $Y \gg \acute{n}\acute{I}^3 \acute{U}^3 \acute{o}\acute{i}\acute{a}\acute{o}\acute{U}$ $\cdot \acute{a}\check{C}$ $\acute{U} \gg \acute{I}^3 \mu^3 Y\acute{i}\acute{a}\acute{o}\acute{U}$ ${}^1 \acute{n}^3 Y\acute{o}$
 $i^3 Y\acute{i}$ $\gg \acute{e}^3 \cdot \check{C}\acute{i}$ ${}^3 \acute{I}^3 Y$ $\acute{m}\acute{a}\acute{i}$ ${}^3 Y\acute{i}^3 \acute{I}\acute{a}\acute{o}\acute{A}\acute{U}\acute{a}\acute{o}\acute{Y}\acute{A}$, $\acute{I}^3 \acute{n}^3 \gg \acute{E}\check{C}$ \check{C} $\acute{U}^3 Y\acute{n}^3 \acute{U}^3 \acute{e}\acute{Y}$ $\acute{I}^3 Y\acute{a}\acute{A}^3 Y^3 \acute{E}$ [1]- $\acute{a}\acute{o}\acute{U}$:

Üß»Ýù, áñ³ ññ³ ¹ñ³ Í³ Ý ýáoÝÍóÇ³ ÜÇ ì »èuáò ÷ á÷ áÈáóÃÜáóÝ áñ³ (Ñ³ Ù³ Ù³ ì³ Í³ [1]-Ç Ñ³ ì³), è³ Í³ ÜÝ Ýáñ »ÝÃ³ ¹ñáóÃÜ³ Ý á³ Û³ ÝÝ»ñáó Ñ_t(i)-Ý (i-ñ¹ ýÇñÜ³ ÜÇ ÍáóÜÇó ù· ì³ · áñÍ í áó ßÈ³ ì³ áóÃ)³ ñ¹»Ý ì³ ñí áó ì³ (2) ì³ »èuáí.

$$N_t(i) = \left[\int_0^1 N_t(i, j)^{1-\frac{1}{e_w}} dj \right]^{\frac{e_w}{e_w-1}} \quad j \in [0,1], \quad (2)$$

áññ ï ð Ñ_t(i, j)-Ý i-ñ¹ ýÇñÜ³ ÜÇ ÍáóÜÇó t-Ã³ Ù³ Ý³ Í³ Ñ³ ì³ í³ Íáó ì³ ñó³ Í³ È³ Í³ j ì³ »è³ ÍÇ³ ßÈ³ ì³ áóÃÇ ù³ Ý³ ÍáóÃÜáóÝÝ ì³ (Í³ Ù³ ßÈ³ ì³ í³ Á³ Ù³ Ý³ ÍÁ), ÇèÏ e_w > 1-Á³ è³ ÝÓÇÝ³ ßÈ³ ì³ Ýù³ ÜÝ³ Í³ è³ ÜáóÃÜáóÝÝ»ñÇ ÜÇÇ· ÷ áÈ³ ñÇÝÜ³ Ý³ è³ Ó· ì³ ÝáóÃÜáóÝÁ (³ ßÈ³ ì³ áóÃÇ ì³ ñµ»ñ³ Í³ ÍáóÃÜ³ Ý³ èÏ Ç×³ ÝÁ):

°ñµ e_w → ∞, (2)-Á èÏ³ Ýáó ì³ ì³ Ñ_t(i) = $\left[\int_0^1 N_t(i, j) dj \right]$ ì³ »èuÁ: ² Û¹ ¹ »à uáó ì³

³ ßÈ³ ì³ Ýù³ ÜÝ³ Í³ è³ ÜáóÃÜáóÝÝ»ñÁ ¹³ éÝáó Ù³ Ý³ Í³ ì³ ñ»È³ á»è ÷ áÈ³ ñÇÝ»ÈÇ, ³ ÜÈÈ áèuáí ì³ Ý³ ÜÝ³ ì³ Ýì »éáóÃÜáóÝÝ»ñÁ, ³ è³ Ç³ ññ»Èáí · ñ»Ã» ÝáóÜÝ³ ßÈ³ ì³ Ýù³ ÜÝ³ Í³ è³ ÜáóÃÜáóÝÁ, ³ ßÈ³ ì³ ÝùÇ ááóÏ³ Üáó Ù³ Ý³ ßÝáñÑ³ ÜÝ³ áóÃ á»Ý áóÝ»Ýáó Ù³, · i-ñ¹ ýÇñÜ³ Ý³ ññ³ ¹ñ³ ÝùÁ Ááó³ ññ»ÈÇè (1)-áó ù· ì³ · áñÍ áó ì³ ááóÏ³ Üáó Ù³ ññ³ Ù³ óí³ Í³ µáññ³ ßÈ³ ì³ Ýù³ ÜÝ³ Í³ è³ ÜáóÃÜáóÝÝ»ñÁ³ è³ Ýó ì³ ñµ»ñ³ Í³ Ù³ Ý³ (ÜÇ· ÝáóÜÝ³ ÍßÇéÝ»ñáí):

² ßÈ³ ì³ í³ ñó»ñÁ è³ ÑÜ³ Ýáó Ù³ »Ý³ ßÈ³ ì³ áóÝ»ñÁ, ÇèÏ ýÇñÜ³ Ý»ñÁ` ÁÝ¹ áóÝáó ãñà »è ì³ ñí³ Í³ Ù³ ÍáóÃÜáóÝ: ì³ ñí³ Í³ ßÈ³ ì³ í³ ñó»ñÇ ¹ »à uáó ì³ ýÇñÜ³ Ý»ñÇ Í³ Èè»ñÇ ÜÇÝÇÜ³ È³ óÜ³ Ý ÈÝ¹ÇñÁ ÍÈÝÇ (w_t(j)-áí Ýß³ Ý³ Í³ Í³ ì³ j (j ∈ [0,1]) ì³ »è³ ÍÇ³ ßÈ³ ì³ áóÃÇ ¹ÇÜ³ óí³ ñó³ ì³ ñáóÃÜáóÝÁ t-Ã³ Ù³ Ý³ Í³ Ñ³ ì³ í³ Íáó Ù³).

$$\min_{N_t(i,j)} F(N_t(i, j)) = \min_{N_t(i,j)_0} \int W_t(j) N_t(i, j) dj$$

á³ Û³ Ýáí, áñ

$$N_t(i) = \left[\int_0^1 N_t(i, j)^{1-\frac{1}{e_w}} dj \right]^{\frac{e_w}{e_w-1}}$$

ÈáóÏ³ Èáí Ó·³ Í³ ñáí³ Í³ Í³ Èè»ñÇ ÜÇÝÇÜ³ È³ óÜ³ Ý ÈÝ¹ÇñÁ (ì³ ñí³ Í³ ßÈ³ ì³ í³ ñóÇ á³ Û³ ÝÝ»ñáó Ù³) ì³ ñ»ÈÇ ì³ èÏ³ Ý³ È³ j-ñ¹³ ßÈ³ ì³ áóÃÇ ÝÍ³ ì³ Ù³ Ùµ i-ñ¹ ýÇñÜ³ ÜÇ ÍáóÜÇó Ý»ññ³ Ù³ óí³ áó á³ Ñ³ ÝÇ³ ññÇ ýáoÝÍóÇ³ Ý.

$$N_t(i, j) = \left(\frac{W_t(j)}{W_t} \right)^{-e_w} N_t(i), \quad \text{Í³ Ù³ Ù³ Í³ Ý³ } i, j \in [0,1] \text{ -Ç Ñ³ Ù³ ñ} \quad (3)$$

áññ ï ð e_w-Ý á³ Ñ³ ÝÇ³ ññÇ³ è³ Ó·³ ì³ ÝáóÃÜáóÝÝ ì³, ÇèÏ w_t-áí Ýß³ Ý³ Í³ Í³ ì³ ì³ Ù³ µáóÇ³ Í³ Ý

³ ßÈ³ ì³ í³ ñó»ñÇ ÇÝ¹ »èuÁ w_t ≡ $\left[\int_0^1 W_t(j)^{1-e_w} dj \right]^{\frac{1}{1-e_w}}$:

(3)-Y, Aei çáoĀŮ³ Y, Y»ñĪ³ Ů³ óYáòŮ ç á³ Ñ³ Yç³ ñĪÇ ũñ»YúÁ. ³ ŨĒ³ í³ ë³ ñ á³ Ũ³ YÝ»ñáòŮ j-
 ñ¹³ ßĒ³ í³ Yù³ ŨÝ é»eáòñëÇ í³ ñÓ³ ï ñáoĀŮ³ Y³ ×Á µ»ñáòŮ ç ï íŮ³ É é»eáòñëÇ Ñ³ Y¹»à ï-ñ¹
 ýÇñŮ³ Ũ Ī áòŮŮçó Y»ñĪ³ Ů³ óí áò á³ Ñ³ Yç³ ñĪÇ Īñ×³ ï Û³ Y (»ñµ W_{t(j)} ↑, ³ á³ N_{t(i,j)} ↓):
 ² ŨàÇëáí, ³ ßĒ³ í³ YùÇ ßáoĪ³ ŨáòŮ ³ é³ ç³ ñĪí áò ³ ßĒ³ í³ Yù³ ŨÝ Ī³ é³ ŨáŮĀŮáòYÝ»ñÁ
 ï³ ñµ»ñ³ Īí³ Ī »Y, ³ ñĪ³ ¹ñáoĀŮ³ Y ÁYĀ³ óúáòŮ ũ· ï³ · áñĪí áòŮ »Y³ ßĒ³ í³ Yù³ ŨÝ µáĕñ
 Ī³ é³ ŨáŮĀŮáòYÝ»ñÁ, áñáYó ù³ Y³ ĪÁ áñáBí áòŮ ç á³ Ñ³ Yç³ ñĪÇ ýáoYĪóÇ³ Ũ ŨÇçáoái`
 á³ Ũ³ Yái, áñ í³ ñÓ³ ï ñáoĀŮáòYÁ ĪáyĪñ»ï ³ ßĒ³ í³ Yù³ ŨÝ Ī³ é³ ŨáŮĀŮ³ Y ¹ÇŮ³ ó³ ñ¹»Y³
 ë³ ÑŮ³ Y»Éç ³ ŨÝ³ é³ ç³ ñĪ áò ï Y³ ŨÝ ï Yï »eáòĀŮáòYÁ:

2.2. í Y³ ŨÝ ï Yï »eáòĀŮáòYÝ»ñ

í Yï »eáòĀŮáòYáòŮ Ī³ Y µ³ ¼Ů³ ĀÇí ŨÇ³ ï »ë³ Ī ï Y³ ŨÝ ï Yï »eáòĀŮáòYÝ»ñ:
 Ũ»ñĪ³ Ů³ óáòá³ Ī³ Y j-ñ¹ ï Y³ ŨÝ ï Yï »eáòĀŮáòYÁ (j ∈ [0,1]) ³ é³ í»É³ · áòŨÝÇ ç Ñ³ eóYáòŮ
 Ī»Yë³ Á³ Ũ³ Y³ Ī³ ßñç³ YÇ ũ· ï³ Ī³ ñáoĀŮ³ Y ýáoYĪóÇ³ ŨÝ Y»ñĪ³ ³ ñÁ»ùÁ.

$$E_t \left\{ \sum_{k=0}^{\infty} b^k U(C_{t+k}(j), N_{t+k}(j)) \right\}, \quad (4)$$

áñĪ »Ů U -Y ũ· ï³ Ī³ ñáoĀŮ³ Y ýáoYĪóÇ³ Y ç, C_t-Y · N_t-Y t á³ ÑÇÝ Ñ³ Ũ³ á³ ï³ ëĒ³ Y³ µ³ ñ
 eá³ éŮ³ Y ÇÝ¹»èĀ · ³ ßĒ³ í³ áòĀÇ³ é³ ç³ ñĪÁ, ÇëĪ b -Y (0 < b < 1) ¼Ů³ ñáoŮŮÝ ç:

óYÁ³ ¹ñí áòŮ ç, áñ eá³ éŮ³ Y³ ×Á µ»ñáòŮ ç ũ· ï³ Ī³ ñáoĀŮ³ Y³ ×Ç, ÇëĪ
 ³ ßĒ³ í³ Á³ Ũ³ Y³ ĪÇ Ũ»Ī³ óáòŮÁ ÁY¹Ñ³ Ī³ é³ ĪÁ Īñ×³ ï áòŮ (U'_C > 0, U'_N < 0): ³ óÇ³ Ů¹,
 »YĀ³ ¹ñí áòŮ ç, áñ ũ· ï³ Ī³ ñáoĀŮ³ Y ýáoYĪóÇ³ Y · á·³ í áñ ç. »ñĪñáñ¹ Ī³ ñ· Ç³ Ī³ YóŮ³ ÉY»ñÇó
 µ³ ŮĪ³ ó³ Ī Đ»eëÇ Ũ³ ï ñÇóÁ µ³ ó³ ë³ Ī³ Y áñáBŮ³ É ç (U(·)-Y ĪñĪY³ ĪÇ ¹Çý»ñ»Yó»Ēç ç, ÇëĪ 2-
 ñ¹ Ī³ ñ· Ç³ Ũ³ eY³ ĪÇ³ Ī³ YóŮ³ ÉY»ñY³ YÁY¹Ñ³ ï »Y):

Ũ»ñĪ³ Ů³ óáòá³ Ī³ Y ï Y³ ŨÝ ï Yï »eáòĀŮ³ Y í³ ñùÁ, »ñµ Ũñó³ Ī óáòĀŮáòYÁ
 ³ ßĒ³ í³ ßáoĪ³ ŨáòŮ Ī³ ï³ ñŮ³ É ç, ÇëĪ ³ ßĒ³ í³ í³ ñÓ»ñÁ ×Ī áòY, Ñ»ï · Ů³ ÉY ç`
 ³ é³ í»É³ · áòŨÝÇ Ñ³ eóY»É(4)-Á á³ Ũ³ Yái, áñ į »ŮÇ áòÝÇ µŨáòç»ï³ ŨÝ³ ë³ ÑŮ³ ÷³ Ī áòŮÁ.

$$P_{t+k} C_{t+k} + E_{t+k} \{ Q_{t+k,t+k+1} D_{t+k+1} \} \leq D_{t+k} + W_t N_{t+k} + T_{t+k}$$

áñĪ »Ů P_{t+k} -Y ÁY¹Ñ³ Yáòñ · Y»ñÇ ÇÝ¹»èĀ ç, Q_{t+k,t+k+1} -Á t+k+1 Á³ Ũ³ Ī³ Ñ³ ï í³ ĪÇ á áñĪ ý»Ēç
 ³ Yí³ Y³ Ī³ Y³ ñÁ»ùÁ t+k á³ ÑÇ Y»ñĪ³ ³ ñÁ»ùái³ ñĪ³ Ñ³ ŨĪ »Ēá · áñĪ³ ĪÇóY ç (1/(1+i_t)),
 D_{t+k} -Y ï Y³ ŨÝ ï Yï »eáòĀŮ³ Y Y»ñ¹ñáòŮ³ ŨÝ á áñĪ ý»Ēç³ Yí³ Y³ Ī³ Y³ ñÁ»ùY ç t+k á³ ÑÇÝ
 [Y»ñ³ éŮ³ É (t+k)-á³ ÑÇÝ ëĪ³ óí áò ï áĪáë³ í×³ ñY»ñÁ], ÇëĪ T_{t+k} -Y Ī³ é³ í³ ñáoĀŮ³ Y
 Ī áòŮŮçó ï ñí áò ŨÇ³ Y. ³ ŨŮ³ ¼áòĪ ï ñ³ Yéy»ñĪ Y»ñY »Y:

Ů³ ùëÇŮáòŮŮç³ Yññ³ Á»Bí (µ³ í³ ñ³ ñ á³ Ũ³ YÁ ï »ŮÇ áòÝÇ ũ· ï³ Ī³ ñáoĀŮ³ Y ýáoYĪóÇ³ Ũ
 · á·³ í áñáoĀŮ³ Y í»ñ³ µ»ñŮ³ É³ ñĪ³ Ī »YĀ³ ¹ñáoĀŮ³ Y BÝáñÑÇí) á³ Ũ³ YÝ ç.

$$\begin{cases} \frac{U'_{C_t}}{P_t} = b(1+i_t)E_t \left\{ \frac{U'_{C_{t+1}}}{P_{t+1}} \right\} & (5.1) \\ -\frac{U'_{N_t}}{U'_{C_t}} = \frac{W_t}{P_t} & (5.2) \end{cases} \quad (5)$$

Ü»ñí³ Û³ óí»ó Ì³ ì³ ñÛ³ É Ùñó³ Í óáóÃÛ³ Ý ¹»àúáò ì Ý³ ÛÇÝ ì Ýì »éáóÃÛ³ Ý í³ ñù³ · ÇÍÁ (ì »'ë [1]): Ðá¹³ Í áò Û³ ñí³ Í »ÝÃ³ ¹ñáóÃÛáóÝÝ»ñÁ ÷ á÷ áË áóóÃÛáóÝÝ»ñ »Ý Ùì óÝáò ÑÝáà»ë ÝÍ³ ñ³ · ñí³ Í ËÝ¹ñÇ ¹ñí³ Í áò Ù, ³ ÛÝà»ë ÷ È ëì³ óí áó ñ¹ ÛáóÝùÝ»ñáò Ù: [1]-Ç ÝÍ³ ì³ Ù³ Ùµ ì³ ñµ»ñáóÃÛáóÝÁ Ñ»ì Û³ É»ÝÃ³ ¹ñáóÃÛáóÝÝ»ñÝ »Ý.

1. j -ñ¹ ì Ý³ ÛÇÝ ì Ýì »éáóÃÛáóÝÁ Ù³ èÝ³ · Çì³ ó³ Í ÷ j ³ ÒË³ ì³ ÝùÇ Ù»Ç ($j \in [0,1]$):

³áóñ³ ù³ ÝáÛáóñ ì Ý³ ÛÇÝ ì Ýì »éáóÃÛáóÝ³ ÒË³ ì³ ÒáóÍ³ Ûáò ñáóÝÇ Ù»Ý³ ÒÝáñÑ³ ÛÇÝ áóÁ, áñÇ³ èÍ³ ÛáóÃÛáóÝÁ ÑÝ³ ñ³ íáñáóÃÛáóÝ ÷ ì³ ÈÇè³ ÒË³ ì³ Ýù³ ÛÇÝ à³ Û³ Ý³ · Çñ ÌÝù»ÈÇè è³ ÑÛ³ Ý»É³ Ýí³ Ý³ Ì³ Ý³ ÒË³ ì³ ñó»ñÇ Çñ Ñ³ Ù³ ñ ÁÝ¹áóÝ»ÈÇ Ù³ Ì³ ñ¹³ Ì:

2. ÒË³ ì³ ì³ ñó»ñÇ × Ò · ñì Ù³ Ý Ñ³ ×³ È áóóÃÛ³ Ý íñ³ ¹ñí³ Í ÷ Ì³ È á ì ÇàÇ è³ ÑÛ³ Ý³ ÷³ Í áò Ù: Ò Ù¹ ¹»àúáò ù³ è³ ÝÓÇÝ ì»ñóñ³ Í Ûáóñ³ ù³ ÝáÛáóñ ì Ý³ ÛÇÝ ì Ýì »éáóÃÛáóÝ ÙÇÒì ñ, áñ áóÝ»Ýáò ÷ ÒË³ ì³ ì³ ñó»ñÇ è³ ÑÛ³ ÝÙ³ Ý ÑÝ³ ñ³ íáñáóÃÛáóÝ, ÇèÌ ÝÙ³ Ý ÑÝ³ ñ³ íáñáóÃÛáóÝ áó»Ý³ Èáò Ñ³ ì³ Ý³ Ì³ ÝáóÃÛáóÝÁ (1- q_w) ÷ (q_w -Ý Á³ Ù³ Ý³ ÌÇ Ûáóñ³ ù³ ÝáÛáóñ à³ ÑÇ óáóÙ ÷ ì³ ÈÇè³ ÒË³ ì³ ì³ ñó»ñÁ ñ× Ò · ñì áó ì Ý³ ÛÇÝ ì Ýì »éáóÃÛáóÝÝ»ñÇ ì »è³ Ì³ ñ³ ñ ÌÇÇéÁ ÁÝ¹Ñ³ ÝáóñÇ Ù»Ç):

1.-ÇÝ »ÝÃ³ ¹ñáóÃÛ³ Ý³ ì³ È³ óáòÙÁ ì Ý³ ÛÇÝ ì Ýì »éáóÃÛ³ Ý ËÝ¹ñáò ÷ á÷ áË áóóÃÛáóÝ ÷ ò³ è³ Ç³ óÝáò Ù. ù · ì³ Ì³ ñáóÃÛ³ Ý Ù³ ùèÇÛ³ È³ óáòÙÁ Ì³ ì³ ñí áò Ù ÷ Ñ³ Òí Ç³ èÝ»Èáí áá ÙÇ³ ÛÝ µÛáóç»ì³ ÛÇÝ è³ ÑÛ³ Ý³ ÷³ Í áò ÙÁ, ³ ÛÈ · Çñ ÒË³ ì³ áóÁ è»éáóñèÇ ÝÍ³ ì³ Ù³ Ùµ ÒáóÍ³ Ûáò ù³ èÍ³ à³ Ñ³ ÝÇ³ ñíÁ (Ù»Ý³ ÒÝáñÑ³ ÛÇÝ Ùñó³ Í óáóÃÛáóÝ).

$$\max_{C_t, W_t^*, D_{t+1}} E_t \left\{ \sum_{k=0}^{\infty} b^k U(C_{t+k}(j), N_{t+k}(j)) \right\}$$

$$P_{t+k} C_{t+k}(j) + E_{t+k} \{ Q_{t+k, t+k+1} D_{t+k+1} \} \leq D_{t+k} + W_t^* N_{t+k}(j) + T_{t+k}$$

$$N_{t+k}(j) = \left(\frac{W_t^*}{W_{t+k}} \right)^{-e_w} N_{t+k} \quad k = 0, 1, 2, \mathbf{K}$$

Ø³ ùèÇÛ³ È³ óáòÙÁ Ì³ ì³ ñí áò Ù ÷ Áèì C_t, W_t^*, D_{t+1} ÷ á÷ áË È³ Ì³ ÝÝ»ñÇ: è³ ÒË³ ì³ ÝùÇ ÒáóÍ³ Ûáò Ù»Ý³ ÒÝáñÑ³ ÛÇÝ Ùñó³ Í óáóÃÛ³ Ý · × Ì áóÝ³ ÒË³ ì³ ì³ ñó»ñÇ ¹»àú ÷ ÷: Ò³ Ì³ ñáí³ Í ËÝ¹ñÇ ÈáóÍ Ù³ Ý à³ ñ³ · Ûáò Ì³ ñ»ÈÇ ÷ Ñ³ Ùá½á »É áñ Ù³ ùèÇÛáò ÙÇ³ ÝÑñ³ Á»Òì à³ Û³ ÝÝ»ñÇ³ ¼Û»ñÇ Ñ³ ì³ è³ ñáòÙÁ à³ Ñá³ Ýí áò Ù ÷ (5.1), è³ Ì³ ÛÝ ÷ áË í áò Ù ÷ èá³ èÙ³ Ý · ÒË³ ì³ áóÁÇ ÷ áË ñÇÝÙ³ Ý Ý»ñÁ³ Ù³ Ý³ Ì³ ÛÇÝ à³ Û³ ÝÁ (5.2) Ñ³ Ý · »óÝ»Èáí ÒË³ ì³ ì³ ñó»ñÇ Ù³ Ì³ ñ¹³ Í áò Ù Ñ³ ì³ È³ ¹ñÇ³ è³ Ç³ óÙ³ Ý

$$\frac{W_t^*}{P_t} = -M_w \frac{U'_{N_t}}{U'_{C_t}} \equiv M_w MRS_t, \quad (6)$$

áñi »ō $M_w \equiv \frac{e_w}{e_w - 1}$ » ßË³ i³ i³ ñó»ñÇ Ñ³ í»É³ ¹ÇñÝ ç: Ð³ í»É³ ¹ñÇ » é³ ç³ óáòÙÁ Û»Ý³ ßÝáñÑ³ ÛÇÝ Ûñó³ Í ó³ ÛÇÝ ÛÇç³ í³ ÛñÇÝ µÝáñáb Ñ³ í Ì áóÃÛáóÝ ç (³ í»ÉÇ µ³ ñÓñ · ÇÝ, ³ í»ÉÇ ó³ Í ñ ù³ Ý³ Ì áóÃÛáóÝ):

°ñµ Ûñó³ Ì áóÃÛáóÝÁ Û»Ý³ ßÝáñÑ³ ÛÇÝ ç, ÇëÏ » ßË³ i³ i³ ñó»ñÁ Ì áßì (ì »ÖÇ áóÝ»Ý ÛÇ³ Á³ Û³ Ý³ Ì 1. .. 2. »ÝÁ³ ¹ñáóÃÛáóÝ»ñÁ), » á³ ÈÝ¹ñÇ ÉáóÏ Û³ Ý³ Ýññ³ Á»ßì á³ Û³ ÝÝ»ñÇó Û»ÌÁ´ èá³ èÛ³ Ý áñábÛ³ Ý ¼Û»ñÇ ÛÇçÁ³ Û³ Ý³ Ì³ ÛÇÝ á³ Û³ ÝÁ (5.1) ÌñÏÇÝ á³ Ñá³ Ýí áóÛ ç, è³ Ì³ ÛÝ³ ßË³ i³ i³ ñó»ñÇ áñábÛ³ Ý ÈÝ¹ÇñÁ ÛÇ ÷ áùñ ÷ áÈí áóÛ ç: ² Û¹ ¹»á úáòÛ áñáÝí áóÛ ç

$$\max_{W_t^*} E_t \left\{ \sum_{k=0}^{\infty} (bq_w)^k U(C_{t+k|t}, N_{t+k|t}) \right\}, \quad (7)$$

á³ Û³ Ýáí, áñ

$$P_{t+k} C_{t+k|t} + E_{t+k} \{ Q_{t+k,t+k+1} D_{t+k+1|t} \} \leq D_{t+k|t} + W_t^* N_{t+k|t} + T_{t+k}$$

$$N_{t+k|t} = \left(\frac{W_t^*}{W_{t+k}} \right)^{-e_w} N_{t+k} \quad k = 0, 1, 2, \mathbf{K}$$

áñi »ō $C_{t+k|t} \dots N_{t+k|t}$ -Ý Ñ³ Û³ á³ í³ èË³ Ý³ µ³ ñ³ ÛÝ ì Ý³ ÛÇÝ ì Ýí »éáóÃÛ³ Ý èá³ éáòÙÁ .. » ßË³ i³ áóÃÇ³ é³ ç³ ñíÝ ç (t+k) á³ ÑÇÝ, áñÁ í»ñÇÇÝ³ Ý. » Û ×ß. ñì »É ç ßË³ i³ i³ ñó»ñÁ t á³ ÑÇÝ (· ñ³ éáòÙÝ»ñÇ á³ ñ¹áóÃÛ³ Ý Ýá³ í³ Ì áí³ Ûëì »ō .. » ÛéáóÑ»ì .. » Ýí »éáòÛ »Ýù ì Ý³ ÛÇÝ ì Ýí »éáóÃÛ³ ÝÁ óáòÛ ì í áó j Ñ³ Û³ ñÁ): $N_{t+k} \equiv \int_0^1 N_{t+k}(i) di$ -áí Ýß³ Ý³ Ì í³ Í ç » Ûµáóç³ Ì³ Ý ¼µ³ Õì³ Ì áóÃÛáóÝÁ (t+k) -á³ ÑÇÝ, $D_{t+k|t}$ -Ý (t+k) á³ ÑÇÝ ì Ý³ ÛÇÝ ì Ýí »éáóÃÛ³ Ý Ý»ñ¹ñáòÛ³ ÛÇÝ á áñì ý»ÉÇ » Ýí³ Ý³ Ì³ Ý³ ñÁ»ùÝ ç ` Ó»èù µ»ñí³ Í ì í Û³ É Á³ Û³ Ý³ Ì³ Ñ³ ì í³ Í ç èÏ¼µÇÝ³ ÛÝ ì Ý³ ÛÇÝ ì Ýí »éáóÃÛ³ Ý Ì áóÛÇó, áñÁ í»ñÇÇÝ³ Ý. » Û ×ß. ñì »É ç Çñ » ßË³ i³ i³ ñó»ñÁ t -á³ ÑÇÝ, ÇëÏ $E_{t+k} \{ Q_{t+k,t+k+1} D_{t+k+1|t} \}$ -Ý (t+k+1) á³ ÑÇÝ $D_{t+k+1|t}$ á³ ì³ Ñ³ Ì³ Ý³ »Ï³ Ûáòì µ»ñáó á áñì ý»ÉÇ ßáóÏ³ Û³ Ì³ Ý³ ñÁ»ùÝ ç (t+k) á³ ÑÇÝ:

Ð³ ñí ç Ýß»É áñ Ó³ Ì »ñáí³ Í ÈÝ¹ÇñÁ (7) ÉáóÏ áóÛ »Ý áá µáññ ì Ý³ ÛÇÝ ì Ýí »éáóÃÛáóÝ»ñÁ, » Û ÛÇ³ ÛÝ Ýñ³ Ýù, áñáÝù ¹Çì³ ñí í áó t -á³ ÑÇÝ áóÝ»Ý » ßË³ i³ i³ ñó»ñÇ ×ß. ñì Û³ Ý ÑÝ³ ñ³ í áñáóÃÛáóÝ: ÁÝ¹ áñáóÛ, » ßË³ i³ i³ ñóÇ Û³ Ì³ ñ¹³ ÍÁ è³ ÑÛ³ Ýí áóÛ ç » ÛÝá»è, áñ Û³ ùèÇÛ³ É³ óíÇ èá³ èí áó ù. ì³ Ì³ ñáóÃÛ³ Ý Ý»ñí³ » ñÁ»ùÁ, áñÁ ì Ý³ ÛÇÝ ì Ýí »éáóÃÛáóÝÁ èì³ ÝáòÛ ç, »ñµ » ßË³ i³ i³ ñó»ñÁ ÛÝáòÛ »Ý³ Ý ÷ á ÷ á È´ á³ Ñá³ Ýí »Éáí W_t^* -Û³ Ì³ ñ¹³ Ì áóÛ è³ ÑÛ³ Ýí³ Í ÁÝÁ³ óÇÏ Á³ Û³ Ý³ Ì³ Ñ³ ì í³ Í áóÛ: (t+k) á³ ÑÇÝ ì Ý³ ÛÇÝ ì Ýí »éáóÃÛ³ Ý

$\beta \dot{E}^3 i^3 i^3 \dot{n} \dot{O} \gg \dot{n} \dot{C} \quad 1^3 \dot{Y}^3 \dot{O} \quad 3 \dot{n} \dot{O}^3 \cdot 3 \dot{Y} \dot{U} \dot{C} \dot{Y} \quad \dot{C} \quad \dot{a}^3 i^3 \quad 3 \dot{e} \dot{E}^3 \dot{Y} \quad \dot{N}^3 i^3 \gg \dot{E}^3 1 \dot{n} \dot{C} \quad \beta \gg \dot{O} \dot{U}^3 \dot{Y} \dot{A} \quad (I_w - \dot{Y} \dot{Y} i^3 \frac{1}{2} \dot{a} \dot{O} \dot{U} \quad \dot{J} : \dot{I}^3 \dot{U} \dot{n}^3 \dot{N} \gg \dot{O} \quad 1 \gg \dot{a} \dot{u} \dot{a} \dot{O} \dot{U} \quad q_w = 1 \Rightarrow I_w = 0. \dot{I}^3 \dot{U} \dot{a} \dot{O} \dot{Y} \quad i^3 \times^3 \dot{I} \dot{C} \dot{O} \dot{N}^3 i^3 \gg \dot{E}^3 1 \dot{n} \dot{C} \quad \beta \gg \dot{O} \dot{a} \dot{O} \dot{U} \dot{A} \quad \dot{a} \dot{n} \dot{J} \dot{I} \gg \dot{n} \dot{a} \quad \dot{a} \dot{C}^3 \frac{1}{2} \dot{a} \dot{O} \dot{U} \quad 3 \beta \dot{E}^3 i^3 i^3 \dot{n} \dot{O} \gg \dot{n} \dot{C} \quad \dot{C} \dot{Y} \dot{Y} \dot{E} \dot{U}^3 \quad \dot{O} \dot{C}^3 \dot{U} \dot{C} \quad i^3 \dot{n}^3 :$
 $q_w - \dot{C} \quad \div \quad \dot{a} \dot{u} \dot{n} \quad 3 \dot{n} \dot{A} \gg \dot{u} \dot{Y} \gg \dot{n} \dot{C} \quad 1 \gg \dot{a} \dot{u} \dot{a} \dot{O} \dot{U} \quad \dot{a} \dot{O} \dot{Y} \gg \dot{Y} \dot{a} \dot{O} \dot{U} \quad \gg \dot{Y} \dot{u} \quad \times \dot{I} \dot{a} \dot{O} \dot{Y} \quad 3 \beta \dot{E}^3 i^3 i^3 \dot{n} \dot{O} \gg \dot{n} \dot{a} i^3 \dot{U} \dot{a}^1 \gg \dot{E} \quad \dot{a} \dot{n} i^3 \gg \dot{O} \quad 3 \beta \dot{E}^3 i^3 i^3 \dot{n} \dot{O} \gg \dot{n} \dot{A} \quad \mu^3 i^3 \dot{I}^3 \dot{Y} \dot{C} \dot{Y} \quad 3 \dot{n}^3 \cdot \gg \dot{Y} \quad 3 \dot{n} \dot{O}^3 \cdot 3 \dot{Y} \dot{u} \dot{a} \dot{O} \dot{U} \quad \dot{N}^3 i^3 \gg \dot{E}^3 1 \dot{n} \dot{C} \quad \beta \gg \dot{O} \dot{U}^3 \dot{Y} \dot{A} : \dot{I}^3 \dot{U} \dot{n}^3 \dot{N} \gg \dot{O} \quad 1 \gg \dot{a} \dot{u} \dot{a} \dot{O} \dot{U} \quad q_w \rightarrow 0 \Rightarrow I_w \rightarrow \infty. \quad 3 \beta \dot{E}^3 i^3 i^3 \dot{n} \dot{O} \gg \dot{n} \dot{u} \quad 3 \dot{I} \dot{Y} \dot{A}^3 \dot{n} \dot{A} \dot{a} \dot{n} \gg \dot{Y} \quad \times \beta \cdot \dot{n} i^3 \dot{a} \dot{O} \dot{U} \quad \gg \dot{Y} \quad \dot{N}^3 i^3 \gg \dot{E}^3 1 \dot{n} \dot{C} \quad \beta \gg \dot{O} \dot{U}^3 \dot{Y} \dot{A} \quad \dot{N}^3 \dot{U}^3 \dot{a}^3 i^3 \quad 3 \dot{e} \dot{E}^3 \dot{Y} :$

3. $\dot{O} \dot{a}^1 \gg \dot{E} \dot{C} \cdot \dot{Y}^3 \dot{N}^3 i^3 \dot{a} \dot{O} \dot{U}$

3.1. $\dot{u} \cdot i^3 \cdot \dot{a} \dot{n} \dot{I}^3 \dot{I}^3 \dot{I}^3 i^3 \dot{I}^3 \dot{U}^3 \dot{E} \dot{Y} \gg \dot{n} :$ $\mathbb{I} \dot{Y}^3 \dot{N}^3 i^3 \dot{a} \dot{O} \dot{U} \dot{Y} \quad \dot{C} \dot{n}^3 \dot{I}^3 \dot{Y}^3 \quad \dot{O} i^3 \gg \dot{E} \quad \dot{J} \quad 2000-2010 \dot{A} \dot{A} \quad \gg \dot{e}^3 \dot{U} \dot{e} \dot{U}^3 \dot{I}^3 \dot{U} \dot{C} \dot{Y} \quad i^3 \dot{I}^3 \dot{U}^3 \dot{E} \dot{Y} \gg \dot{n} \dot{C} \quad \dot{u} \cdot i^3 \cdot \dot{a} \dot{n} \dot{I}^3 \dot{U} \mu^3 : \quad \dot{O} \dot{a}^1 \gg \dot{E} \dot{C} \quad \div \quad \dot{a} \div \dot{a} \dot{E}^3 \dot{I}^3 \dot{Y} \dot{Y} \gg \dot{n} \dot{A} \quad \dot{I}^3 \dot{e} \dot{a} \dot{O} i^3 \gg \dot{E} \quad \gg \dot{Y} \quad \div \quad 3 \dot{e} i^3 \quad \dot{O} \dot{C} \quad \dot{A}^3 \dot{U}^3 \dot{Y}^3 \dot{I}^3 \dot{U} \dot{C} \dot{Y} \quad \beta^3 \dot{n} \dot{u} \gg \dot{n} \dot{A} \quad \dot{E} \dot{a} \cdot 3 \quad \dot{n} \dot{C} \dot{A} \dot{U} \gg \dot{E} \dot{a} i^3 \quad \dot{N}^3 \dot{B} i^3 \dot{n} i^3 \gg \dot{E} \dot{a} i^3 \quad \beta \gg \dot{O} \dot{a} \dot{O} \dot{U} \dot{Y} \gg \dot{n} \dot{A} \quad \dot{N}^3 \dot{U}^3 \dot{a}^3 i^3 \quad 3 \dot{e} \dot{E}^3 \dot{Y} \quad \gg \dot{n} \dot{I}^3 \dot{n}^3 \dot{A}^3 \dot{U} \dot{I} \gg i^3 \quad \dot{U} \dot{C} i^3 \quad \dot{a} \dot{O} \dot{U} \dot{Y} \gg \dot{n} \dot{C} \dot{O}^4 :$

3.2. $\mathbb{I} \dot{Y}^3 \dot{N}^3 i^3 \dot{U}^3 \dot{Y} \quad \dot{U} \gg \dot{A} \dot{a}^1 \quad \cdot \quad \dot{e} i^3 \quad \dot{O} i^3 \dot{I}^3 \quad 3 \dot{n}^1 \dot{U} \dot{a} \dot{O} \dot{Y} \dot{U} \dot{Y} \gg \dot{n} :$ $\dot{O} \dot{C} \dot{Y} \dot{a} \quad \cdot \dot{Y}^3 \dot{N}^3 i^3 \dot{U}^3 \dot{Y} \quad \dot{U} \gg \dot{A} \dot{a}^1 \dot{C} \quad \dot{Y} i^3 \dot{n}^3 \cdot \dot{n} \dot{a} \dot{O} \dot{U}^3 \dot{Y} \dot{A} \quad 3 \dot{Y}^3 \dot{n}^3 \quad 1^3 \quad \dot{e} \dot{Y}^3 \dot{E} \dot{A}, \dot{Y}^3 \dot{E} \quad 3 \quad \dot{Y} \dot{N} \dot{n}^3 \dot{A} \gg \dot{B} i^3 \quad \dot{J} \quad \dot{E} \dot{a} \dot{O} i^3 \gg \dot{E} \quad \dot{I}^3 \quad \dot{e} \dot{a} \dot{O} i^3 \gg \dot{E} \quad \dot{I}^3 \quad \dot{U} \dot{a}^1 \gg \dot{E} \dot{A} : \quad \dot{e} i^3 \dot{a} \dot{n} \cdot \dot{Y} i^3 \dot{n}^3 \cdot \dot{n} i^3 \dot{a} \dot{O} \dot{U} \quad \dot{J} \quad \dot{U} \dot{a}^1 \gg \dot{E} \dot{C} \quad \dot{e}^3 \quad \dot{O} \dot{C} \dot{a} \dot{Y}^3 \quad \dot{E} \quad \dot{e} \dot{a}^3 \quad \dot{e} \dot{a} \dot{O} \dot{U} \dot{Y} \gg \dot{n} \dot{a} i^3 \quad \dot{E} \dot{a} \dot{O} i^3 \dot{a} \dot{O} \dot{U} \dot{A} \quad \dot{N} \dot{C} \dot{U} \dot{U} \quad \dot{A} \dot{Y}^1 \dot{a} \dot{O} \dot{Y} \gg \dot{E} \dot{a} i^3 \quad \dot{a} \dot{a} \quad \cdot \quad \dot{O} \dot{a} \dot{n} \gg \dot{Y} \dot{a} \quad [13] \quad \dot{N} \gg \dot{O} \dot{C} \dot{Y}^3 \dot{I} \dot{Y} \gg \dot{n} \dot{C} \quad 3 \beta \dot{E}^3 i^3 \dot{Y} \dot{U} \dot{A} : \quad 2 \quad \dot{U} \dot{e} \dot{a} \dot{C} \dot{e} \dot{a} i^3, \quad \dot{U} \dot{a}^1 \gg \dot{E} \dot{C} \quad \dot{N}^3 i^3 \quad \dot{e}^3 \quad \dot{n} \dot{a} \dot{O} \dot{U} \dot{Y} \gg \dot{n} \dot{C} \quad \dot{N}^3 \dot{U}^3 \dot{I}^3 \dot{n} \cdot \dot{A} \quad \dot{U}^3 i^3 \quad \dot{n} \dot{C} \dot{O}^3 \quad \dot{U} \dot{C} \dot{Y} i^3 \quad \gg \dot{e} \dot{u} \dot{a} i^3 \quad \dot{I}^3 \dot{n} \gg \dot{E} \dot{C} \quad \dot{J} \quad \dot{Y} \gg \dot{n} \dot{I}^3 \dot{U}^3 \quad \dot{O} \dot{Y} \gg \dot{E} \dot{N} \gg i^3 \quad \cdot \quad \dot{U}^3 \dot{E} \dot{I} \gg \dot{n} \dot{a} .$

$$B_{11} X_t = A_{11} E_t (X_{t+1}) + B_{12} X_{t-1} + e_t \quad e_t \sim N(0, D) \tag{11}$$

$\dot{a} \dot{n} i^3 \gg \dot{O} \quad B_{11}, A_{11}, B_{12} \quad \dot{I}^3 \dot{e} \dot{a} \dot{O} i^3 \gg \dot{E} \quad \dot{I}^3 \dot{U}^3 \dot{U} \dot{C} \dot{Y} \quad \cdot \dot{a} \dot{n} \dot{I}^3 \dot{I} \dot{C} \dot{O} \dot{Y} \gg \dot{n} \dot{C} \quad \dot{U}^3 i^3 \quad \dot{n} \dot{C} \dot{O} \dot{Y} \gg \dot{n} \dot{Y} \quad \gg \dot{Y}, \quad e_t - \dot{Y} \quad \dot{e} \dot{E}^3 \dot{E} \dot{Y} \gg \dot{n} \dot{C} \quad i^3 \gg \dot{I}^3 \dot{a} \dot{n} \dot{A}, \quad \dot{C} \dot{e} \dot{I} \quad D - \dot{Y} \quad 1 \dot{C} \dot{e} \dot{a} \gg \dot{n} \dot{e} \dot{C}^3 \dot{U} \dot{C} \dot{Y} \quad 3 \quad \dot{Y} \dot{I} \dot{U} \dot{a} \dot{O} \dot{Y}^3 \cdot \dot{I}^3 \dot{U} \dot{C} \dot{Y} \quad \dot{U}^3 i^3 \quad \dot{n} \dot{C} \dot{O} \dot{A} \quad (\dot{A} \dot{Y}^1 \dot{E}^3 \dot{U} \dot{Y} i^3 \dot{I}^3 \quad \dot{U} \dot{a}^1 \gg \dot{E} \dot{C} \quad \dot{Y} \gg \dot{n} \dot{I}^3 \dot{U}^3 \quad \dot{O} \dot{a} \dot{O} \dot{U} \dot{A} \quad (11) \quad i^3 \quad \gg \dot{e} \dot{u} \dot{a} i^3 \quad i^3 \quad \gg \dot{e} \quad \dot{D}^3 \quad i^3 \gg \dot{E}^3 \quad \dot{I}^3 \quad 2) :$

$\dot{D}^3 \dot{U}^3 \dot{I}^3 \dot{n} \cdot \dot{C} \quad \dot{E} \dot{a} \dot{O} i^3 \dot{a} \dot{O} \dot{U} \dot{A} \quad \div \quad \dot{Y} i^3 \quad \dot{n} i^3 \dot{a} \dot{O} \dot{U} \quad \dot{J} \quad \dot{N} \gg i^3 \quad \cdot \quad \dot{U}^3 \dot{E} i^3 \quad \gg \dot{e} \dot{u} \dot{a} i^3 \quad (3 \quad \dot{Y} \dot{a} \dot{n} \dot{a} \dot{B} \cdot \dot{a} \dot{n} \dot{I}^3 \dot{I} \dot{C} \dot{O} \dot{Y} \gg \dot{n} \dot{C} \quad \dot{U} \dot{a} i^3 \quad \gg \dot{O} \dot{a} \dot{O} \dot{U}) .$

$$X_{t+1} = \Omega X_t + \Gamma e_{t+1} \tag{12}$$

$\dot{I} \gg \dot{O}^3 \quad 1 \dot{n} \gg \dot{E} \dot{a} i^3 \quad (12) \quad \dot{N}^3 \quad i^3 \quad \dot{e}^3 \quad \dot{n} \dot{a} \dot{O} \dot{U} \dot{A} \quad (11) - \dot{C} \quad \dot{U} \gg \dot{C} \quad \dot{I} \dot{e} i^3 \quad 3 \quad \dot{Y}^3 \quad \dot{Y} \dot{u} .$

$$B_{11} X_t = A_{11} E_t (\Omega X_t + \Gamma e_{t+1}) + B_{12} X_{t-1} + e_t = A_{11} \Omega X_t + B_{12} X_{t-1} + e_t$$

$\dot{a} \dot{n} i^3 \gg \dot{O} \dot{C} \dot{O} \quad \dot{J} \dot{E}$

$$X_t = (B_{11} - A_{11} \Omega)^{-1} B_{12} X_{t-1} + (B_{11} - A_{11} \Omega)^{-1} e_t \tag{13}$$

$\gg \dot{Y} \dot{A}^3 \quad 1 \dot{n} i^3 \dot{a} \dot{O} \dot{U} \quad \dot{J} \quad \dot{a} \dot{n} \cdot \dot{a} \dot{U} \dot{a} \dot{O} \dot{U} \dot{A} \dot{O} \dot{Y} \dot{C} \quad (B_{11} - A_{11} \Omega) \quad \dot{U}^3 \quad i^3 \quad \dot{n} \dot{C} \dot{O} \dot{C} \quad \dot{N}^3 \dot{I}^3 \quad 1^3 \quad \dot{n} \dot{O} \dot{A} :$

$(12) \quad \cdot \quad (13) \quad \dot{N}^3 \quad i^3 \quad \dot{e}^3 \quad \dot{n} \dot{a} \dot{O} \dot{U} \dot{Y} \gg \dot{n} \dot{C} \dot{O} \quad \dot{I} \dot{a} \dot{O} \dot{Y} \gg \dot{Y}^3 \quad \dot{Y} \dot{u} .$

$^3 \quad 2 \quad \dot{O} \mu \dot{U} \dot{a} \dot{O} \dot{n} \dot{A} \quad \dot{D} \dot{D} \quad \dot{I} \quad \cdot \quad 2 \quad i^3 \quad \dot{I} :$

$^4 \quad \dot{A}^3 \quad \dot{U}^3 \quad \dot{Y}^3 \quad \dot{I}^3 \quad \dot{U} \dot{C} \dot{Y} \quad \beta^3 \quad \dot{n} \dot{u} \gg \dot{n} \dot{C} \quad \dot{e} \gg \frac{1}{2} \dot{a} \dot{Y}^3 \quad \dot{U} \dot{C} \dot{Y} \quad \dot{N}^3 \quad \dot{n} \dot{A} \gg \dot{O} \dot{a} \dot{O} \dot{U} \dot{Y} \quad \dot{C} \dot{n}^3 \quad \dot{I}^3 \quad \dot{Y}^3 \quad \dot{O} i^3 \gg \dot{E} \quad \dot{J} \quad \text{Tramo/Seats} \quad \dot{N}^3 \quad \dot{n} \dot{A} \gg \dot{O} \dot{U}^3 \quad \dot{Y} \quad \gg \dot{O}^3 \quad \dot{Y}^3 \quad \dot{I} \dot{a} i^3 :$

$$X_t = \Omega X_{t-1} + \Gamma e_t \quad (14)$$

ání » \tilde{O}

$$\Omega = (B_{11} - A_{11}\Omega)^{-1} B_{12}$$

$$\Gamma = (B_{11} - A_{11}\Omega)^{-1}$$

àöëi Ç DSGE Úá¹»ÉÁ Ĩ³ ñ»ÉÇ ħ Ý»ñĨ³ Ū³ óÝ»É VAR(1) Ĩ »èùáí (14) .. áóÝ»Ý³ Éáí X, í»Ĩi áñÇ
 máíñ µ³ Ō³ ¹ñÇáÝ»ñÁ Ĩ³ ñ»ÉÇ ħ Ū³ Ý. Ý³ Ñ³ Ĩ »É÷ áùñ³ . áóŪÝ ù³ é³ ĨáóëÇÝ»ñÇ »Ō³ Ý³ Ĩáí :

² ŪŪ³ Ý¹ñ³ ¹³ éÝ³ Ýù Úá¹»ÉÇ Ĩ³ éáóóí³ Ĩ³ Ū³ ŪÝ. áñĨ³ ĨÇóÝ»ñÇ . Ý³ Ñ³ Ĩ Ū³ Ý IRFM (Impulse
 Response Function Matching) Ū»Áá¹ÇÝ: Ø»Áá¹Ç ħáóŪŪáóÝÁ Ĩ³ Ū³ ÝáóŪ ħ Ñ»i Ū³ ÉáóŪ. Ý³ È
 ÷³ ëi³ óÇ Á³ Ū³ Ý³ Ĩ³ ŪÝ ß³ ñù»ñÇ ū. Ĩ³ . áñĨ³ Ū³ Ūµ . Ý³ Ñ³ Ĩ íáóŪ ħ í»Ĩi áñ³ Ĩ³ Ý
 ³ íi áé»ñ»ëÇáÝ Úá¹»É VAR(1), áñÇó Ñ»i á³ ÝÑ³ Ū á³ ñ³ Ū»i ñ»ñÇ Ñ³ Ū³ ñ ëi³ óí³ Ĩ
 . Ý³ Ñ³ Ĩ Ĩ³ ÝÝ»ñÇ á³ ñ³ . ŪáóŪ Ñ³ ßí³ ñĨíáóŪ ħ Ĩ³ ñµ»ñ ßáĨ»ñÇ ¹»àúáóŪ Úá¹»ÉÇ
 ÷á÷ áÉ³ Ĩ³ ÝÝ»ñÇ ñó³ . ÝùÁ (Impulse Responses of Data, IR_{Data}):

Ð³ çáñ¹ ù³ ŪÝÝ ÝáóŪÝ³ ÝáóÝ ßáĨ»ñÇ ¹»àúáóŪ Ñ³ ßí³ ñĨíáóŪ ħ DSGE Úá¹»ÉÇ
 ÷á÷ áÉ³ Ĩ³ ÝÝ»ñÇ ¹ÇÝ³ ŪÇĨ³ ñó³ . ÝùÁ (Impulse Responses of DSGE model, IR_{Model}),

áñáÝù . Ý»ñ³ óíáóŪ »Ý Úá¹»ÉÇ . áñĨ³ ĨÇóÝ»ñÇ µ³ ŪŪ³ ÁÇí³ ñÁ»ùÝ»ñÇ á³ ñ³ . ŪáóŪ
 ÁÝi ñí³ Ĩ ÁáóŪÉ³ Ĩ ñ»ÉÇ ñÁ»ùÝ»ñÇ µ³ ŪáóŪŪáóÝÇó: ¶ áñĨ³ ĨÇóÝ»ñÇ Ū³ ñÁ»ùÝ»ñÁ, áñáÝù
 ³ á³ ÑáíáóŪ »Ý IR_{Model} -Ç Ū»Ý³ Úáí³ ñ¹ŪáóÝùÁ ÷³ ëi³ óÇ Ĩ íŪ³ ÉÝ»ñÇ ŪÇçáóáí ëi³ óí³ Ĩ
 IR_{Data} -Ç Ñ»i Ñ³ Ū»Ū³ Ĩ »Éç, ÁÝ¹áóŪÝáóŪ »Ý áñá»ë Ñ³ Ū³ á³ Ĩ³ ëÉ³ Ý . áñĨ³ ĨÇóÝ»ñÇ
 . Ý³ Ñ³ Ĩ Ĩ³ ÝÝ»ñ:

² ŪëàÇéáí, Ýí³ ½³ . áóŪÝÇ ħ Ñ³ éóíáóŪ ÁÝi ñ³ Ýù³ ŪÝ .. Ĩ »ë³ Ĩ³ Ý IR-»ñÇ (Impulse Responses)
 ŪÇç» Ñ»é³ íáñáóŪŪáóÝÁ $\sum (IR_{Data} - IR_{Model})^2$:

Ūßí³ Ĩ . áñĨ³ ÁÝÁ³ óÁ . ñ³ Ĩ³ ÝáóŪŪáóÝáóŪ Ñ³ Ū³ ÝÇ ħ áñá»ë IRFM (Impulse Response Function
 Matching) . Ý³ Ñ³ Ĩ áóŪ: ŪĨ³ Ĩ »Ýù, áñ ÷³ ëi³ óÇ Ĩ íŪ³ ÉÝ»ñÇ ÑÇŪ³ Ý íñ³ . Ý³ Ñ³ Ĩ »Éáí
 ³ í»ÉÇ µ³ ñŌñ Ĩ³ ñ. Ç í»Ĩi áñ³ Ĩ³ Ý³ íi áé»ñ»ëÇáÝ Úá¹»É ŪÇ³ Ýß³ Ý³ Ĩ³ ñ»ÉÇ ħ ëi³ Ý³ É
 ³ é³ í»ÉÉ³ í³ ñ¹ŪáóÝùÝ»ñ, ë³ Ĩ³ ŪÝ ù³ ÝÇ áñ³ ŪÝáóŪ»i .. Ñ³ Ū»Ū³ Ĩ áóŪŪáóÝ ħ ñíáóŪ DSGE
 Úá¹»ÉÇ .. Ý³ Ñ³ Ĩ í³ Ĩ í»Ĩi áñ³ Ĩ³ Ý³ íi áé»ñ»ëÇáÝ Úá¹»ÉÇ ÷á÷ áÉ³ Ĩ³ ÝÝ»ñÇ
 ³ ñó³ . Ýù»ñÇ ŪÇç» (IR-»ñÇ ŪÇç»), á³ Ñ³ Ū³ ¹ñ»ÉÇáóŪŪ³ Ý³ á³ ÑáíŪ³ Ý Ýá³ Ĩ³ Ĩáí
 ³ ÝÑ³ Á»ßi ħ . Ý³ Ñ³ Ĩ »ÉVAR(1) Úá¹»É

² ŪëàÇéáí, Ýí³ ñ³ . ñí³ Ĩ Ū»Áá¹áí Çñ³ Ĩ³ Ý³ óí»É ħ Úá¹»ÉÇ Ĩ³ éáóóí³ Ĩ³ Ū³ ŪÝ . áñĨ³ ĨÇóÝ»ñÇ
 . Ý³ Ñ³ Ĩ áóŪ: ÐÇŪù ÁÝ¹áóŪ»Éáí Hall [14] Ñ»ŌÇÝ³ ĨÇ³ ßÉ³ Ĩ³ ÝùÁ, Úá¹»ÉÇ . áñĨ³ ĨÇóÝ»ñÁ
 Ĩ ñáñí»É ħ »ñĨáó »ÝÁ³ ÈŪµÇ, áñáÝóÇó Ū»ĨÁ Ý»ñĨ³ Ū³ óÝáóŪ ħ . Ý³ Ñ³ Ĩ íáó, ÇëĨ ŪŪáóëÁ
 ýÇùëí³ Ĩ (á³ ÷³ µ»ñí³ Ĩ, calibrated) á³ ñ³ Ū»i ñ»ñÇ »ÝÁ³ ÈáóŪµÁ:

Üß»Ýù, áñ ã·Ý³ Ñ³ ì í áõ · áñÍ³ ÌÇóÝ»ñÇ ÈÙµáõÙ ÁÝ¹· ñĪ í³ Í »Ý³ ÕÝàÇèÇ · áñÍ³ ÌÇóÝ»ñ, áñáÝù Çñ»ÝóÇó Ý»ñĪ³ Û³ óÝáõÙ »Ý³ ì³ ñµ»ñ ÷ á÷ áĒ³ Ī³ ÝÝ»ñÇ ì³ »ë³ Ī³ ñ³ ñ ĪßÇéÝ»ñ · (áõëĪ Ç Ñ»ßĪ Ñ³ ßĪ³ ñĪ»ĒÇ »Ý³ ÷³ ëĪ³ óÇ íÇ×³ Ī³ · ñáõÃÛ³ Ý ÑÇÙ³ Ý í ñ³) ·³ ì³ áé»· ñ»ëÇáÝ · áñÍÁÝÃ³ óÝ»ñÁ ÝĪ³ ñ³ · ñáõ · áñÍ³ ÌÇóÝ»ñ (·Ý³ Ñ³ ì í »Ē »Ý³ ÷³ é³ ÝÓÇÝ é»· ñ»ëÇáÝ í »ñĪ áõĪ áõÃÛ³ Ý ÑÇÙ³ Ý í ñ³):

Øá¹»ĒÇ Ī³ éáõóí³ Í ù³ ŨÇÝ · áñÍ³ ÌÇóÝ»ñÇ · Ý³ Ñ³ ì áõÙÁ IRFM Û»Ãá¹áí Çñ³ Ī³ Ý³ óí»ĒÇ ĸ MatLab ÛÇÇ³ í³ ŨáõÙ · áñÍ áõ · Ñ»Ī · Û³ Ē · áñÍ áõáõÃÛáõÝ»ñÁ Ī³ ì³ ñáõ Ī ñ³ · ñ³ ŨÇÝ ÷³ Ã»ÃÇ³ ÛÇÇáóáí.

1. ÷³ ëĪ³ óÇ Á³ Û³ Ý³ Ī³ ŨÇÝ ß³ ñù»ñÇ ÛÇÇáóáí VAR(1) Ûá¹»ĒÇ · Ý³ Ñ³ ì áõÙ
2. Ûá¹»ĒÇ ĒáõĪ áõÙ · áñÍ³ ÌÇóÝ»ñÇ ì³ ñµ»ñ³ ñÁ»ùÝ»ñÇ ¹»à ùáõÙ (Ý³ Ē Ī³ ì³ ñĪ áõÙ ĸ · áñÍ³ ÌÇóÝ»ñÇ ÷³ ñÁ»ùÝ»ñÇ á³ ì³ Ñ³ Ī³ Ý ÷ ÝĪ ñáõÙ, ÷³ ŨÝáõÑ»Ī · ëĪ³ óí áõ Ý³ Ē Ý³ Ī³ Ý³ ñ¹ ŨáõÝùÝ»ñÇ ÑÇÙ³ Ý í ñ³ ó³ Ýó³ ŨÇÝ áñáÝáõÙ)
3. ÝáõŨÝ³ ÝáõÝ ßáĪ»ñÇ á³ ñ³ ·³ ŨáõÙ VAR(1) · DSGE Ûá¹»ĒÇ IR (Impulse Response) ýáõÝĪ óÇ³ Ý»ñÇ Ñ³ ßĪ³ ñĪ, ¹ñ³ Ýó ÛÇÇ· Ñ»é³ í áñáõÃÛ³ Ý Ñ³ Û»Ù³ ì³ áõÃÛáõÝ · DSGE · áñÍ³ ÌÇóÝ»ñÇ ÷³ ŨÝ Ī áÙµÇÝ³ óÇ³ ŨÇ ÁÝĪ ñáõÃÛáõÝ, áñÝ³ á³ Ñáí áõÙ ĸ ÝĪ³ ½³ · áõŨÝ Ñ»é³ í áñáõÃÛáõÝ:

¶ Ý³ Ñ³ ì Û³ Ý³ ñ¹ ŨáõÝùÝ»ñÁ Ý»ñĪ³ Û³ óÝáõÙ »Ýù ëĪ áñ·.

h	σ	β _q	β _m	β _h	β _w	w _m	w _h	θ _w	ε _w	φ	β _i
0.65	2.50	0.3	0.45	0.6	0.3	0.4	0.5	0.65	3	1	0.4

ÆÝáà»ë Ī³ »ëÝáõÙ »Ýù, ·Ý»ñÇ Ī áßĪ áõÃÛáõÝÁ Ý»ñÙáõĪ Û³ Ý Ñ³ ì í³ Í áõÙ ÷³ í»ĒÇ ó³ Ī ñ ĸ, ù³ Ý Ý»ñùÇÝ Ī ÝĪ »éáõÃÛáõÝáõÙ: ÷³ ßĒ³ Ī³ ì³ ñÓ»ñÇ Ī áßĪ áõÃÛáõÝÁ ÷³ í»ĒÇ Û»Ī ĸ. Ī ÝĪ »éáõÃÛáõÝáõÙ ÷³ ßĒ³ Ī³ ì³ ñÓ³ ŨÇÝ á³ Ũ³ Ý³ · ñ»ñÇ ÛÇÇÇÝ Ī · áõáõÃÛáõÝÁ · ñ»Ã» ÷³ »é³ ÛëŨ³ Ī ĸ:

¶ áñÍ³ ÌÇóÝ»ñÇ »ñĪ ñáñ¹ »ÝÃ³ ÈÙµÇ Ñ³ Û³ ñ ëĪ³ óí »Ē»Ý Ñ»Ī · Û³ Ē³ ñÁ»ùÝ»ñÁ.

$$\begin{aligned}
 b &= 0.99 & k_1 &= 0.575 & a^* &= 0.73 & r_{y^*} &= 0.75 & r_x &= 0.75 \\
 g_y &= 0.25 & k_2 &= 0.075 & a &= 0.73 & r_{i^*} &= 0.82 & r_{gov} &= 0.63 \\
 g &= 0.3 & k_3 &= 0.15 & r_p^* &= 0.75 & r_a &= 0.84
 \end{aligned}$$

ĐÇÙù ÁÝ¹áõÝ»Ēáí · áñÍ³ ÌÇóÝ»ñÇ · Ý³ Ñ³ ì í³ Í ÷³ ñÁ»ùÝ»ñÁ ÷³ ßĒ³ Ī³ ì³ ÝùÇ Ñ³ çáñ¹ Û³ éáõÙ ùÝÝ³ ñĪ áõÙ »Ýù Ûá¹»ĒÇ Ñ³ ì³ Í áõÃÛáõÝ»ñÁ:

4. Øá¹»ĒÇ ÷ á÷ áĒ³ Ī³ ÝÝ»ñÇ ÷³ ñÓ³ ·³ ÝùÁ Ī³ ñµ»ñ µÝáõŨÃÇ ßáĪ»ñÇÝ
- Øá¹»ĒÇ, áñÁ µ»ñĪ áõÙ ĸ ì³ ñµ»ñ³ Ī³ ŨÇÝ Ñ³ í³ ë³ ñáõÙÝ»ñÇ Ñ³ Û³ Ī³ ñ · Ç, · áñÍ³ ÌÇóÝ»ñÇ · Ý³ Ñ³ ì í³ Í ÷³ ñÁ»ùÝ»ñÇ ¹»à ùáõÙ ĒáõĪ í»ĒÇ ĸ MatLab Ī ñ³ · ñ³ ŨÇÝ ÛÇÇ³ í³ ŨáõÙ · áñÍ áõ IRIS

⁵ Õ³ Ã»ÃÁ Ī ñ³ Û³ ¹ñĪ»Ē ĸ ĐĐ Ī»ÝĪ ñáÝ³ Ī³ Ý µ³ ÝĪÇ Ī ÝĪ »ë³ Ī³ Ý Ñ»Ī Ī³ ¼áí áõÃÛáõÝ»ñÇ í³ ñááõÃÛ³ Ý Ī ÝĪ »ë³ ·»Ī Ī · á áõáëŨ³ ÝÇ Ī áõÙÇó:

Toolbox-Ç ÛÇçáóái: àñà»è¼Ç ÑÝ³ ñ³ í áñ ĘÝÇ ¹³ ì áÓáóÁŮáóÝ»ñ ³ Ý»É ³ ßÈ³ ì ³ í³ ñÓ»ñÇ Ĭáßì áóÁŮ³ Ý áóÝ»ó³ Í ³ ½¹»óáóÁŮ³ Ý í»ñ³ μ»ñŮ³ Ę ÝáóŮÝ ßáĬÇ ³ ½¹»óáóÁŮáóÝÁ ¹Çì ³ ñĬí»É ĸ »ñĬáó ÑÝ³ ñ³ í áñ ¹»à ù»ñÇ Ñ³ Û³ ñ, ³ ŮÝ ĸ`

1. Ĭáßì ³ ßÈ³ ì ³ í³ ñÓ»ñ` $q_w = 0.65$,

2. ×ĬáóÝ³ ßÈ³ ì ³ í³ ñÓ»ñ` $q_w \approx 0$,

¶ ñ³ ýÇĬÝ»ñÇ ÛÇçáóái á³ ì Ĭ»ñĬáóŮ ĸ 1% ßáĬÇ á³ ñ³ . ³ ŮáóŮ Ůá¹»Ę ÷ á÷ áÈ³ Ĭ³ ÝÝ»ñÇ ¹ÇÝ³ ÛÇĬ³ Ý (Đ³ í»Ę³ Í 3), áñÁ ÛÇ³ ñÁ»ùáñ»Ý áñáßì áóŮ ĸ Ůá¹»Ę Ñ³ í³ è³ ñáóŮÝ»ñÇ .. á³ ñ³ Û»ì ñ»ñÇÝ Ĭ ñĬ í³ Ĭ³ ñÁ»ùÝ»ñÇ ÛÇçáóái: ĐáĬ . Ĭáí á³ ì Ĭ»ñĬáóŮ ĸ ×ĬáóÝ ($q_w \approx 0$), ÇĕĬ Ĭ»ì ³ . Ĭáí` Ĭáßì ³ ßÈ³ ì ³ í³ ñÓ»ñáí Ůá¹»Ę ÷ á÷ áÈ³ Ĭ³ ÝÝ»ñÇ ¹ÇÝ³ ÛÇĬ³ Ý ($q_w = 0.65$):

ø³ ÝÇ áñ ßáĬÇ Ñ»ì ..³ Ýúái È³ Èì í³ Ĭ³ Ñ³ í³ è³ ñ³ ĬßéáóÁŮ³ Ý í»ñ³ Ĭ³ Ý . ÝáóŮÁ »ñĬ³ ñ³ ì .. . áñĬÁÝÁ³ ó ĸ .. ÁÝÁ³ ÝáóŮ ĸ ÛÇ ù³ ÝÇ ÷ áóĘ»ñáí, ³ á³ Ĭè³ ÑŮ³ Ý³ ÷ Ĭí»Ýù ÛÇ³ ŮÝ ĕĬ¼μÝ³ Ĭ³ Ý ÷ áóĬÁ ÝĬ³ ñ³ . ñ»Ęáí` Ýá³ ì ³ Ĭ³ áóÝ»Ý³ Ęáí Ů»ĬÝ³ μ³ Ý»É Ůá¹»Ę . áñĬÁóáóÁŮ³ Ý Ů»È³ ÝÇ¼ŮÁ .. ¹ñ³ Û³ í³ ñĬ³ ŮÇÝ ù³ Ő³ ù³ Ĭ³ ÝáóÁŮ³ Ý ¹»ñÁ Ñ³ í³ è³ ñ³ ĬßéáóÁŮ³ Ý í»ñ³ Ĭ³ Ý . ÝŮ³ Ý . áñĬÁÝÁ³ óáóŮ:

4.1. Ĭ Ýì »éáóÁŮ³ Ý Ý»ñéáóŮ ³ ñĬ ³ ¹ñĬ³ Í³ áñ³ ÝùÝ»ñÇ . Ý³ ×Ç ßáĬ (¶ Ĭ³ ÝĬ³ ñ 1)

Ů»ñùÇÝ . Ý»ñÇ ³ ×Á μ»ñáóŮ ĸ ÁÝ¹Ñ³ Ýáóñ . Ý»ñÇ Û³ Ĭ³ ñ¹³ ĬÇ (è¶Ĭ) ³ ×Ç: ² ñĬ ³ ¹ñáóÁŮ³ Ý áĬáñì áóŮ . Ý»ñÇ Û³ Ĭ³ ñ¹³ ĬÇ ³ ×Á Ĭñ×³ ì áóŮ ĸ Çñ³ Ĭ³ Ý è³ ÑŮ³ Ý³ ŮÇÝ Ĭ³ Èè»ñÁ .. Ñ³ Û³ Ó³ ŮÝ ùÇĬÇáèÇ ĬáñÇ` . Ý»ñÝ³ á³ . ³ ŮáóŮ ³ ÝĬŮ³ Ý ÛÇì áóŮ »Ý áóÝ»ÝáóŮ:

Ĭ»Ýì ñáÝ³ Ĭ³ Ý μ³ ÝĬÁ (Ĭ´), . áñĬ»Ęáí ¹ñ³ Û³ í³ ñĬ³ ŮÇÝ Ĭ³ ÝáÝÇ Ñ³ Û³ á³ ì ³ èÈ³ Ý .. áóÝ»Ý³ Ęáí Ý»ñùÇÝ³ ñĬ ³ ¹ñáóÁŮ³ Ý ³ áñ³ ÝùÝ»ñÇ . Ý»ñÇ Û³ Ĭ³ ñ¹³ ĬÇ ³ ×, μ³ ñÓñ³ óÝáóŮ ĸ ì áĬáè³ ¹ñáóŮÁ: , ñ³ Ñ»ì ..³ Ýúái èá³ èŮ³ Ý Û³ Ĭ³ ñ¹³ ĬÁ Ĭñ×³ ì íáóŮ ĸ, ÇĕĬ ³ ½³ ŮÇÝ ³ ñÁáóŮÁÁ³ ³ ñÁ»áñí áóŮ:

¼èááó ¹ñ³ Û³ í³ ñĬ³ ŮÇÝ ù³ Ő³ ù³ Ĭ³ ÝáóÁŮ³ Ý ³ ñ¹ŮáóŮÁóŮ ³ ½³ ³ ŮÇÝ³ ñÁáóŮÁÇ ³ ñÁ»áñáóŮÁ, ÇÝáá»è Ý³ .. ÁÝ¹Ñ³ Ýáóñ . Ý»ñÇ Û³ Ĭ³ ñ¹³ ĬÇ ³ ×Á Ñ³ Ý . »óÝáóŮ ĸ Çñ³ Ĭ³ Ý ÷ áÈ³ ñÁ»ùÇ ³ ñÁ»áñŮ³ Ý: Æñ³ Ĭ³ Ý ÷ áÈ³ ñÁ»ùÇ ³ ñÁ»áñáóŮÝ Çñ Ñ»ñĬÇÝ Ñ³ Ý . »óÝáóŮ ĸ ³ ñĬ ³ ùÇÝ ŮñóáóÝ³ ĬáóÁŮ³ Ý ³ ÝĬŮ³ Ý` ³ ñĬ ³ Ñ³ ÝŮ³ Ý Í³ í³ ĘÝ»ñÁ Ĭñ×³ ì íáóŮ »Ý: ŮĬ³ ì »Ýù, áñ Ĭñ×³ ì í»É ĸ ñ Ý³ .. Ý»ñùÇÝ³ áñ³ ÝùÝ»ñÇ ÝĬ³ ì Ů³ ù³ Ñ³ ñ³ μ»ñ³ Ĭ³ Ý á³ Ñ³ ÝÇ³ ñĬÁ: Ůßì ³ Ĭ . áñĬÁÝÝ»ñÇ ³ ½¹»óáóÁŮ³ Ůμ Ĭñ×³ ì íáóŮ ĸ Çñ³ Ĭ³ Ý ĐŮ²-Ý: Æñ³ Ĭ³ Ý ĐŮ²-Ç Ĭñ×³ ì áóŮÁ Ñ³ Ý . »óÝáóŮ ĸ ³ ßÈ³ ì áóÁÇ á³ Ñ³ ÝÇ³ ñĬÇ Ĭñ×³ ì Ů³ Ý, áñÇó Ñ»ì ..áóŮ ĸ ³ ñĬ ³ ¹ñáóÁŮ³ Ý áñáó»éáóŮ Ý»ñ. ñ³ í³ í³ Ĭ³ ßÈ³ ì áóÁÇ Ĭ³ í³ ĘÇ Ĭì ñáóĬ ³ ÝĬáóŮÁ:

Ĭ´ ĬáóŮŮóó ì áĬáè³ ¹ñáóŮÇ μ³ ñÓñ³ óáóŮÁ ³ é³ ç³ óÝáóŮ ĸ ³ ½³ ³ ŮÇÝ³ ñÁáóŮÁÇ ³ ñÁ»áñáóŮ, ÇĕĬ ù³ ÝÇ áñ Ñ³ Û³ Ó³ ŮÝ³ ñĬ³ Ĭ³ »ÝÁ³ ¹ñáóÁŮ³ Ý ³ ÝĬ³ Ý³ Ĭ³ Ý ÷ áÈ³ ñÁ»ùÇ ÷ á÷ áÈ³ áóÁŮáóÝÝ ³ ÝŮÇÇ³ á»è áÇ ÷ áÈ³ Ýóí áóŮ Ý»ñŮáóĬ í³ Ĭ³ áñ³ ÝùÝ»ñÇ . Ý»ñÇÝ, ³ á³ ĬáóÝ»Ý³ Ýù ß»ŐáóŮ

$\bar{U} \gg \bar{I} \cdot \bar{Y} \bar{C} \bar{u} \bar{n} \gg \bar{Y} \bar{u} \bar{C} \bar{o} : \bar{e}^3 + \bar{a} \bar{u} \bar{n} \text{--} \bar{C} \bar{Y} \bar{a} \bar{U} \gg \bar{O} \bar{U}^3 \text{ ó} \bar{Y} \bar{a} \bar{o} \bar{U} \bar{C} \bar{D} \bar{U}^2 \text{--} \bar{C}^3 \bar{Y} \bar{I} \bar{a} \bar{o} \bar{U} \bar{A} . \bar{U} \bar{Y}^3 \bar{i} \gg \bar{E} \bar{C} \bar{u} \bar{C} \bar{a} \bar{C} \bar{E} \bar{C} \bar{Y} \bar{a} \bar{o} \bar{U} , \bar{u}^3 \bar{Y} \bar{I} \bar{E} \bar{C} \bar{Y} \bar{n} , \bar{A} \bar{A} \bar{U} \bar{I} \cdot \bar{Y} \bar{C} \bar{u} \bar{n} \gg \bar{Y} \bar{u} \bar{A} \bar{a}^3 \bar{N} \bar{a}^3 \bar{Y} \bar{i} \bar{n} (y_t < 0) : \text{ó} \bar{n} \bar{u} \bar{U} \bar{I} \cdot \bar{Y} \bar{C} \bar{u} \bar{n} \gg \bar{Y} \bar{u} \bar{A} \bar{a}^3 \bar{N} \bar{a}^3 \bar{Y} \bar{i} \bar{a} \bar{o} \bar{U} \bar{C} ,$
 $\bar{C}^3 \bar{U} \bar{C} \bar{Y}^3 \bar{n} \bar{A} \bar{a} \bar{o} \bar{U} \bar{A} \bar{C}^3 \bar{n} \bar{A} \bar{a} \bar{n} \bar{a} \bar{o} \bar{U} \bar{A} \bar{C} \bar{u} \bar{n} \bar{a} \bar{o} \bar{U} \bar{C} \bar{Y} \bar{n} \bar{U} \bar{a} \bar{o} \bar{I} \bar{U}^3 \bar{Y} \cdot \bar{Y} \bar{n} \bar{C} \bar{I} \bar{n} \times^3 \bar{i} \bar{U}^3 \bar{Y} \bar{N}^3 \bar{Y} \cdot \text{ó} \bar{Y} \gg \bar{E} \bar{a} \bar{o} \bar{I} \bar{Y} \bar{n} \bar{U} \bar{a} \bar{o} \bar{I} \bar{U}^3 \bar{Y} \bar{N}^3 \bar{Y} \bar{i} \gg \bar{a} \bar{a}^3 \bar{N}^3 \bar{Y} \bar{C}^3 \bar{n} \bar{I} \bar{C}^3 \times \bar{C} , \bar{a} \bar{o} \bar{e} \bar{i} \bar{C} \bar{Y}^3 \bar{C}^3 \bar{U} \bar{E} \bar{N}^3 \bar{i}^3 \bar{e}^3 \bar{n} \bar{a}^3 \bar{U} \bar{Y} \bar{Y} \bar{n} \bar{a} \bar{o} \bar{U} \bar{D} \bar{U}^2 \text{--} \bar{C} \bar{I} \bar{n} \times^3 \bar{i} \bar{U}^3 \bar{Y} : \bar{e}^3 \bar{I}^3 \bar{U} \bar{Y} \bar{U} \bar{I} \cdot \bar{Y} \bar{C} \bar{u} \bar{n} \gg \bar{Y} \bar{u} \bar{C} \bar{o} \bar{B} \gg \bar{O} \bar{U}^3 \bar{Y} \bar{1} \gg \bar{a} \bar{u} \bar{a} \bar{o} \bar{U} + \bar{a} \bar{E}^3 \bar{n} \bar{A} \gg \bar{u} \bar{C} + \bar{a} + \bar{a} \bar{E} \bar{a} \bar{o} \bar{A} \bar{U} \bar{a} \bar{o} \bar{Y} \bar{Y}^3 \bar{Y} \bar{U} \bar{C} \bar{C}^3 \bar{a} \gg \bar{e} \bar{a} \bar{C} + \bar{a} \bar{E}^3 \bar{Y} \bar{o} \bar{i} \bar{a} \bar{o} \bar{U} \bar{Y} \bar{n} \bar{U} \bar{a} \bar{o} \bar{I} \bar{i}^3 \bar{I}^3 \bar{a} \bar{n}^3 \bar{Y} \bar{u} \bar{Y} \bar{n} \bar{C} \cdot \bar{Y} \bar{n} \bar{C} \bar{Y} . \bar{i} \bar{i} \bar{U}^3 \bar{E}^3 \bar{1} \gg \bar{a} \bar{u} \bar{a} \bar{o} \bar{U} \bar{1} \bar{n}^3 \bar{Y} \bar{u} \bar{a} \bar{n} \bar{a} \bar{B} \bar{A}^3 \bar{U}^3 \bar{Y}^3 \bar{I} \bar{I} \bar{i}^3 \times^3 \bar{e} \bar{i} \gg \bar{Y}^3 \bar{i} \gg \bar{E} \bar{C} \bar{u} \bar{C} \bar{a} \bar{C} \bar{u} \bar{n} \bar{o} \bar{n} \cdot \bar{Y} \bar{n} \bar{a} \bar{i} . \bar{Y} \bar{n} \bar{u} \bar{C} \bar{Y}^3 \bar{a} \bar{n}^3 \bar{Y} \bar{u} \bar{Y} \bar{n} \bar{C} \bar{U} \bar{n} \bar{o} \bar{a} \bar{o} \bar{Y}^3 \bar{I} \bar{a} \bar{o} \bar{U}^3 \bar{Y} \bar{N} \bar{i} \bar{C}^3 \bar{u}^3 \bar{n} \bar{D} \bar{U}^2 \text{--} \bar{C}^3 \bar{Y} \bar{I} \bar{a} \bar{o} \bar{U}^3 \bar{Y} \bar{U} \bar{C} \bar{C}^3 \bar{a} \gg \bar{e} \bar{i} \gg \bar{O} \bar{C} \bar{a} \bar{C} \bar{a} \bar{o} \bar{Y} \gg \bar{Y}^3 :$

$\bar{e}^3 \bar{n} \bar{o}^3 \bar{Y}^3 \cdot \bar{n} \bar{i}^3 \bar{I} \bar{B} \bar{a} \bar{I} \bar{C} \bar{Y} \bar{C} \bar{a}^3 \bar{i}^3 \bar{e} \bar{E}^3 \bar{Y} \bar{I} \bar{C} \cdot \bar{a} \bar{n} \bar{I} \bar{a} \bar{o} \bar{A} \bar{o} \bar{A} \bar{U} \bar{a} \bar{o} \bar{Y} \bar{Y} \bar{n} \bar{C}^3 \bar{n} \bar{I} \bar{a} \bar{o} \bar{Y} \bar{u} \bar{a} \bar{o} \bar{U} \cdot \bar{n}^3 \bar{Y} \bar{o} \bar{i}^3 \bar{I} \bar{U} \bar{I} \cdot \bar{Y} \bar{C} \bar{u} \bar{n} \gg \bar{Y} \bar{u} \bar{C} \bar{o} \bar{u}^3 \bar{o}^3 \bar{e}^3 \bar{I}^3 \bar{Y} \bar{B} \gg \bar{O} \bar{a} \bar{o} \bar{U} \bar{A} , \bar{C} \bar{Y} \bar{a} \bar{a} \gg \bar{e} \bar{Y}^3 \bar{Y} \bar{n} \bar{u} \bar{C} \bar{Y} \bar{y} \bar{C} \bar{n} \bar{U}^3 \bar{Y} \bar{n} \bar{C} \bar{C} \bar{n}^3 \bar{I}^3 \bar{Y} \bar{e}^3 \bar{N} \bar{U}^3 \bar{Y}^3 \bar{U} \bar{C} \bar{Y} \bar{I}^3 \bar{E} \bar{e} \bar{n} \bar{A} : \bar{e}^3 \bar{Y} \bar{B}^3 \bar{Y}^3 \bar{I} \bar{a} \bar{o} \bar{U} \bar{C} , \bar{a} \bar{n} \bar{I} \bar{C} \bar{1} \bar{n}^3 \bar{U}^3 \bar{i}^3 \bar{n} \bar{I}^3 \bar{U} \bar{C} \bar{Y} \bar{u}^3 \bar{O}^3 \bar{u}^3 \bar{I}^3 \bar{Y} \bar{a} \bar{o} \bar{A} \bar{U} \bar{a} \bar{o} \bar{Y} \bar{A} \bar{u} \bar{U} \bar{I} \bar{i} \bar{C} \bar{i} \bar{Y} \bar{i} \gg \bar{e}^3 \bar{I}^3 \bar{Y} \bar{N} \bar{C} \bar{U} \bar{u} \bar{n} \bar{C} \bar{e} \bar{i} \gg \bar{O} \bar{I} \bar{a} \bar{o} \bar{U} \bar{Y} \bar{n} \bar{U} \bar{a} \bar{o} \bar{I} \bar{a} \bar{o} \bar{y} \bar{C} \bar{n} \bar{U}^3 \bar{Y} \bar{n} \bar{C} \bar{I} \bar{a} \bar{o} \bar{U} \bar{C} \bar{o} \cdot \bar{Y} \bar{n} \bar{C} \bar{C} \bar{C} \gg \bar{o} \bar{U}^3 \bar{Y} \bar{N}^3 \bar{U}^3 \bar{n} :$

$\bar{e}^3 \bar{B} \bar{E}^3 \bar{i} \bar{a} \bar{o} \bar{A} \bar{C} \bar{e} \bar{a}^3 \bar{e} \bar{U}^3 \bar{Y} \bar{U} \bar{C} \bar{C} \bar{C} + \bar{a} \bar{E}^3 \bar{n} \bar{C} \bar{Y} \bar{U}^3 \bar{Y} \bar{e}^3 \bar{N} \bar{U}^3 \bar{Y}^3 \bar{U} \bar{C} \bar{Y} \bar{Y} \bar{a} \bar{n} \bar{U} \bar{A} \bar{I} \bar{n} \times^3 \bar{i} \bar{i} \bar{a} \bar{o} \bar{U} \bar{C} \bar{e} \bar{a}^3 \bar{e} \bar{U}^3 \bar{Y} \bar{B} \bar{E}^3 \bar{i}^3 \bar{A}^3 \bar{U}^3 \bar{Y}^3 \bar{I} \bar{C} \bar{I} \bar{n} \times^3 \bar{i} \bar{U}^3 \bar{Y} \bar{N} \bar{i} \bar{Y} \bar{u} \bar{a} \bar{i} :$

$\bar{O} \bar{I} \bar{a} \bar{o} \bar{Y}^3 \bar{B} \bar{E}^3 \bar{i}^3 \bar{i}^3 \bar{n} \bar{o} \bar{n} \bar{C}^3 \bar{1} \gg \bar{a} \bar{u} \bar{a} \bar{o} \bar{U} \bar{a}^3 \bar{N} \bar{a}^3 \bar{Y} \bar{i} \bar{a} \bar{o} \bar{U} \bar{C}^3 \bar{B} \bar{E}^3 \bar{i} \bar{a} \bar{o} \bar{A} \bar{C} \bar{e} \bar{a}^3 \bar{e} \bar{U}^3 \bar{Y} + \bar{a} \bar{E}^3 \bar{n} \bar{C} \bar{Y} \bar{U}^3 \bar{Y} \bar{Y} \bar{n} \bar{A}^3 \bar{U}^3 \bar{Y}^3 \bar{I}^3 \bar{U} \bar{C} \bar{Y} \bar{a}^3 \bar{U}^3 \bar{Y} \bar{A} , \bar{U} \bar{Y} \bar{C} \bar{w}_t - p_t = m r s_t , \bar{a} \bar{n} \bar{C} \bar{o} \bar{N} \bar{i} \bar{a} \bar{o} \bar{U} \bar{C} , \bar{a} \bar{n} + \bar{a} \bar{E}^3 \bar{n} \bar{C} \bar{Y} \bar{U}^3 \bar{Y} \bar{e}^3 \bar{N} \bar{U}^3 \bar{Y}^3 \bar{U} \bar{C} \bar{Y} \bar{Y} \bar{a} \bar{n} \bar{U} \bar{C} \bar{I} \bar{n} \times^3 \bar{i} \bar{a} \bar{o} \bar{U} \bar{A} \bar{N}^3 \bar{Y} \cdot \text{ó} \bar{Y} \bar{a} \bar{o} \bar{U} \bar{C} \bar{C} \bar{n}^3 \bar{I}^3 \bar{Y}^3 \bar{B} \bar{E}^3 \bar{i}^3 \bar{i}^3 \bar{n} \bar{o} \bar{n} \bar{C} \bar{I} \bar{n} \times^3 \bar{i} \bar{U}^3 \bar{Y} :$

$\bar{O} \bar{U} \bar{a} \bar{o} \bar{e} \bar{I} \bar{a} \bar{o} \bar{U} \bar{C} \bar{o} , \bar{I} \bar{a} \bar{B} \bar{i}^3 \bar{B} \bar{E}^3 \bar{i}^3 \bar{i}^3 \bar{n} \bar{o} \bar{n} \bar{a} \bar{i} \bar{U} \bar{a}^3 \bar{E} \bar{a} \bar{o} \bar{U}^3 \times \bar{a} \bar{o} \bar{U} \bar{C}^3 \bar{B} \bar{E}^3 \bar{i}^3 \bar{i}^3 \bar{n} \bar{o} \bar{n} \bar{C} \bar{N}^3 \bar{i} \bar{E}^3 \bar{1} \bar{C} \bar{n} \bar{A} , \bar{C} \bar{Y} \bar{a} \bar{A} \bar{N}^3 \bar{U}^3 \bar{O}^3 \bar{U} \bar{Y}^3 \bar{B} \bar{E}^3 \bar{i}^3 \bar{i}^3 \bar{n} \bar{o} \bar{n} \bar{C} \bar{Y} \bar{a} \bar{n} \bar{u} \gg \bar{U} \bar{Y} \bar{e} \bar{U}^3 \bar{Y} \bar{u} \bar{C} \bar{E} \bar{C} \bar{a} \bar{e} \bar{C} \bar{I} \bar{a} \bar{n} \bar{C} \bar{u} \bar{n} \bar{a} \bar{o} \bar{U} \bar{C}^3 \bar{B} \bar{E}^3 \bar{i}^3 \bar{i}^3 \bar{n} \bar{o} \bar{n} \bar{C} \bar{U}^3 \bar{I}^3 \bar{n}^3 \bar{I} \bar{C} \bar{I} \bar{n} \times^3 \bar{i} \bar{U}^3 \bar{Y} :$

$\bar{I} \bar{a} \bar{B} \bar{i} \bar{C} \bar{I} \bar{a} \bar{o} \bar{Y}^3 \bar{B} \bar{E}^3 \bar{i}^3 \bar{i}^3 \bar{n} \bar{o} \bar{n} \bar{a} \bar{i} \bar{U} \bar{a}^3 \bar{E} \bar{Y} \bar{n} \bar{C} \bar{N}^3 \bar{U} \bar{U}^3 \bar{i} \bar{a} \bar{o} \bar{A} \bar{U} \bar{a} \bar{o} \bar{Y} : \bar{I} \bar{a} \bar{B} \bar{i}^3 \bar{B} \bar{E}^3 \bar{i}^3 \bar{i}^3 \bar{n} \bar{o} \bar{n} \bar{a} \bar{i} \bar{U} \bar{a}^3 \bar{E} \bar{a} \bar{o} \bar{U}^3 \bar{B} \bar{E}^3 \bar{i}^3 \bar{i}^3 \bar{n} \bar{o} \bar{n} \bar{A} , \bar{C} \bar{I} \bar{E} \bar{C} \bar{1}^3 \bar{Y} \bar{1}^3 \bar{O}^3 \bar{n} \bar{o}^3 \bar{C} \bar{Y} \bar{u} \bar{n} \bar{E} \bar{a} \bar{i} \bar{B} \bar{a} \bar{I} \bar{C} \bar{Y} , \bar{C} \bar{I} \bar{E} \bar{C} \bar{u} \bar{C} \bar{a} \gg \bar{Y} \bar{Y} \bar{i}^3 \bar{1} \bar{a} \bar{o} \bar{U}^6 .$

$w_t^{I \bar{a} B i} > w_t^{O \bar{I} \bar{a} o Y} \bar{a} \bar{n} \bar{C} \bar{o} \bar{N} \bar{i} \bar{a} \bar{o} \bar{U} \bar{C} , \bar{a} \bar{n} \bar{C} \bar{n}^3 \bar{I}^3 \bar{Y} \bar{e}^3 \bar{N} \bar{U}^3 \bar{Y}^3 \bar{U} \bar{C} \bar{Y} \bar{I}^3 \bar{E} \bar{e} \bar{n} \bar{A} \bar{e} \bar{u} \bar{C} \bar{a} \gg \bar{Y} \bar{I} \bar{n} \times^3 \bar{i} \bar{i} \bar{a} \bar{o} \bar{U} .$

$w_t^{I \bar{a} B i} > w_t^{O \bar{I} \bar{a} o Y} \Rightarrow m c_t^{I \bar{a} B i} > m c_t^{O \bar{I} \bar{a} o Y} , \bar{C} \bar{Y} \bar{a} \bar{A} \bar{Y} \bar{B}^3 \bar{Y}^3 \bar{I} \bar{a} \bar{o} \bar{U} \bar{C} , \bar{a} \bar{n} \bar{Y} \bar{n} \bar{u} \bar{C} \bar{Y}^3 \bar{n} \bar{i}^3 \bar{1} \bar{n} \bar{a} \bar{o} \bar{A} \bar{U}^3 \bar{Y} \bar{Y} \bar{n} \bar{U} \bar{a} \bar{o} \bar{I} \bar{U}^3 \bar{Y} \cdot \bar{Y} \bar{n} \bar{A} \bar{N}^3 \bar{n}^3 \bar{u} \bar{n} \bar{C}^3 \bar{I}^3 \bar{Y} \bar{a} \bar{n} \bar{Y} \bar{u}^3 \bar{n} \bar{o} \bar{n} \gg \bar{Y} \bar{U} \bar{Y} \bar{a} \bar{o} \bar{U} : \bar{a} \bar{n} \bar{a} \gg \bar{e} \bar{N} \bar{i} \bar{C}^3 \bar{Y} \bar{u} \bar{1} \bar{n}^3 \bar{U}^3 \bar{i}^3 \bar{n} \bar{I}^3 \bar{U} \bar{C} \bar{Y} \bar{U}^3 \bar{n} \bar{U} \bar{C} \bar{Y} \bar{A}^3 \bar{C} \bar{I} \bar{E} \bar{C} \bar{1} \bar{e} \bar{a} \bar{a} \bar{o}^3 \bar{I}^3 \bar{Y} \bar{u}^3 \bar{O}^3 \bar{u}^3 \bar{I}^3 \bar{Y} \bar{a} \bar{o} \bar{A} \bar{U} \bar{a} \bar{o} \bar{Y} \bar{C} \bar{i}^3 \bar{n} \bar{a} \bar{o} \bar{U} \bar{C} \bar{i} \bar{a} \bar{l} \bar{a} \bar{e}^3 \bar{1} \bar{n} \bar{a} \bar{o} \bar{U} \bar{Y} \bar{n} \bar{A} \bar{N}^3 \bar{U} \bar{U}^3 \bar{i}^3 \bar{u}^3 \bar{u}^3 \bar{C} \bar{I} \bar{E} \bar{C} \bar{B}^3 \bar{i} \gg \bar{Y} \bar{u}^3 \bar{n} \bar{o} \bar{n}^3 \bar{o} \bar{i} \bar{a} \bar{o} \bar{U} , \bar{C} \bar{Y} \bar{a} \bar{A} \bar{N}^3 \bar{Y} \cdot \text{ó} \bar{Y} \bar{a} \bar{o} \bar{U} \bar{C} \bar{e} \bar{a}^3 \bar{e} \bar{U}^3 \bar{Y}^3 \bar{C} \bar{I} \bar{E} \bar{C} \bar{U} \bar{I} \bar{I} \bar{n} \times^3 \bar{i} \bar{U}^3 \bar{Y} \bar{C} \bar{I} \bar{E} \bar{C} \bar{U} \bar{I}^3 \bar{n} \bar{A} \bar{a} \bar{n} \bar{U}^3 \bar{Y} : \bar{e}^3 \bar{C} \bar{E} \bar{C} \bar{n} \bar{N} \bar{n} \bar{A} \bar{C} \bar{Y} \bar{Y} \bar{B}^3 \bar{Y}^3 \bar{I} \bar{a} \bar{o} \bar{U} \bar{C} \bar{D} \bar{U}^2 \text{--} \bar{C}^3 \bar{C} \bar{I} \bar{E} \bar{C} \bar{U} \bar{I} \bar{I} \bar{n} \times^3 \bar{i} \bar{a} \bar{o} \bar{U} , \bar{a} \bar{n} \bar{C} \bar{o} \bar{u} \bar{E} \bar{a} \bar{o} \bar{U} \bar{C} \cdot \bar{a} \bar{n} \bar{I}^3 \bar{1} \bar{a} \bar{o} \bar{n} \bar{I} \bar{Y} \bar{n} \bar{C}^3 \bar{C} \bar{I} \bar{E} \bar{C} \bar{U} \bar{I} \bar{A} \bar{i}^3 \bar{u}^3 \bar{Y}^3 \bar{I} \bar{A} : \bar{u} \bar{a} \bar{n} \bar{U}^3 \bar{E} \bar{Y} \bar{i}^3 \bar{n}^3 \cdot \bar{n} \bar{i}^3 \bar{I} \bar{B} \bar{O} \bar{A}^3 \bar{Y} \bar{I} \bar{E} \bar{C} \bar{Y} \bar{C} .$

$i_t^{I \bar{a} B i} > i_t^{O \bar{I} \bar{a} o Y} \Rightarrow c_t^{I \bar{a} B i} < c_t^{O \bar{I} \bar{a} o Y} , y_t^{I \bar{a} B i} < y_t^{O \bar{I} \bar{a} o Y} \Rightarrow n_t^{I \bar{a} B i} < n_t^{O \bar{I} \bar{a} o Y}$

⁶ $\bar{O} \bar{a} + \bar{a} \bar{E}^3 \bar{I}^3 \bar{Y} \bar{C} \bar{i} \bar{n} \bar{a} \bar{o} \bar{U} \bar{Y} \bar{B} \bar{i} \bar{a} \bar{o} \bar{U} \bar{C} , \bar{A} \bar{A} \bar{U} \bar{I} \bar{U}^3 \bar{E}^3 \bar{n} \bar{A} \gg \bar{u} \bar{A} \bar{a} \bar{n} \bar{U} \bar{a}^3 \bar{E} \bar{C} \bar{Y} \bar{C} \bar{i} \bar{n} \bar{C} \bar{u} \bar{n} \bar{a} \bar{o} \bar{U} \bar{I} \bar{a} \bar{B} \bar{i} , \bar{A} \bar{A} \bar{U} \bar{I} \bar{a} \bar{o} \bar{Y}^3 \bar{B} \bar{E}^3 \bar{i}^3 \bar{i}^3 \bar{n} \bar{o} \bar{n} \bar{a} \bar{i} :$

êi³ ói»ó, añ i Yi »e³ İ³ Ý ÷ á÷ áĒáoĀĬáoYÝ»ñÇ Ýİ³ i Û³ Ûµ³ ßĒ³ i³ i³ nõ»ñÇ Ýi³ ½
 ½³ ĬáoYáoĀŪ³ Ý Ñ»i³ ³ Ýúái³ i³ ĒÇ ß³ i³ ßĒ³ i³ áOÝ»ñ »Ý Ñ³ Ūi³ Ýi³ áoŪ . añİ³ ¼áoñİÇ
 İ³ ñ³ i³ Ç×³ İáoŪ: ² ßĒ³ i³ i³ nõ»ñÇ ×İáoYáoĀĬáoYÁ ĀáoĒĒ ĸ i³ ĒÇĒ ĒáoĒ³ ÷ »Ē³ Ūi³ ĩ³ óáoóÇá
 . añİ³ ¼ñİáoĀĬáoYÝó:

4.2. Ū»ñŪáoİi³ İ³ áñ³ ÝúY»ñÇ · Ý³ ×Ç Báİ (¶İ³ Ýİ³ ñ²)

Ū»ñŪáoİi³ İ³ áñ³ ÝúY»ñÇ · Ý»ñÇ³ ×Á µ»ñáoŪ ĸ ÁY¹Ñ³ Yáoñ . Ý»ñÇ Ū³ İ³ ñ¹³ İÇ (ê¶Ē)³ ×Ç:
 ² nõ³ Ý³ · ñi³ İ · Ý³ ×ÇÝİ´ -Ý³ nõ³ · ³ ÝúáoŪ ĸ i³ áİáĒ³ ¹ñáoŪY»ñÇ µ³ nõñ³ óŪ³ Ūµ: àñá»Ē
 İÇñ³ éiáŪ ¹ñ³ Ū³ i³ ñİ³ ŪÇÝ ū³ Ū³ ū³ İ³ YáoĀŪ³ Ý Ñ»i³ ³ Ýú` i³ »ŪÇ ĸ áOÝ»YáoŪ Ēá³ ĒŪ³ Ý
 İñ×³ i³ áoŪ ÷ áĒ³ Ý³ İ³ ŪÇÝ İáoñĒÇ Ýi³ ¼áoŪ (³ ñĀ»añiáoŪ ĸ ½³ ŪÇÝ³ ñĀáoŪĀ):

³ óÇ³ Ūi³ i³ áİáĒ³ ¹ñáoŪÇ µ³ nõñ³ óáoŪÁ³ ñĀ»añáoŪ ĸ Ý³ · Çñ³ İ³ Ý ÷ áĒ³ ñĀ»ùÁ: Ēñ³ İ³ Ý
 ÷ áĒ³ ñĀ»ùÇ³ ñĀ»añáoŪÁ Ñ³ Ý. »óYáoŪ ĸ ³ ñi³ ūÇÝ ŪñóáoY³ İáoĀŪ³ Ý³ ÝİŪ³ Ý.
 ³ ñi³ Ñ³ YáoŪÁ İñ×³ i³ iáoŪ ĸ: i³ Yi³ »éáoĀĬáoYáoŪ Ēá³ ĒŪ³ Ý İñ×³ i³ Ū³ Ý · Çñ³ İ³ Ý
 ÷ áĒ³ ñĀ»ùÇ³ ñĀ»añŪ³ Ý Ñ»i³ ³ Ýúái³ Çñ³ İ³ Ý ĐŪ² -Ý İñ×³ i³ iáoŪ ĸ: ĀáoŪ³ ñİŪ³ Ý
 İ³ i³ ĒY»ñÇ Ýi³ ¼Ū³ Ý Ñ»i³ ³ Ýúái³ İñ×³ i³ iáoŪ ĸ ³ ßĒ³ i³ Ýú³ ŪÇÝ é»éáoñĒY»ñÇ Ñ³ Ý¹»á
 á³ Ñ³ ÝÇ³ ñİÁ: ê³ Ýß³ Ý³ İáoŪ ĸ, añ i Yi³ »éáoĀĬáoYáoŪ Ýi³ ¼áoŪ ĸ ¼µ³ Ūi³ İY»ñÇ
 Āi³ ū³ Ý³ İÁ · ŪÇÇÇÝ³ ßĒ³ i³ i³ nõ»ñÇ Ū³ İ³ ñ¹³ İÁ: ² ½³ ŪÇÝ³ ñĀáoŪĀÇ³ ñĀ»añáoŪÁ Çñ
 Ñ»ñĀÇÝ Ēáñ³ óYáoŪ ĸ Ý»ñŪáoİŪ³ Ý · Ý»ñÇ³ ×ái³ á³ Ū³ Ý³ i³ añi³ İ Ū»İ · ÝÇ ūñ»YúÇó
 ³ é³ ç³ ó³ İ ß»ŪáoŪÁ: Ūİ³ i³ »Yú, añ Ū»İ · ÝÇ ūñ»YúÇó µ³ ó³ Ē³ İ³ Ý ß»ŪŪ³ Ý³ éİ³ ĬáoĀĬáoYÁ
 ÷ áñ-ÇYá ĀáoĒ³ óYáoŪ ĸ Çñ³ İ³ Ý ÷ áĒ³ ñĀ»ùÇ³ ÷ á÷ áĒáoĀŪ³ Ý³ ½¹»óáoĀĬáoYÁ³ ŪµáoÇ³ İ³ Ý
 á³ Ñ³ ÝÇ³ ñİÇ i³ ñ³ 7:

İ´ İáoŪÇó i³ áİáĒ³ ¹ñáoŪÇ µ³ nõñ³ óáoŪÁ Ý»ñŪáoİi³ İ³ áñ³ ÝúY»ñÇ · Ý»ñÇ³ Ýi³ ¼Ū³ Ý i³ ñ³
 ×ÝBáoŪY»ñ ĸ ³ é³ ç µ»ñáoŪ ³ ½³ ŪÇÝ³ ñĀáoŪĀÇ³ ñĀ»añŪ³ Ý ŪÇÇáoái, Ýi³ ¼áoŪ ĸ Ý»ñŪáoİáo
 ýÇñŪ³ Ý»ñÇ Çñ³ İ³ Ý Ē³ ÑŪ³ Ý³ ŪÇÝ İ³ ĒĒ»ñĀ, Ñ»i³ ³ µ³ ñ³ Ý³ · Ý»ñŪáoİi³ İ³ áñ³ ÝúY»ñÇ
 · Ý»ñÇ Ū³ İ³ ñ¹³ İÁ:

² ßĒ³ i³ áoĀÇ · Ēá³ ĒŪ³ Ý ŪÇÇ · ÷ áĒ³ ñÇYŪ³ Ý Ē³ ÑŪ³ Ý³ ŪÇÝ YáñŪÁ İñ×³ i³ iáoŪ ĸ Ēá³ ĒŪ³ Ý ·
 ³ ßĒ³ i³ Á³ Ū³ Ý³ İÇ İñ×³ i³ Ū³ Ý Ñ»i³ ³ Ýúái³:

ŪİáoY³ ßĒ³ i³ i³ nõ»ñÇ ¹»áúáoŪ á³ Ñá³ ÝiáoŪ ĸ ³ ßĒ³ i³ áoĀÇ · Ēá³ ĒŪ³ Ý ÷ áĒ³ ñÇYŪ³ Ý
 Ý»ñĀ³ Ū³ Ý³ İ³ ŪÇÝ á³ Ū³ YÁ, ³ ŪY ĸ w_i - p_i = mrs_i, añÇó Ñ»i³ ³ áoŪ ĸ, añ Ēá³ ĒŪ³ Ý ·
 ³ ßĒ³ i³ Á³ Ū³ Ý³ İÇ İñ×³ i³ áoŪÁ Ñ³ Ý. »óYáoŪ ĸ Çñ³ İ³ Ý³ ßĒ³ i³ i³ nõ»ñÇ İñ×³ i³ Ū³ Ý:

ŪĬáoĒ İáoŪÇó, İábİ³ ßĒ³ i³ i³ nõ»ñáí Ūá¹»ĒáoŪ³ ×áoŪ ĸ ³ ßĒ³ i³ i³ nõ»ñÇ Ñ³ i³ Ē³ ÇñĀ,
 ÇYáÁ Ñ³ Ū³ Ó³ ŪY³ ßĒ³ i³ i³ nõ»ñÇ Yáñ»ŪYĒŪ³ Ý ūÇĒÇáĒÇ İáñÇ µ»ñáoŪ ĸ
 ³ ßĒ³ i³ i³ nõ»ñÇ Ū³ İ³ ñ¹³ İÇ İñ×³ i³ Ū³ Ý: ² ßĒ³ i³ i³ nõ»ñÇ İñ×³ i³ Ū³ Ūµ

7 Ø»İY³ µ³ YáoĀĬáoYÁ i³ »Ē 4.1-áoŪ:
 8 éİ¼µY³ á»Ē Ý»ñŪáoİi³ İ³ áñ³ ÝúY»ñÇ · Ý»ñÇ³ × i³ »ŪÇ áOÝ»ó³ i³, añÇó Ñ»i³ á İ´ -Ý Çñ · añİ³ áoĀĬáoYÝ»ñáí³ ×³ İ · Ý»ñÇ
 i³ ñ³ Ýi³ ¼Ū³ Ý áoŪáoŪ³ Ūµ ×ÝBáoŪY»ñ³ é³ ç µ»ñ»ó:

á³ Ū³ Ý³ í áñí³ Í Ýí³ ½áò ù ĸ Çñ³ Ĩ³ Ý ë³ ÑÙ³ Ý³ ŪÝ Í³ Èë»ñÁ, ÇÝÁÝ ĸÉµ»ñáò ù ĸ³ á³ .³ Ūáò ù
.Ý»ñÇ³ ÝÍ Ù³ Ý Ñ³ Ù³ Ó³ ŪÝ ù ÇĸÇàèÇ Í áñÇ:

Î ábi .. xÍáòÝ³ BE³ i³ i³ ñÓ»ñái Úá¹»ÉÝ»ñÇ Ñ³ Ù»Ù³ i³ áoÁŪáoÝ: ÜÍ³ i³ »Yù, áñ Íábi
³ BE³ i³ i³ ñÓ»ñÇ á³ ñ³ .³ Ūáò ù ³ BE³ i³ i³ ñÓ»ñÇ Ù³ Ĩ³ ñ¹³ ÍÁ Ñ³ Ù»Ù³ i³ µ³ ñ ù Çà ĸ
Ĩñ×³ i³ í áò ù, áñÝ Çñ Ñ»ñÁÇÝ ÝB³ Ý³ Í áò ù ĸ³ í »ĸÇ µ³ ñÓñ Çñ³ Ĩ³ Ý ë³ ÑÙ³ Ý³ ŪÝ Í³ Èë»ñ
 $w_t^{Íábi} > w_t^{ÓÍáòÝ} \Rightarrow mc_t^{Íábi} > mc_t^{ÓÍáòÝ}$.. Ñ»i³ ..³ µ³ ñ Ñ³ Ù³ Ó³ ŪÝ .Ý³ ×Ç ù ÇĸÇàèÇ Í áñÇ` Ý³ ..³ í »ĸÇ
µ³ ñÓñ Ý»ñùÇÝ .Ý»ñ: àðèi Ç Ñ³ Ù³ Ó³ ŪÝ ¹ñ³ Ù³ í³ ñĨ³ ŪÝ ù³ Õ³ ù³ Ĩ³ ÝáoÁŪ³ Ý Í³ ÝáÝÇ` Í´ -
Ý Íábi ³ BE³ i³ i³ ñÓÇ ¹»àúáò ù ë³ ÑÙ³ Ýáò ù ĸ³ í »ĸÇ µ³ ñÓñ i³ áíáë³ ¹ñáòŪÝ»ñÇ
Ù³ Ĩ³ ñ¹³ Ĩ´ i³ ñ»Ēái³ i³ »ĸÇ ½èàáó³ Ĩ³ Ý ù³ Õ³ ù³ Ĩ³ ÝáoÁŪáoÝ: è³ Çñ Ñ»ñÁÇÝ ÝÍ³ i³ »ĸÇ
Èáñ³ óÝáò ù ĸ³ èà³ èÙ³ Ý³ ÝÍáòŪÁ (Ñ»i³ ..³ µ³ ñ Ý³ .. ÑÙ²-Ç) ` Á»Á³ ĨÇ³ ½¹»Ēái³ Ý³ ..
³ Ýí³ Ý³ Ĩ³ Ý ÷ áÈ³ ñÁ»ùÇ³ íñ³: Í ábi ³ BE³ i³ i³ ñÓ»ñÇ ¹»àúáò ù ÑÙ²-Ç³ i³ »ĸÇ Ù»Í
³ ÝÍáòŪÁ µ»ñáò ù ĸ³ ¼µ³ Õí³ ÍÝ»ñÇ³ i³ »ĸÇ Ù»Í Ĩñ×³ i³ Ù³ Ý:

$$\text{ÜÍ³ ñ³} \cdot \text{ñí³ Í} \text{ BÖÁ³ Ý} \cdot \cdot i_t^{Íábi} > i_t^{ÓÍáòÝ} \Rightarrow c_t^{Íábi} < c_t^{ÓÍáòÝ}, y_t^{Íábi} < y_t^{ÓÍáòÝ} \Rightarrow n_t^{Íábi} < n_t^{ÓÍáòÝ}$$

² ŪèàÇéái, Íábi ³ BE³ i³ i³ ñÓ»ñÇ ¹»àúáò ù Ý»ñùáóí³ Í³ Í³ áñ³ ÝùÝ»ñÇ .Ý³ ×Ç³ ¹ñ³ Ĩ³ Ý
BáĨÇ Ñ»i³ ..³ Ýúái³ È³ È³ í³ Í Ñ³ í³ ë³ ñ³ ĨéáoÁŪ³ Ý í»ñ³ Ĩ³ Ý. ÝÙ³ Ý .áñÍÁÝÁ³ óÇ
èĨ ¼µÝ³ Ĩ³ Ý ÷ áóĒá áóð»Íóíáò ù ĸ³ ÑÙ²-Ç³ i³ »ĸÇ Ĩ³ í áóĨ³ ÝÍ Ù³ Ùµ, ¼µ³ Õí³ ÍÝ»ñÇ³ i³ »ĸÇ Ù»Í
Ĩñ×³ i³ Ù³ Ùµ, ³ BE³ i³ i³ ñÓ»ñÇ áó .Ý»ñÇ³ i³ »ĸÇ µ³ ñÓñ Ù³ Ĩ³ ñ¹³ Íáí:

4.3. ² BE³ i³ i³ ñÓ»ñÇ ÇÝýĒ³ óÇ³ ŪÇ Bái (¶ Í³ ÝÍ³ ñ³)

í í Ū³ É ¹»àúáò ù ùÝÝ³ ñĨíáò ù ĸ³ ŪÇ³ ŪÝ Í ábi ³ BE³ i³ i³ ñÓ»ñái Úá¹»ĸÇ ÷ á÷ áÈ³ Ĩ³ ÝÝ»ñÇ
¹ÇÝ³ ŪÇÍ³ Ý, ù³ ÝÇ áñ ×ÍáòÝ³ BE³ i³ i³ ñÓ»ñái Úá¹»Ēáò ù ³ BE³ i³ i³ ñÓ»ñÝ³ ÝÙÇÇ³ á»è
×B. ñi³ í áò ù »Ý . ñ³ Ýóí³ Í óÝóÙ³ ÝÁ Ñ³ Ù³ á³ i³ ÷ èÈ³ Ý, ³ ŪèÇÝùÝ µáĒñ ÷ á÷ áÈ³ Ĩ³ ÝÝ»ñÁ
BáĨÇ á³ ÑÇÝ, Ñ»i³ ..³ µ³ ñ Ý³ .. Ñ»i³ .³ Ūáò ù . i³ Ýí áò ù »Ý Çñ»Ýó Í³ ŪáòÝ í Ç×³ Í áò ù:

² BE³ i³ i³ ñÓ»ñÇ³ ×Á Ñ³ Ý. »óÝáò ù ĸ³ Ý»ñùÇÝ ýÇñÙ³ Ý»ñÇ Çñ³ Ĩ³ Ý ë³ ÑÙ³ Ý³ ŪÝ Í³ Èë»ñÇ
³ ×Ç: Ñ³ Ù³ Ó³ ŪÝ .Ý³ ×Ç ù ÇĸÇàèÇ Í áñÇ` Ý»ñùÇÝ .Ý»ñÁ èĨéáò ù »Ý³ ×»É Ù»ñùÇÝ .Ý»ñÇ³ ×Á
µ»ñáò ù ĸ³ ÁÝ¹Ñ³ Ýáòñ .Ý»ñÇ Ù³ Ĩ³ ñ¹³ ĨÇ (è¶Ē)³ ×Ç: Í´ -Ý, ³ ñÓ³ .³ Ýù»Ēái³ Ý»ñùÇÝ .Ý»ñÇ
³ ×ÇÝ, µ³ ñÓñ³ óÝáò ù ĸ³ i³ áíáë³ ¹ñáòŪÁ, áñÇ Ñ»i³ ..³ Ýúái³ èà³ éáòŪÁ Ĩñ×³ i³ í áò ù ĸ³ ÇèĨ
³ ½³ ŪÝ³ ñÁáòŪÁ³ ñÁ»áñíáò ù:

ø³ ÝÇ áñ³ ½³ ŪÝ³ ñÁáòŪÇ³ Ýí³ Ý³ Ĩ³ Ý³ ñÁ»áñáòŪÇó µ³ óÇ³ ×áò ù »Ý Ý³ .. ÁÝ¹Ñ³ Ýáòñ
.Ý»ñÁ, ³ á³ Çñ³ Ĩ³ Ý ÷ áÈ³ ñÁ»ùÁ ĨèĨèÇ³ ñÁ»áñí»É³ í »ĸÇ Ù»Í á³ ÷ áí, ù³ Ý³ Ýí³ Ý³ Ĩ³ Ý
÷ áÈ³ ñÁ»ùÁ: Í´ ÍáòŪÇó i³ áíáë³ ¹ñáòŪÇ µ³ ñÓñ³ óáòŪÁ³ ½³ ŪÝ³ ñÁáòŪÇ³ ñÁ»áñŪ³ Ý
ŪÇÇáóái³ é³ ç³ óÝáò ù ĸ³ B»Óáò ù Ù»Í .ÝÇ ùñ»ÝùÇó: Æñ³ Ĩ³ Ý ÷ áÈ³ ñÁ»ùÇ³ ñÁ»áñŪ³ Ý
Ñ»i³ ..³ Ýúái³ ÁÝÍÝáò ù ĸ³ i³ Ýí »éáoÁŪ³ Ý ŪñóáòÝ³ Í áóÁŪáoÝÁ. ñi³ Ñ³ ÝáòŪÁ Ýí³ ½áò ù ĸ³ Æñ³ Ĩ³ Ý
÷ áÈ³ ñÁ»ùÇ³ ñÁ»áñáòŪÁ .. èà³ èÙ³ Ý Ĩñ×³ i³ áòŪÁ Ñ³ Ý. »óÝáò ù »Ý³ ùµáòÇ³ Ĩ³ Ý

$a^3 \tilde{N}^3 Y_{\zeta}^3 \tilde{n} \dot{\zeta} \tilde{I} \tilde{n} \times^3 i \dot{U}^3 Y \dot{A}$: $\tilde{A} \tilde{n}^3 \dot{I}^3 Y + \dot{a} \dot{E}^3 \tilde{n} \dot{A} \gg \dot{u} \zeta^3 \frac{1}{2} \gg \acute{o} \acute{a} \acute{o} \tilde{A} \tilde{U} \acute{o} \dot{Y} \dot{A} \dot{D} \dot{U}^2 - \zeta \dot{i} \tilde{n}^3 + \acute{a} \dot{u} \tilde{n} - \zeta \dot{Y} \dot{a}$
 $\dot{U} \gg \dot{O} \dot{U}^3 Y \acute{a} \dot{o} \dot{U} \dot{\zeta} \dot{a}^3 \tilde{U}^3 Y^3 \acute{i} \acute{a} \tilde{n} \dot{\zeta} \dot{I} \dot{U} \gg \dot{I} \cdot Y_{\zeta} \dot{u} \tilde{n} \gg Y \dot{u} \zeta \acute{o} \beta \gg \dot{O} \dot{U}^3 Y^3 \acute{e} \dot{I}^3 \tilde{U} \acute{o} \tilde{A} \tilde{U}^3 \dot{U} \mu^9$: $\tilde{A} \acute{a} \tilde{O}^3 \tilde{n} \dot{I} \dot{U}^3 Y$
 $\dot{I}^3 \acute{i}^3 \acute{E} \dot{Y} \gg \tilde{n} \zeta \tilde{I} \tilde{n} \times^3 i \acute{a} \dot{o} \dot{U} \dot{A} \mu \gg \tilde{n} \acute{a} \dot{o} \dot{U} \dot{\zeta}^3 \beta \dot{E}^3 i \acute{a} \dot{o} \dot{A} \zeta \tilde{N}^3 Y^1 \gg \acute{a} \dot{a}^3 \tilde{N}^3 Y_{\zeta}^3 \tilde{n} \dot{\zeta} Y \dot{i}^3 \frac{1}{2} \dot{U}^3 Y, \zeta \dot{Y} \acute{a} \dot{A}$
 $Y \beta^3 Y^3 \dot{I} \acute{a} \dot{o} \dot{U} \dot{\zeta} \frac{1}{4} \mu^3 \dot{O} \dot{i}^3 \dot{I} \acute{a} \dot{o} \tilde{A} \tilde{U}^3 Y \tilde{I} \tilde{n} \times^3 i \acute{a} \dot{o} \dot{U} \cdot \dot{U} \zeta \zeta Y^3 \beta \dot{E}^3 i^3 \acute{i}^3 \tilde{n} \acute{O} \gg \tilde{n} \zeta \dot{U}^3 \dot{I}^3 \tilde{n}^3 \dot{I} \zeta Y \dot{i}^3 \frac{1}{2} \acute{a} \dot{o} \dot{U}$:
 $\acute{a} Y^3 \dot{U}^3 \dot{I}^3 \frac{1}{2} \zeta Y^3 \tilde{n} \acute{A} \acute{o} \tilde{U} \tilde{A} \zeta^3 \tilde{n} \acute{A} \cdot \acute{a} \tilde{n} \dot{U}^3 Y \dot{A} \dot{Y} \gg \tilde{n} \dot{U} \acute{a} \acute{o} \dot{I} \acute{a} \acute{o} \acute{y} \zeta \tilde{n} \dot{U}^3 Y \gg \tilde{n} \zeta \zeta \tilde{n}^3 \dot{I}^3 Y \acute{e}^3 \tilde{N} \dot{U}^3 Y^3 \zeta Y$
 $\dot{I}^3 \dot{E} \acute{e} \gg \tilde{n} \acute{A} \acute{a} \gg Y \tilde{I} \tilde{n} \times^3 i \acute{i} \acute{a} \dot{o} \dot{U} \dot{a}^3 i \times^3 \acute{e} \dot{A} Y \gg \tilde{n} \dot{U} \zeta Y \acute{y} \zeta \tilde{n} \dot{U}^3 Y \gg \tilde{n} \zeta \mu^3 \tilde{n} \acute{o} \tilde{n} \zeta \tilde{n}^3 \dot{I}^3 Y \acute{e}^3 \tilde{N} \dot{U}^3 Y^3 \zeta Y$
 $\dot{I}^3 \dot{E} \acute{e} \gg \tilde{n} Y \gg Y (m_{\zeta} - Y)$: $\dot{D} \gg i^3 \cdot \zeta \tilde{U} \dot{a} \dot{O} \dot{U} \dot{U} \gg \dot{I}^3 \acute{a} \gg \acute{e} \dot{a}^3 \tilde{U}^3 Y^3 \acute{i} \acute{a} \tilde{n} \dot{\zeta} \dot{I} m_{\zeta} - \zeta \tilde{I} \tilde{n} \times^3 i \dot{U}^3 \dot{U} \mu$
 $Y \gg \tilde{n} \dot{U} \acute{a} \acute{o} \dot{I} \dot{U}^3 Y \cdot Y \gg \tilde{n} Y^3 \acute{e} \dot{i} \zeta \times^3 Y^3 \mu^3 \tilde{n} Y \dot{i}^3 \frac{1}{2} \acute{a} \dot{o} \dot{U} \gg Y$:

$\dot{O} \tilde{U} \acute{a} \acute{o} \acute{e} \dot{I} \acute{a} \dot{o} \dot{U} \zeta \acute{o}$, $\acute{e} \dot{a}^3 \acute{e} \dot{U}^3 Y \cdot \zeta \beta \dot{E}^3 i^3 \acute{A}^3 \dot{U}^3 Y^3 \dot{I} \zeta \tilde{I} \tilde{n} \times^3 i \dot{U}^3 Y \tilde{N} \gg i^3 \cdot \zeta Y \dot{u} \acute{a} \dot{i} Y \dot{i}^3 \frac{1}{2} \acute{a} \dot{o} \dot{U} \dot{\zeta}$
 $+ \dot{a} \dot{E}^3 \tilde{n} \zeta Y \dot{U}^3 Y \acute{e}^3 \tilde{N} \dot{U}^3 Y^3 \zeta Y Y \acute{a} \tilde{n} \dot{U} \dot{A}$:

$\dot{P} \acute{a} \dot{I} \zeta \dot{a}^3 \tilde{N} \zeta Y \dot{i} Y \dot{i} \gg \acute{e} \acute{a} \acute{o} \tilde{A} \tilde{U} \acute{o} Y \acute{a} \dot{o} \dot{U} \dot{U} \zeta \zeta Y^3 \beta \dot{E}^3 i^3 \acute{i}^3 \tilde{n} \acute{O} \gg \tilde{n} \zeta \tilde{N}^3 \dot{I}^3 \gg \acute{E}^3 \dot{I} \tilde{n} \zeta \beta \gg \dot{O} \acute{a} \dot{o} \dot{U} Y \zeta \tilde{n} \dot{I}^3 \tilde{U} \acute{o} Y$
 $\dot{i} \zeta \times^3 \dot{I} \zeta \acute{o} \dot{I} \tilde{n}^3 \dot{I}^3 Y \dot{\zeta} m_t^w > 0$, $\zeta \dot{Y} \acute{a} \dot{A} Y \beta^3 Y^3 \dot{I} \acute{a} \dot{o} \dot{U} \dot{\zeta}^3 \beta \dot{E}^3 i^3 \beta \acute{a} \acute{o} \dot{I}^3 \tilde{U} \acute{o} \dot{U} \zeta \dot{U}^1 \dot{a}^3 \tilde{N} \zeta Y^3 \acute{e} \dot{I}^3$
 $\tilde{N}^3 \dot{I}^3 \gg \acute{E}^3 \dot{I} \zeta \tilde{n} \acute{A} \cdot \gg \tilde{n}^3 \frac{1}{2} Y \acute{o} \acute{a} \dot{o} \dot{U} \dot{\zeta} \dot{U} \gg Y^3 \beta Y \acute{a} \tilde{n} \tilde{N}^3 \zeta Y \dot{U} \zeta \zeta^3 \acute{i}^3 \tilde{U} \acute{a} \dot{o} \dot{U} \tilde{N}^3 \dot{I}^3 \gg \acute{E}^3 \dot{I} \tilde{n} \zeta \acute{o}^3 Y \dot{i}^3 \acute{E} \zeta$
 $\dot{U}^3 \dot{I}^3 \tilde{n}^3 \dot{I} \acute{A}$: $\acute{e}^3 Y \beta^3 Y^3 \dot{I} \acute{a} \dot{o} \dot{U} \dot{\zeta}$, $\acute{a} \tilde{n}^3 \dot{a}^3 \cdot \zeta \tilde{U} \acute{o} \dot{U} \dot{i} Y^3 \zeta Y \dot{i} Y \dot{i} \gg \acute{e} \acute{a} \acute{o} \tilde{A} \tilde{U} \acute{o} Y \gg \tilde{n} \acute{A}$,
 $\tilde{N} Y^3 \tilde{n}^3 \acute{i} \acute{a} \tilde{n} \acute{a} \acute{o} \tilde{U} \tilde{U} \acute{o} Y \acute{e} \dot{i}^3 Y^3 \acute{E} \acute{a} \dot{i} \times \beta \cdot \tilde{n} \dot{i} \gg \acute{E} \acute{o}^3 \beta \dot{E}^3 i^3 \acute{i}^3 \tilde{n} \acute{O} \gg \tilde{n} \zeta \dot{U}^3 \dot{I}^3 \tilde{n}^3 \dot{I} \acute{A} \tilde{N}^3 \dot{I} \dot{i}^3 \dot{I} \dot{I} \acute{E} Y \gg Y$
 $\acute{e}^3 \tilde{N} \dot{U}^3 Y \gg \acute{E} \acute{o}^3 \dot{i} \gg \acute{E} \zeta \acute{o}^3 \dot{I} \tilde{n}^3 \beta \dot{E}^3 i^3 \acute{i}^3 \tilde{n} \acute{O} \gg \tilde{n}$:

4.4. $\tilde{n} \dot{i} \gg \tilde{n} \dot{I} \tilde{n} \zeta \acute{e} \dot{a}^3 \acute{e} \dot{U}^3 Y \dot{I}^3 \dot{U} \zeta \tilde{n}^3 \dot{I}^3 Y \dot{D} \dot{U}^2 - \zeta \beta \acute{a} \dot{I} (\nabla \dot{I}^3 Y \dot{I}^3 \tilde{n} 4)$

$\acute{e} \zeta \acute{e} \dot{I} \gg \tilde{n} \zeta \mu^3 \beta \dot{E} \dot{U}^3 Y \dot{a}^3 \tilde{U}^3 Y \acute{a} \dot{i} Y \gg \tilde{n} \dot{U} \zeta Y \dot{i} Y \dot{i} \gg \acute{e} \acute{a} \acute{o} \tilde{A} \tilde{U}^3 Y \acute{e} \dot{a}^3 \acute{e} \acute{a} \dot{o} \dot{U} \acute{A}$, $\dot{I}^3 \dot{a}^3 \dot{I} \acute{o} \dot{i}^3 \dot{I} \acute{E} Y \gg \acute{E} \acute{a} \dot{i}$
 $\zeta \tilde{n} \dot{i} \gg \tilde{n} \dot{I} \tilde{n} \zeta \gg \dot{I}^3 \dot{U} \acute{a} \dot{o} \dot{i} Y \gg \tilde{n} \zeta \tilde{N} \gg i^3$, $\zeta \acute{x} \acute{a} \dot{o} \dot{U} \dot{\zeta} \dot{a}^3 \tilde{U}^3 Y^3 \acute{i} \acute{a} \tilde{n} \dot{\zeta} \dot{I}^3 \tilde{n} \dot{i} \gg \tilde{n} \dot{I} \tilde{n} \zeta \gg \dot{I}^3 \dot{U} \acute{a} \dot{o} \dot{i} Y \gg \tilde{n} \zeta \zeta \acute{x} \acute{a} \dot{i}$:
 $\tilde{n} \dot{i} \gg \tilde{n} \dot{I} \tilde{n} \zeta \acute{e} \dot{a}^3 \acute{e} \dot{U}^3 Y \dot{I}^3 \dot{U} \zeta \tilde{n}^3 \dot{I}^3 Y \dot{D} \dot{U}^2 - \zeta \beta \acute{a} \dot{I} \acute{A} \dot{U} \gg \dot{I}^3 \acute{o} Y \acute{a} \dot{o} \dot{U} \dot{\zeta} \tilde{n} \dot{i} \zeta \tilde{N}^3 Y \dot{U}^3 Y Y \dot{I}^3 i \dot{U}^3 \dot{U} \mu$
 $\dot{a}^3 \tilde{N}^3 Y_{\zeta}^3 \tilde{n} \dot{I} \acute{A}$: $\tilde{n} \dot{i} \zeta \tilde{N}^3 Y \dot{U}^3 Y \zeta \times Y \acute{A} \acute{e} \dot{i} \dot{\zeta} \acute{a} \dot{o} \tilde{A} \tilde{U}^3 Y \dot{i} Y \dot{i} \gg \acute{e} \acute{a} \acute{o} \tilde{A} \tilde{U}^3 Y \gg \dot{I}^3 \dot{U} \acute{a} \dot{o} \dot{i} Y \gg \tilde{n} \zeta \zeta \times \dot{\zeta}$
 $Y \beta^3 Y^3 \dot{I} \acute{a} \dot{o} \dot{U}$, $\acute{a} \tilde{n} \acute{A} \acute{e} \dot{a}^3 \acute{e} \dot{U}^3 Y^3 \times \zeta \tilde{N} \gg i^3 \dot{U} \gg \dot{I} \dot{i} \gg \dot{O} \mu \gg \tilde{n} \acute{a} \dot{o} \dot{U} \dot{\zeta} Y \gg \tilde{n} \dot{U} \zeta Y^3 \tilde{n} \dot{i} \zeta \tilde{n} \acute{a} \acute{o} \tilde{A} \tilde{U}^3 Y^3 \dot{a} \tilde{n}^3 Y \dot{u} Y \gg \tilde{n} \zeta$
 $Y \dot{I}^3 i \dot{U}^3 \dot{U} \mu \dot{a}^3 \tilde{N}^3 Y_{\zeta}^3 \tilde{n} \dot{\zeta} \zeta \times \zeta$: $\tilde{n}^1 \tilde{U} \acute{o} Y \dot{u} \acute{a} \dot{o} \dot{U} \zeta \acute{x} \acute{a} \dot{o} \dot{U} \dot{\zeta} \zeta \tilde{n}^3 \dot{I}^3 Y \dot{D} \dot{U}^2 - Y$: $\acute{e}^3 \zeta \tilde{n} \tilde{N} \gg \tilde{n} \tilde{A} \zeta Y$
 $\dot{U} \gg \dot{I}^3 \acute{o} Y \acute{a} \dot{o} \dot{U} \dot{\zeta}^3 \beta \dot{E}^3 i \acute{a} \dot{o} \dot{A} \zeta \tilde{N}^3 Y^1 \gg \acute{a} \dot{a}^3 \tilde{N}^3 Y_{\zeta}^3 \tilde{n} \dot{I} \acute{A} \tilde{N}^3 Y \cdot \gg \acute{o} Y \gg \acute{E} \acute{a} \dot{i} Y^3 \cdot \zeta \beta \dot{E}^3 i^3 \acute{i}^3 \tilde{n} \acute{O} \gg \tilde{n} \zeta$
 $\zeta \times \zeta$:

$\dot{O} \tilde{U} \acute{a} \acute{o} \acute{e} \dot{I} \acute{a} \dot{o} \dot{U} \zeta \acute{o}$, $\zeta \acute{x} \acute{a} \dot{o} \dot{U} \dot{\zeta} + \dot{a} \dot{E}^3 \tilde{n} \zeta Y \dot{U}^3 Y \acute{e}^3 \tilde{N} \dot{U}^3 Y^3 \zeta Y Y \acute{a} \tilde{n} \dot{U} \dot{A} \dot{e} \dot{a}^3 \acute{e} \dot{U}^3 Y \cdot$
 $\zeta \beta \dot{E}^3 i^3 \acute{A}^3 \dot{U}^3 Y^3 \dot{I} \zeta \zeta \acute{x} \acute{a} \dot{i} \dot{a}^3 \tilde{U}^3 Y^3 \acute{i} \acute{a} \tilde{n} \dot{\zeta} \dot{I}^3$:

$\dot{O} \dot{I} \acute{a} \dot{o} Y^3 \beta \dot{E}^3 i^3 \acute{i}^3 \tilde{n} \acute{O} \gg \tilde{n} \acute{a} \dot{i} \dot{U} \acute{a}^1 \gg \acute{E} \acute{o} \dot{U} w_t - p_t = mrs_t$, $\acute{a} \acute{o} \acute{e} \dot{i} \zeta + \dot{a} \dot{E}^3 \tilde{n} \zeta Y \dot{U}^3 Y \acute{e}^3 \tilde{N} \dot{U}^3 Y^3 \zeta Y$
 $Y \acute{a} \tilde{n} \dot{U} \zeta \zeta \acute{x} \acute{a} \dot{i} \dot{a}^3 \tilde{U}^3 Y^3 \acute{i} \acute{a} \tilde{n} \dot{\zeta} \dot{I}^3 \zeta \acute{x} \acute{a} \dot{o} \dot{U} \gg Y Y^3 \cdot \zeta \tilde{n}^3 \dot{I}^3 Y \acute{e}^3 \tilde{N} \dot{U}^3 Y^3 \zeta Y \dot{I}^3 \dot{E} \acute{e} \gg \tilde{n} \acute{A}$:

$\dot{I} \acute{a} \beta \dot{i} \zeta \beta \dot{E}^3 i^3 \acute{i}^3 \tilde{n} \acute{O} \gg \tilde{n} \acute{a} \dot{i} \dot{U} \acute{a}^1 \gg \acute{E} \acute{o} \dot{U} \zeta \beta \dot{E}^3 i^3 \acute{i}^3 \tilde{n} \acute{O} \gg \tilde{n} \zeta \tilde{N}^3 \dot{I}^3 \gg \acute{E}^3 \dot{I} \tilde{n} \zeta \mu^3 \acute{o}^3 \acute{e}^3 \dot{I}^3 Y \acute{E} Y \gg \acute{E} \acute{A}$
 $(m_t^w < 0) \mu \gg \tilde{n} \acute{a} \dot{o} \dot{U} \dot{\zeta}^3 \beta \dot{E}^3 i^3 \acute{i}^3 \tilde{n} \acute{O} \gg \tilde{n} \zeta \zeta \times \zeta$: $\dot{\zeta}^3 \tilde{n} \acute{O} \tilde{n} \zeta \beta \dot{E}^3 i^3 \acute{i}^3 \tilde{n} \acute{O} \gg \tilde{n} \acute{A} \tilde{N}^3 Y \cdot \gg \acute{o} Y \acute{a} \dot{o} \dot{U} \dot{\zeta} \mu^3 \tilde{n} \acute{O} \tilde{n}$

⁹ $\dot{O} \gg \dot{I} Y^3 \mu^3 Y \acute{a} \dot{o} \tilde{A} \tilde{U} \acute{o} Y \dot{A} 4.1 - \acute{a} \dot{o} \dot{U}$:

Çñ³ Ĩ³ Ý ë³ ÑÛ³ Ý³ ŨÝ Í³ Èë»ñÇ, ánÝ ĺÉ µ³ ñÓñ³ óÝáòÛ ĺ Ý»ñùÇÝ · Ý»ñÇ Û³ Ĩ³ ñ¹³ ĨÁ: Ĩ´-Ý
 ³ ñÓ³ Ý³ · ñí³ Í · Ý³ ×ÇÝ ³ ñÓ³ · ³ ÝúáòÛ ĺ ĩ áÍáë³ ¹ñáòÛÝ»ñÇ µ³ ñÓñ³ óÛ³ Ûµ, ³ ñ¹ÛáòÝúáòÛ
 ëà³ éáòÛÁ Ĩñ×³ ĩ íáòÛ ĺ, ³ ½³ ŨÝ³ ³ ñÁáòÛÁ` ³ ñÁ`ánaóÛ: ´³ óÇ ³ Ũ´ ĩ áÍáë³ ¹ñáòÛÇ
 µ³ ñÓñ³ óáòÛÁ ³ ñÁ`ánaóÛ ĺ Ý³ · Çñ³ Ĩ³ Ý ÷ áÈ³ ñÁ»úÁ: Æñ³ Ĩ³ Ý ÷ áÈ³ ñÁ»úÇ ³ ñÁ`ánaóÛÁ
 ½ëàáòÛ ĺ ëà³ éÛ³ Ý · Çñ³ Ĩ³ Ý ÐÛ²-Ç ³ ×Á: Û»ñÚáóÍ í³ Í ³ àñ³ ÝúÝ»ñÇ · Ý»ñÁ³ ĩ»ÉÇ ÁáòÛÉ»Ý
 ³ ñÓ³ · ³ ÝúáòÛ ÷ áÈ³ ñÁ»úÇ ³ ñÁ`ánÛ³ ÝÁ, ù³ ÝÇ án³ ßÈ³ ĩ³ ĩ³ ñÓ»ñÇ ³ ×Á Ñ³ Ý · »óñ»É ĺ
 Ý»ñùÇÝ ýÇñÛ³ Ý»ñÇ, áöë ĺ Ý³ · Ý»ñÚáóÍ áó ýÇñÛ³ Ý»ñÇ Çñ³ Ĩ³ Ý ë³ ÑÛ³ Ý³ ŨÝ Í³ Èë»ñÇ
 ³ ×Ç:

óáÈ³ ñÁ»úÇ ³ ñÁ`ánaóÛÁ · Ý»ñÚáóÍ Û³ Ý · Ý»ñÇ ³ ×Á µ»ñáòÛ ĺ ß»ÓáòÛ Û»Ĩ · ÝÇ ùñ»ÝúÇó:
 Æñ³ Ĩ³ Ý ÐÛ²-Ç ³ ×Ý³ ĩ»ÉÇ Û»Ĩ ĺ ĺÇÝáòÛ, ù³ Ý ĨÉÝ»ñ, »Á» Û»Ĩ · ÝÇ ùñ»ÝúÁ à³ Ñà³ Ýí»ñ:

Ĩ áβ ĩ · ×ĨáóÝ ³ ßÈ³ ĩ³ ĩ³ ñÓ»ñÁÍ Úá¹»ÉÝ»ñÇ Ñ³ Û»Û³ ĩ áóÁÛáóÝ: ÛĨ³ ĩ»Ýú, án Ĩ áβ ĩ
 ³ ßÈ³ ĩ³ ĩ³ ñÓ»ñÇ à³ ñ³ · ³ ŨáòÛ ³ ßÈ³ ĩ³ ĩ³ ñÓ»ñÝ³ ĩ»ÉÇ ùÇà»Ý³ ×áòÛ $w_t^{Ĩáβ ĩ} < w_t^{ÓĨáóÝ}$, ÇÝÁÁ

Ýß³ Ý³ ĨáòÛ ĺ Ý»ñùÇÝ Çñ³ Ĩ³ Ý ë³ ÑÛ³ Ý³ ŨÝ Í³ Èë»ñÇ $mc_t^{Ĩáβ ĩ} < mc_t^{ÓĨáóÝ}$, Ñ»Ĩ³ · ³ à»ë Ý»ñùÇÝ
 ³ ñĨ³ ³ ñáòÁÛ³ Ý · Ý»ñÚáóÍ í³ Í ³ àñ³ ÝúÝ»ñÇ · Ý»ñÇ Ñ³ ñ³ µ»ñ³ Ĩ³ Ýáñ»Ý ó³ Ĩñ Û³ Ĩ³ ñ¹³ Ĩ:
 àöë ĺ Ĩ´-Ý ³ ĩ»ÉÇ Û»Û ù³ Ó³ ù³ Ĩ³ ÝáóÁÛáóÝ ĺ ĩ³ ñáòÛ`

$$l_t^{Ĩáβ ĩ} < l_t^{ÓĨáóÝ} \Rightarrow c_t^{Ĩáβ ĩ} > c_t^{ÓĨáóÝ}, y_t^{Ĩáβ ĩ} > y_t^{ÓĨáóÝ} \Rightarrow n_t^{Ĩáβ ĩ} > n_t^{ÓĨáóÝ} :$$

² ñ¹ÛáòÝúáòÛ ëĨ³ óí»ó, án Ñ³ ĩ³ ë³ ñ³ ĨéáóÁÛ³ Ý ĩ»ñ³ Ĩ³ Ý · ÝÛ³ Ý · ánÍÁÝÁ³ óÁ Ĩ áβ ĩ
 ³ ßÈ³ ĩ³ ĩ³ ñÓ»ñÇ à³ ñ³ · ³ ŨáòÛ áóÛ»Ĩ íáòÛ ĺ ĩ³ ĩ»ÉÇ µ³ ñÓñ³ ëà³ éÛ³ Ý · Çñ³ Ĩ³ Ý ÐÛ²-Ç
 Û³ Ĩ³ ñ¹³ Ĩáí: ¶ ánÍ»ó à³ Ñ³ ÝÇ³ ñĨÇ ùñ»ÝúÁ. ×ĨáóÝ ³ ßÈ³ ĩ³ ĩ³ ñÓ»ñÇ ¹»àúáòÛ ³ ĩ»ÉÇ
 µ³ ñÓñ³ ßÈ³ ĩ³ ĩ³ ñÓ»ñÁ µ»ñ»óÇÝ³ ĩ»ÉÇ ó³ Ĩñ ¼µ³ ÓĨ³ ĨáóÁÛ³ Ý:

4.5. Ĩ áÍáë³ ¹ñáòÛÇ ßáĨ (¶ Ĩ³ ÝĨ³ ñ 5)

Ĩ áÍáë³ ¹ñáòÛÇ ññ³ Ĩ³ Ý ßáĨÁ Ĩñ×³ ĩ áòÛ ĺ ëà³ éáòÛÁ · ³ ñÁ`ánaóÛ ÷ áÈ³ ñÁ»úÁ: Æñ³ Ĩ³ Ý
 ÷ áÈ³ ñÁ»úÇ ³ ñÁ`ánaóÛÁ Ĩñ×³ ĩ áòÛ ĺ ³ ñĨ³ ùÇÝ · Ý»ñùÇÝ ÛñóáóÝ³ ĨáóÁÛáóÝÁ. Ýí³ ½áòÛ ĺ
 ³ ñĨ³ Ñ³ ÝÛ³ Ý Í³ ĩ³ ÉÝ»ñÁ · Ý»ñùÇÝ ³ àñ³ ÝúÝ»ñÇ ÝĨ³ ĩ Û³ Ûµ Ñ³ ñ³ µ»ñ³ Ĩ³ Ý
 à³ Ñ³ ÝÇ³ ñĨÁ: Ûβ Ĩ³ Í ÷ á÷ áÈáóÁÛáóÝ»ñÁ Çñ³ Ĩ³ Ý ÐÛ²-Ç Ĩñ³ ³ ½¹áòÛ »Ý Ýí³ ¼Û³ Ý
 áóÛÓáóÁÛ³ Ûµ: ² ñ¹ÛáòÝúáòÛ ýÇñÛ³ Ý»ñÁ Ĩñ×³ ĩ áòÛ »Ý³ ßÈ³ ĩ³ áóÁÇ à³ Ñ³ ÝÇ³ ñĨÁ, ÇÝáÇó
 Ñ»Ĩ³ · áòÛ ĺ, án Ĩñ×³ ĩ íáòÛ ĺ ¼µ³ ÓĨ³ ĨáóÁÛáóÝÁ · ³ ßÈ³ ĩ³ ĩ³ ñÓ»ñÇ Û³ Ĩ³ ñ¹³ ĨÁ:

ØÛáöë ĨáóÛÇó, Ýí³ ½áòÛ ĺ ³ ßÈ³ ĩ³ áóÁÇ · ëà³ éÛ³ Ý ÷ áÈ³ ñÇÝÛ³ Ý ë³ ÑÛ³ Ý³ ŨÝ ÝáñÚÁ, ù³ ÝÇ
 án Ĩñ×³ ĩ ĩ»É ĺ ëà³ éáòÛÁ · ³ ßÈ³ ĩ³ Á³ Û³ Ý³ ĨÁ:

, ñ³ Ĩ³ Ý³ ßÈ³ ĩ³ ĩ³ ñÓ»ñÇ Ñ³ ĩ»É³ ¹ÇñÁ ($m_t^v > 0$) µ»ñáòÛ ĺ ³ ßÈ³ ĩ³ ĩ³ ñÓ»ñÇ Ĩñ×³ ĩ Û³ Ý:
 ² ßÈ³ ĩ³ ĩ³ ñÓ»ñÇ Ĩñ×³ ĩ Û³ Ûµ à³ Û³ Ý³ íáñ³ Í Ĩñ×³ ĩ íáòÛ ĺ Çñ³ Ĩ³ Ý ë³ ÑÛ³ Ý³ ŨÝ
 Í³ Èë»ñÁ, Ñ»Ĩ³ · ³ µ³ ñ Ý³ · Ý»ñùÇÝ · Ý»ñÁ:

· 3 óÇ 3 Ū¹ ÷ áĚ³ nĀ»ùÇ 3 nĀ»ánŪ³ Ý · Ý»ñùÇÝ Çñ³ Ī³ Ý ě³ NŪ³ Ý³ ŪÇÝ Ī³ Ěë»ñÇ Īñ³ i Ū³ Ý³ n¹ŪáoŸúáoŪ Ý¹ 3 ½áoŪ ĸ Ý»ñŪáoĪ áŌ yÇñŪ³ Ý»ñÇ Çñ³ Ī³ Ý ě³ NŪ³ Ý³ ŪÇÝ Ī³ Ěë»ñĀ, áöëi Ç Ý³ · Ý»ñŪáoĪ Ū³ Ý · Ý»ñĀ:

öáĚ³ nĀ»ùÇ 3 nĀ»ánáoŪÁ μ»náóŪ ĸ Ū»Ī · ÝÇ ūñ»ÝùÇó μ³ ó³ ě³ Ī³ Ý β»ŌáoŪ, ÇëĪ Ý»ñŪáoĪ Ū³ Ý · Ý»ñÇ Īñ³ i áóŪÁ¹ n³ Ī³ Ý, ě³ Ī³ ŪÝ³ n¹ŪáoŸúáoŪ áóŸ»ÝáoŪ »Ýù μ³ ó³ ě³ Ī³ Ý β»ŌáoŪ, ù³ ÝÇ áñ ÷ áĚ³ nĀ»ùÇ 3 nĀ»ánáoŪÁ μ³ ó³ nŌ³ Ī³ nĀ»úái Ū»Ī ĸ Ý»ñŪáoĪ Ū³ Ý · Ý»ñÇ Īñ³ i áóŪÇó |s_t| > |p_t^m|: Āñ³ Ī³ Ý ĐŪ² -Ç 3 ÝĪáoŪÁ³ i»Ĳ ĸ ùÇā ĸ ĲÝáoŪ, ù³ Ý ĪĲÝ»ñ, »Ā» Ū»Ī · ÝÇ ūñ»ÝúÁ á³ Nā³ Ý¹»ñ:

ø³ ÝÇ áñ Ý»ñŪáoĪ Ū³ Ý · Ý»ñùÇÝ³ nñ³ 3 náoĀŪ³ Ý³ áñ³ ÝùÝ»ñÇ · Ý»ñĀ Ý¹ 3 ½»Ě»Ý, 3 á³ Ī¹ -Ý ÇÇ»óÝáoŪ ĸ i áĪáë³ náoŪŪÝ»ñĀ: , n³ Ū³ i³ nĪ³ ŪÇÝ ù³ Ō³ ù³ Ī³ ÝáoĀŪ³ Ý³ n¹ŪáoŸúÁ éá³ éŪ³ Ý³ ×Ý ĸ · 3 ½³ ŪÇÝ³ nĀáoŪĀÇ 3 nĀ»½ñĪáoŪÁ: Đ³ i³ ě³ n³ ĪbéáoĀŪáoŸÁ ëĪéáoŪ ĸ i»ñ³ Ī³ Ý · Ý¹»Ě³ 3 ½³ ŪÇÝ³ nĀáoŪĀÇ 3 nĀ»½ñĪ Ū³ Ý · éá³ éŪ³ Ý³ ×Ç ŪÇÇáoái:

Ī ábi · ×ĪáoŸ 3 BĚ³ i 3 i³ nŌ»ñái Ūá¹»ĚÝ»ñÇ N³ Ū»Ū³ i áóĀŪáoŸ: Ī ábi 3 BĚ³ i 3 i³ nŌ»ñÇ 1»àúáoŪ 3 BĚ³ i 3 i³ nŌ»ñĀ · N»i · 3 μ³ n³ Ý³ · Çñ³ Ī³ Ý ě³ NŪ³ Ý³ ŪÇÝ Ī³ Ěë»ñĀ 3 i»Ĳ ĸ ùÇā »Ý Ý¹ 3 ½áoŪ $w_t^{Īábi} > w_t^{ŌĪáoŸ} \Rightarrow mc_t^{Īábi} > mc_t^{ŌĪáoŸ}$: ě³ Ýβ³ Ý³ ĪáoŪ ĸ, áñ Ī ábi 3 BĚ³ i 3 i³ nŌ»ñÇ 1»àúáoŪ Ý»ñùÇÝ³ nñ³ 3 náoĀŪ³ Ý · Ý»ñŪáoĪ Ī³ Ī³ áñ³ ÝùÝ»ñÇ · Ý»ñĀ N³ n³ μ»ñ³ Ī³ Ýáñ»Ý μ³ nŌñ »Ý ŪÝáoŪ, áöëi Ç Ī¹ -Ý³ i»Ĳ ½éáŌ ù³ Ō³ ù³ Ī³ ÝáoĀŪáoŸ ĸ i³ náoŪ:

$$i_t^{Īábi} > i_t^{ŌĪáoŸ} \Rightarrow c_t^{Īábi} < c_t^{ŌĪáoŸ}, y_t^{Īábi} < y_t^{ŌĪáoŸ} \Rightarrow n_t^{Īábi} < n_t^{ŌĪáoŸ} :$$

Ī ábi 3 BĚ³ i 3 i³ nŌ»ñái Ūá¹»ĚáoŪ 3 i»Ĳ ĸ ùÇā · Ý³ ÝĪŪ³ Ý á³ n³ · 3 ŪáoŪ i áĪáë³ náoŪŪÝ»ñÇ 3 i»Ĳ μ³ nŌñ ĲÝ»Ěáo N»i · 3 Ýúái N³ i³ ě³ n³ ĪbéáoĀŪ³ Ý i»ñ³ Ī³ Ý · ÝŪ³ Ý · áñĪÁÝÁ³ óÁ ÁÝÁ³ ÝáoŪ ĸ 3 i»Ĳ ó³ Īñ éá³ éŪ³ Ý, ĐŪ² -Ç · ½³ Ōi³ ĪáoĀŪ³ Ý Ū³ Ī³ n¹³ Īái, ě³ Ī³ ŪÝ³ i»Ĳ μ³ nŌñ 3 BĚ³ i 3 i³ nŌ»ñái:

4.6. Øá¹»ĚÝ»ñÇ N³ Ū»Ū³ i áóĀŪáoŸ

öá÷ áĚ³ Ī³ ÝÝ»ñÇ ëi 3 Ý¹³ nñ β»ŌáoŪÝ»ñÇ N³ Ū»Ū³ i áóĀŪáoŸÁ (Đ³ i»Ĳ³ Ī 4) 3 Ū÷ á÷ Ī»ñáái Ý»ñĪ³ Ū³ óÝáoŪ · 3 i»Ĳ ÝĪ³ i»Ĳ ĸ 1³ nŌÝáoŪ »ñĪáo Ūá¹»ĚÝ»ñÇ i 3 nμ»ñáoĀŪáoŸÝ»ñĀ: Ø³ ěÝ³ íáñ³ á»ë, máĚñ BáĪ»ñÇ 1»àúáoŪ Ī ábi 3 BĚ³ i 3 i³ nŌ»ñái Ūá¹»ĚáoŪ 3 BĚ³ i 3 i³ nŌ»ñÇ ëi 3 Ý¹³ nñ β»ŌáoŪÁ 3 i»Ĳ ÷ áñ ĸ. ŪÇ»ÝáoŸÝ³ nñ 3 ùÇÝ³ 3 ½¹³ ĪÇ 1»àúáoŪ 3 BĚ³ i 3 i³ nŌ»ñÝ³ i»Ĳ ĸ ùÇā »Ý ÷ á÷ áĚ³ íáoŪ: ě³, ÇÝáá»ë 3 n¹»Ý · Ī³ ÝĪ³ n³ Ý»ñÇ ŪÇÇáoái i »ë³ Ýù, 3 ŪÝ³ 3 é³ Ýóú³ ŪÇÝ · áñĪÁÝÝ ĸ, áñÝ ĸ³ Ī³ Ý i 3 nμ»ñáoĀŪáoŸÝ»ñÇ ĸ N³ Ý · »óÝáoŪ »ñĪáo Ūá¹»ĚÝ»ñÇ N³ i³ ě³ n³ ĪbéáoĀŪ³ Ý i»ñ³ Ī³ Ý · ÝŪ³ Ý · áñĪÁÝÁ³ óÝ»ñáoŪ: Ī ábi 3 BĚ³ i 3 i³ nŌ»ñÇ 1»àúáoŪ Ūá¹»Ĳ³ ÝáoŪ³ ŪÇÝ³ 1ÇÝ³ ŪÇĪ³ Ý ĸ á»ë ÷ áĚ³ íáoŪ ĸ:

5. 0 1/2 n 3 I 3 ó á o ã Û á o Ý

2 BÈ 3 i 3 Ý u á o Ù I 3 é á o ó i » ó ÷ á u ñ μ 3 ó i Ý i » é á o ã Û 3 Ý D S G E Ù á 1 » É I á b i 3 BÈ 3 i 3 i 3 ñ Ó » ñ á i :
2 Ý I 3 i 3 ñ 3 BÈ 3 i 3 á o Æ Ç B á o I 3 Û Ç ù Ý Ý 3 ñ I Ù 3 Ù μ Ù á 1 » Æ Ç Ñ 3 Ù 3 á 3 i 3 è È 3 Ý á o ã Û á o Ý Á Ç ñ 3 I 3 Ý á o ã Û 3 Ý Á á ñ á ß 3 é á o Ù á i μ 3 ñ » È 3 í i » ó : 3 ó Ç 3 Ù 1 Ñ Ç Ù ù Á Ý 1 á o Ý » É á i 3 Ù Ý Ñ 3 Ý 3 Ù 3 Ý ù Á ,
á ñ ÷ 3 è i 3 ó Ç i Ý i » é á o ã Û á o Ý Ý » ñ á o Ù 3 BÈ 3 i 3 i 3 ñ Ó » ñ Ç I á b i á o ã Û á o Ý Á 3 Ý Ñ » ñ ù » Æ Ç » ñ » á o Û Á Ç ,
3 á 3 Ù » Í i è i 3 Ñ á o ã Û 3 Ù μ I 3 ñ » Æ Ç Ç á Ý 1 » É á ñ Ý Ù 3 Ý » Ý Á 3 1 ñ á o ã Û 3 Ù μ Á Ý 1 È 3 Ù Ý i 3 Í Ù á 1 » É Ý
3 é 3 í » É Ç ñ 3 i » è 3 I 3 Ý Ç 3 i » Æ Ç Ù » Í Ñ 3 i 3 Ý 3 I 3 Ý á o ã Û 3 Ù μ á o Ý 3 I I Æ Ç Ý Ç Ý I 3 ñ 3 . ñ » È
i Ý i » é á o ã Û á o Ý á o Ù Á Ý Á 3 ó á Õ . á ñ I Á Ý Á 3 ó Ý » ñ Á :

2 Ù Ý Ý á ñ ù » Ù Ý è Ù 3 Ý Ù á 1 » É Ç . μ á Æ á ñ Ñ 3 i 3 è 3 ñ á o Ù Ý » ñ Ý á o Ý » Ý Ù Ç I ñ á i Ý i » è 3 I 3 Ý Ñ Ç Ù ù » ñ , Ç è I
ù Ý Ý 3 ñ I á o ß B á o I 3 Ý » ñ Á μ Ý á o ã 3 . ñ i á o Ù » Ý Ù » Ý 3 B Ý á ñ Ñ 3 Û Ç Ý Ù ñ ó 3 I ó á o ã Û 3 Ù μ . Ý 3 Û Ç Ý
I á b i á o ã Û á o Ý Ý » ñ á i : Ø á 1 » É Á μ 3 Ø I 3 ó 3 Í Ç Ý » ñ I 3 Ù 3 ó á o ó á 3 I 3 Ý i Ý 3 Û Ç Ý i Ý i » é á o ã Û á o Ý Ý » ñ Ç ó ,
Ý » ñ I 3 Ù 3 ó á o ó á 3 I 3 Ý ý Ç ñ Ù 3 Ý » ñ Ç ó , I » Ý i ñ á Ý 3 I 3 Ý μ 3 Ý I Ç ó Ç I 1/2 . » Ý 3 ñ i 3 ù Ç Ý Ñ 3 i 3 Í Ç ó :
Ø á 1 » É Á . Ý 3 Ñ 3 i 3 Í . á ñ I 3 I Ç ó Ý » ñ Á ù . i 3 . á ñ I í á o Ù » Ý í » ñ Æ á o I » É á o Ñ 3 Ù 3 ñ Ð Ð
i Ý i » é á o ã Û 3 Ý i 3 ñ ù 3 . Ç Í Á :

Ø á 1 » Æ Ç I 3 é á o ó i 3 Í ù 3 Û Ç Ý . á ñ I 3 I Ç ó Ý » ñ Á . Ý 3 Ñ 3 i 3 í » É » Ý I R F M Ù » Á á 1 á i : ¶ Ý 3 Ñ 3 i 3 Í
. á ñ I 3 I Ç ó Ý » ñ Á 3 ñ i 3 Ñ 3 Ù i á o Ù » Ý Ð Ð i Ý i » é á o ã Û 3 Ý Ñ Ç Ù Ý 3 I 3 Ý I 3 é á o ó i 3 Í ù 3 Û Ç Ý
Ñ 3 i 3 I á o ã Û á o Ý Ý » ñ Á : Ù » ñ I 3 Ù 3 ó á o ó á 3 I 3 Ý i Ý 3 Û Ç Ý i Ý i » é á o ã Û 3 Ý i 3 ñ ù 3 . Í Ç í ñ 3 á ñ á ß Ç á
3 1/2 » ó á o ã Û á o Ý á o Ý Ç è á 3 è Ù 3 Ý é á i á ñ á o Û Á Ý » ñ Ç Ç Ý » ñ ó Ç 3 Û Ç μ 3 ñ Ó ñ 3 è i Ç × 3 Ý Á (h = 0.65) :
¶ Ý » ñ Ç Ù Ç Ç Ç Ý i 3 á o ã o ã Û á o Ý Á i Ý i » é á o ã Û 3 Ý Ý » ñ Ù á o I Ù 3 Ý Ñ 3 i 3 Í á o Ù 1.7 » è 3 Ù è Ù 3 I Ç , Ç è I
Ý » ñ ù Ç Ý i Ý i » é á o ã Û á o Ý á o Ù 2 » è 3 Ù è Ù 3 I : 2 BÈ 3 i 3 Ý ù 3 Û Ç Ý á 3 Ù 3 Ý 3 . ñ » ñ Ç Ù Ç Ç Ç Ý
i 3 á o ã o ã Û á o Ý Á . Ý 3 Ñ 3 i 3 í » É Ç . ñ » Æ Á » 3 » è 3 Ù è Ù 3 I , Ç Ý á Á í i 3 Ù á o Ù Ç 3 Ù Ý Ù 3 è Ç Ý , á ñ
i Ý i » é á o ã Û á o Ý á o Ù . Ý » ñ Ý 3 i » Æ Ç Ñ 3 × 3 È » Ý × ß . ñ i í á o Ù , ù 3 Ý 3 Ý i 3 Ý 3 I 3 Ý
3 BÈ 3 i 3 i 3 ñ Ó » ñ Á , á o è i Ç 3 BÈ 3 i 3 i 3 ñ Ó » ñ Ç Ç ñ 3 I 3 Ý . Ý á o á o Ý 3 I á o ã Û á o Ý Á
i 3 i 3 Ý á o 3 I 3 Ý Ù » Í á o ã Û á o Ý Ç :

3 ñ 3 Ù 3 i 3 ñ I 3 Û Ç Ý ù 3 Ø 3 ù 3 I 3 Ý á o ã Û á o Ý Á Ý » ñ I 3 Ù 3 ó i á o Ù Ç Á » Ù Æ á ñ Ç i Ç á Ç I 3 Ý á Ý á i :
¶ Ý 3 Ñ 3 i 3 Ù 3 Ý 3 ñ 1 Ù á o Ý ù á o Ù è i 3 ó i » É Ç , á ñ I » Ý i ñ á Ý 3 I 3 Ý μ 3 Ý I Á , Ý » ñ I 3 á 3 Ñ Ç Ý
è 3 Ñ Ù 3 Ý » É á i i á I á è 3 1 ñ á o Ù Ý » ñ Ç Ù 3 I 3 ñ 1 3 I , Ñ 3 B i Ç Ç 3 é Ý á o Ù á á Ù Ç 3 Ù Ý . Ý 3 × Ç ó á o ó 3 Ý Ç B Á ,
3 Ù È . i á I á è 3 1 ñ á o Ù Ç Ý 3 È á ñ 1 Á 3 Ù 3 Ý 3 I 3 Ñ 3 i 3 Í Ç 3 ñ Á » ù Ý » ñ Á (0.4 I B é á i) :
I » Ý i ñ á Ý 3 I 3 Ý μ 3 Ý I Ý Ç ñ 3 I 3 Ý 3 ó Ý á o Ù Ç i á I á è 3 1 ñ á o Ù Ç Ñ 3 ñ Á » ó á o Ù , í 3 ñ ù 3 . Ç Í , á ñ μ Ý á ñ á ß
Ç . ñ » Æ Á » μ á Æ á ñ I » Ý i ñ á Ý 3 I 3 Ý μ 3 Ý I » ñ Ç Ý 3 é 3 í » É 3 è 1/2 ñ . 3 ó á Õ ý Ç Ý 3 Ý è 3 I 3 Ý Ñ 3 Ù 3 I 3 ñ .
á o Ý » ó á Õ » ñ I ñ Ý » ñ á o Ù : Ù Ù 3 Ý . á ñ I á o ã o ã Û á o Ý Á Ñ Ý 3 ñ 3 í á ñ á o ã Û á o Ý Ç i 3 È Ç è È á o è 3 ÷ » É
i á I á è 3 1 ñ á o Ù Ý » ñ Ç I i ñ á o I i 3 i 3 Ý á o Ù Ý » ñ Ç 1 » á ù á o Ù Ñ 3 i 3 Ý 3 I 3 Ý 3 Ý I 3 Ù á o Ý á o ã Û 3 Ý
I 3 . á o Ù Ç ó ý Ç Ý 3 Ý è 3 I 3 Ý B á o I 3 Ù á o Ù :

² ŮěàÇěáí, Ůá¹»ĚÇ ùÝÝ³ ñĪáóŮÁ ĀáóŮĚ ĵ ĭ³ ĚÇě, ÑÇŮúáóŮ áóÝ»Ý³ Ěáí ĭ Ýĭ »ě³ Ī³ Ý
 . áñĪ³ Ī³ ĚÝ»ñÇ í³ ñù³ . ÇĪ, Ů»ĪÝ³ μ³ Ý»É ĭ Ýĭ »ěáóĀŮ³ Ý¹ ÇÝ³ ŮÇĪ í³ ñùÁ .. ÝĪ³ ñ³ . ñ»É
¹ñ³ Ů³ í³ ñĪ³ ŮÇÝ ù³ Ō³ ù³ Ī³ ÝáóĀŮ³ Ý ÷ áĚ³ ÝóŮ³ Ý Ů»Ě³ ÝÇ¼ŮÁ: ø³ ÝÇ áñ í»ñĚáí³ Ī³ Ý
³ éáóŮáí Ñ»ĭ³ ùñùñáóĀŮáóÝ ĵ Ý»ñĪ³ Ů³ óÝáóŮ³ ßĚ³ ĭ³ í³ ñŌ»ñÇ Īáβĭ áóĀŮ³ Ý áóÝ»ó³ Ī
³ ½¹»óáóĀŮáóÝÁ¹ñ³ Ů³ í³ ñĪ³ ŮÇÝ ù³ Ō³ ù³ Ī³ ÝáóĀŮ³ Ý ÷ áĚ³ ÝóáóŮ³ ŮÇÝ Ů»Ě³ ÝÇ¼ŮÇ íñ³ ,
³ á³ ßĚ³ ĭ³ ÝúáóŮ ŮÇ»ÝáóŮÝ BáĪÇ¹»áúáóŮ Ůá¹»ĚÇ³ ÝóáóŮ³ ŮÇÝ¹ ÇÝ³ ŮÇĪ³ Ý ùÝÝ³ ñĪ¹»ó
 Īáβĭ .. ×ĪáóÝ³ ßĚ³ ĭ³ í³ ñŌ»ñÇ á³ ñ³ .³ ŮáóŮ:

² ŮěàÇěáí, Ůá¹»ĚÁ ÑÝ³ ñ³ íáñáóĀŮáóÝ ĵ ĭ³ ĚÇě ÁÝ¹Ñ³ Ýáóñ Ñ³ í³ ě³ ñ³ ĪáóáóĀŮ³ Ý Ý»ñùá
 ÝĪ³ ñ³ . ñ»É ĐĐ ĭ Ýĭ »ěáóĀŮ³ Ý¹ ÇÝ³ ŮÇĪ í³ ñùÁ .. Ī³ ñáŮ ĵ Ů. ĭ³ . áñĪ¹»É μ³ ñŌñ³ óÝ»Ěáó
 Ñ³ Ů³ ñ ĪÇñ³ éí áŮ¹ñ³ Ů³ í³ ñĪ³ ŮÇÝ ù³ Ō³ ù³ Ī³ ÝáóĀŮ³ Ý³ ñ¹ŮáóÝ³ í»ĭ áóĀŮáóÝÁ:

Đ³ í »Ĥ³ Í 1: ÀÝ¹É³ ŪÝ³ Í Ūá¹»Ķ³ Ñ³ í³ ë³ ñáôŪÝ»ñ

1. êá³ éŪ³ Ý³ Ñ³ í³ ë³ ñáôŪ.

$$c_t = hc_{t-1} + y_{t+1}^* - hy_t^* - \frac{(1-h)}{s}(rr_t - E_t q_{t+1} - x_{t+1}) + e_t^c = hc_{t-1} + y_{t+1}^* - hy_t^* - \frac{(1-h)}{s}rr_t + \frac{(1-h)}{s}[(1-b_q)q_{t-1} + b_q q_{t+1}] + \frac{(1-h)}{s}x_{t+1} + e_t^c$$

$$\text{áñi} \gg \tilde{0} \quad E_t q_{t+1} = (1-b_q)q_{t-1} + b_q q_{t+1}$$

2. ² áñ³ Ý³ Ū³ ŪÝ³ ááôĪ³ Ý³»ñÇ Ū³ ùñŪ³ Ý³ á³ Ū³ Ý³ (hñ³ Ī³ Ý³ ĐŪ² áñáŪ³ Ý³ Ñ³ í³ ë³ ñáôŪ).

$$y_t = (k_1 + k_2)c_t + d_1 q_t - d_2 y_t + (1-k_1 - k_2 - k_3)y_t^* + k_3 gov_t + e_t^y$$

$$\text{áñi} \gg \tilde{0} \quad d_1 = \left(\frac{k_1 ag}{1-g} - k_2 a + \frac{(1-k_1 - k_2 - k_3)a^*}{1-g} \right) \quad d_2 = \left(\frac{k_1 ag}{1-g} - k_2 a + \frac{(1-k_1 - k_2 - k_3)a^*}{1-g} \right)$$

3. Ū³»ñŪáôĪ³ í³ Í³ áñ³ Ý³ Ū³»ñÇ · Ý³ ×Ç Ñ³ í³ ë³ ñáôŪ.

$$p_t^m = b_m p_{t-1}^m + (1-b_m) \left(b E_t p_{t+1}^m + \frac{(1-w_m)(1-bw_m)}{w_m} y_t^m \right) + e_t^{p^m} = b_m p_{t-1}^m + (1-b_m)$$

$$\left(b E_t p_{t+1}^m + \frac{(1-w_m)(1-bw_m)}{w_m} \left((1-g_y)mc_t - \frac{(1-g_y)}{1-g} q_t + \frac{(1-gg_y)}{1-g} y_t \right) \right) + e_t^{p^m} = b_m p_{t-1}^m + (1-b_m)$$

$$\left(b E_t p_{t+1}^m + \frac{(1-w_m)(1-bw_m)}{w_m} \left[(1-g_y) \left(w_t + \frac{g}{1-g} (q_t - y_t) - a_t \right) - \frac{(1-g_y)}{1-g} q_t + \frac{(1-gg_y)}{1-g} y_t \right] \right) + e_t^{p^m} = b_m p_{t-1}^m +$$

$$(1-b_m) b E_t p_{t+1}^m + (1-b_m) \frac{(1-w_m)(1-bw_m)}{w_m} [(1-g_y)w_t - (1-g_y)q_t + y_t - (1-g_y)a_t] + e_t^{p^m}$$

4. Ū³»ñŪáôĪ³ Ý³ ñi³ ñááôĪ³ Ý³ áñ³ Ý³ Ū³»ñÇ · Ý³ ×Ç Ñ³ í³ ë³ ñáôŪ.

$$p_t^h = b_h p_{t-1}^h + (1-b_h) \left(b E_t p_{t+1}^h + \frac{(1-w_h)(1-bw_h)}{w_h} mc_t \right) + e_t^{p^h} = b_h p_{t-1}^h + (1-b_h)$$

$$\left(b E_t p_{t+1}^h + \frac{(1-w_h)(1-bw_h)}{w_h} \left(w_t + \frac{g}{1-g} q_t - \frac{g}{1-g} y_t - a_t \right) \right) + e_t^{p^h}$$

5. ² ßĒ³ í³ í³ ñó»ñÇ ÇÝýĤ³ óÇ³ Ū³ Ñ³ í³ ë³ ñáôŪ.

$$p_t^w = b_w p_{t-1}^w + (1-b_w) \left[b E_t p_{t+1}^w - \frac{(1-bq_w)(1-q_w)}{q_w(1+e_w j)} \left(w_t - \frac{s}{1-h} (c_t - hc_{t-1}) - j(y_t - a_t) \right) \right] + e_t^{p^w}$$

6. $\tilde{A}\tilde{n}^3 \tilde{I}^3 \tilde{Y} \div \acute{a}\tilde{E}^3 \tilde{n}\tilde{A}\tilde{u}\tilde{C} \tilde{N}^3 \tilde{i}^3 \tilde{e}^3 \tilde{n}\tilde{a}\tilde{o}\tilde{U}$.

$$q_t = b_q q_{t-1} + (1 - b_q) E_t q_{t+1} - rr_t + rr_t^* - x_t + x_{t+1} + e_t^q$$

7. $\tilde{n}^3 \tilde{U}^3 \tilde{i}^3 \tilde{n}\tilde{I}^3 \tilde{U}\tilde{C}\tilde{Y} \tilde{u}^3 \tilde{O}^3 \tilde{u}^3 \tilde{I}^3 \tilde{Y}\acute{a}\tilde{o}\tilde{A}\tilde{U}^3 \tilde{Y}\tilde{I}^3 \tilde{Y}\acute{a}\tilde{Y}$.

$$i_t = b_i i_{t-1} + (1 - b_i)(b_p p_t^h + b_{p^m} p_t^m) + e_t^i$$

$\tilde{U}\tilde{a}\tilde{o}\tilde{U}\tilde{Y}\acute{a}\tilde{o}\tilde{A}\tilde{U}\tilde{Y}\tilde{Y}\tilde{n}$.

8. ${}^2 \tilde{n}\tilde{i} \tilde{n}\tilde{I} \tilde{n}\tilde{C} \tilde{C}\tilde{n}^3 \tilde{I}^3 \tilde{Y} \tilde{D}\tilde{U}^2$.

$$y_t^* = r_{y^*} y_{t-1}^* + e_t^{y^*}$$

9. $\emptyset \tilde{I} \cdot \tilde{Y}\tilde{C} \tilde{u}\tilde{n} \tilde{Y}\tilde{u}\tilde{C}\acute{o} \tilde{B} \tilde{O}\tilde{a}\tilde{o}\tilde{U}$.

$$y_t - y_{t-1} = Ds_t + p_t^* - p_t^m$$

10. ${}^2 \tilde{Y}\tilde{i}^3 \tilde{Y}^3 \tilde{I}^3 \tilde{Y} \div \acute{a}\tilde{E}^3 \tilde{n}\tilde{A}\tilde{u}\tilde{C} \div \acute{a} \div \acute{a}\tilde{E}\acute{a}\tilde{o}\tilde{A}\tilde{U}\tilde{a}\tilde{o}\tilde{Y}$.

$$Ds_t = q_t - q_{t-1} - p_t^* + p_t$$

11. $\acute{e}\tilde{a}^3 \acute{e}\tilde{a}\tilde{O}^3 \tilde{I}^3 \tilde{Y} \cdot \tilde{Y} \tilde{n}\tilde{C} \tilde{C}\tilde{Y}^1 \tilde{u}\tilde{e}\tilde{C} \cdot \tilde{Y}^3 \times$.

$$p_t = (1 - g) p_t^h + g p_t^m$$

12. $\tilde{A}\tilde{n}^3 \tilde{I}^3 \tilde{Y}^3 \tilde{B}\tilde{E}^3 \tilde{i}^3 \tilde{i}^3 \tilde{n}\tilde{O}\tilde{n}$.

$$w_t = w_{t-1} + p_t^w - p_t$$

13. $\tilde{U}\tilde{n}\tilde{u}\tilde{C}\tilde{Y} \tilde{C}\tilde{n}^3 \tilde{I}^3 \tilde{Y}\tilde{i} \acute{a}\tilde{I}\acute{a}\tilde{e}^3 \tilde{n}\tilde{a}\tilde{u}\tilde{p}$.

$$rr_t = i_t - E_t p_{t+1}$$

14. ${}^2 \tilde{n}\tilde{i} \tilde{n}\tilde{I} \tilde{n}\tilde{C} \tilde{C}\tilde{n}^3 \tilde{I}^3 \tilde{Y}\tilde{i} \acute{a}\tilde{I}\acute{a}\tilde{e}^3 \tilde{n}\tilde{a}\tilde{u}\tilde{p}$.

$$rr_t^* = i_t^* - p_{t+1}^*$$

15. ${}^2 \tilde{n}\tilde{i} \tilde{n}\tilde{I} \tilde{n}\tilde{C}^3 \tilde{Y}\tilde{i}^3 \tilde{Y}^3 \tilde{I}^3 \tilde{Y}\tilde{i} \acute{a}\tilde{I}\acute{a}\tilde{e}^3 \tilde{n}\tilde{a}\tilde{u}\tilde{p}$.

$$i_t^* = r_{i^*} i_{t-1}^* + e_t^{i^*}$$

16. ${}^2 \tilde{n}\tilde{i} \tilde{n}\tilde{I} \tilde{n}\tilde{C} \cdot \tilde{Y}^3 \times$.

$$p_t^* = r_{p^*} p_{t-1}^* + e_t^{p^*}$$

17. $\emptyset^3 \tilde{e}\tilde{Y}^3 \tilde{i}\tilde{a}\tilde{n} \tilde{i} \tilde{n}^3 \tilde{Y}\tilde{e}\tilde{y} \tilde{n}\tilde{i} \tilde{Y}\tilde{n}$.

$$x_t = r_x x_{t-1} + e_t^x$$

18. $\tilde{a} \tilde{n}\tilde{i}^3 \tilde{I}^3 \tilde{Y} \cdot \tilde{Y}\acute{a}\tilde{o}\tilde{U}\tilde{Y}\tilde{n}$.

$$gov_t = r_{gov} gov_{t-1} + e_t^{gov}$$

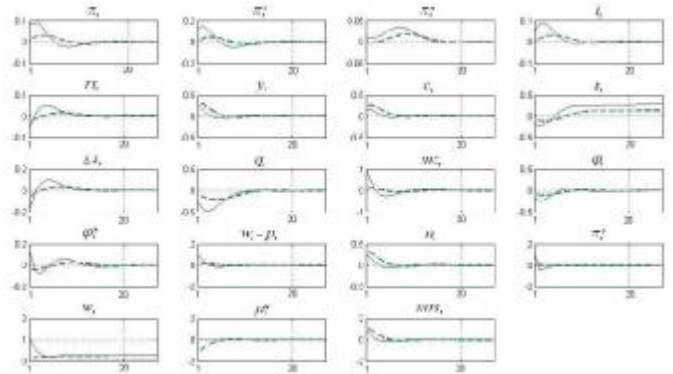
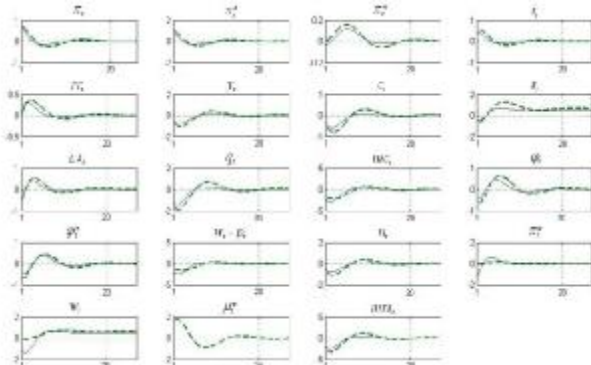
19. $\tilde{U}\tilde{n}\tilde{u}\tilde{C}\tilde{Y}^3 \tilde{n}\tilde{i}^3 \tilde{n}\tilde{a}\tilde{O}^3 \tilde{I}^3 \tilde{Y}\acute{a}\tilde{o}\tilde{A}\tilde{U}\tilde{a}\tilde{o}\tilde{Y}$.

$$a_t = r_a a_{t-1} + e_t^a$$

Đ³ í »É³ Í 3: Øá¹»ÉÇ ÷ á÷ áÉ³ Ĩ³ ÝÝ»ñÇ 1ÇÝ³ ÛÇİ³ ñÓ³ . 3 ÝùÁ³ ĩ³ ñ³ μÝáóŨ³
 BáĬ»ñÇÝ

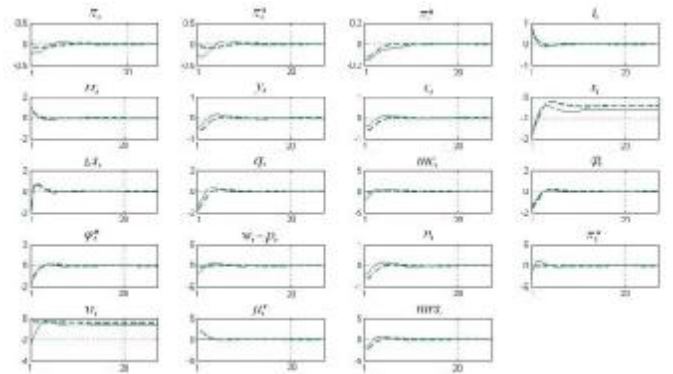
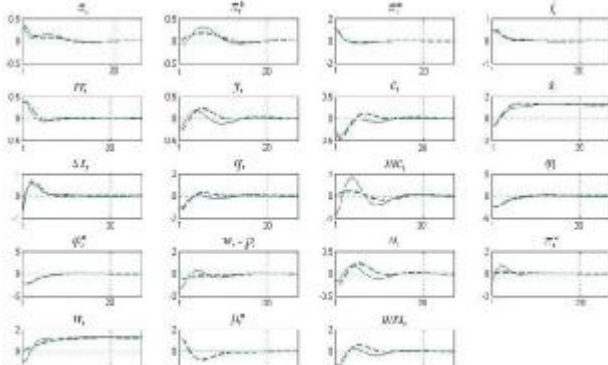
¶ Í³ ÝĬ³ ñ 1: Û»ñùÇÝ³ ñ³ ñ³ áóŨ³ Ý³
 áñ³ ÝùÝ»ñÇ . Ý³ ×Ç BáĬ

¶ Í³ ÝĬ³ ñ 4: 2³ ñ³ »ñĬñÇ Çñ³ Ĩ³ Ý ĐŨ²-Ç BáĬ



¶ Í³ ÝĬ³ ñ 2: Û»ñùáóĬ³ í³ Í³ áñ³ ÝùÝ»ñÇ . Ý³ ×Ç
 BáĬ

¶ Í³ ÝĬ³ ñ 5: í áĬáé³ 1³ áóŨ³Ç BáĬ



¶ Í³ ÝĬ³ ñ 3: 2³ ßÉ³ ĩ³ í³ ñÓ»ñÇ ÇÝÝÉ³ óÇ³ Ũ³
 BáĬ

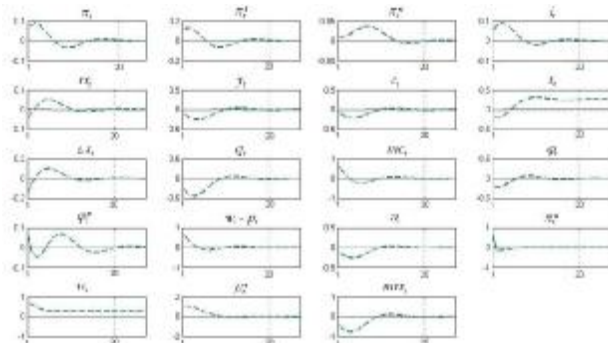


Table 4: Impulse responses (IR) for $(q_w = 0.65)$ and $(q_w \approx 0)$ for the variables $y_t, c_t, i_t, w_t - p_t, rr_t, p_t, p_t^h, p_t^m, mc_t, w_t, s_t, \Delta s_t, q_t, j_t^m, j_t, mrs_t, p_t^w, m_t^w, n_t$. The table shows the response of each variable to a one standard deviation shock in the variables $e_t^{p^h}, e_t^{p^m}, e_t^{y^*}, e_t^i$ under two different values of q_w .

S	$e_t^{p^h} = 1$		$e_t^{p^m} = 1$		$e_t^{y^*} = 1$		$e_t^i = 1$	
	$q_w \approx 0$	$q_w = 0.65$	$q_w \approx 0$	$q_w = 0.65$	$q_w \approx 0$	$q_w = 0.65$	$q_w \approx 0$	$q_w = 0.65$
y_t	0.20	0.31	0.06	0.08	0.05	0.07	0.09	0.14
c_t	0.15	0.24	0.09	0.11	0.04	0.06	0.09	0.13
i_t	0.09	0.13	0.10	0.12	0.02	0.01	0.13	0.15
$w_t - p_t$	0.60	0.47	0.28	0.12	0.17	0.03	0.39	0.05
rr_t	0.07	0.10	0.08	0.08	0.02	0.01	0.17	0.16
p_t	0.13	0.17	0.07	0.07	0.03	0.01	0.06	0.02
p_t^h	0.19	0.25	0.10	0.06	0.04	0.02	0.07	0.03
p_t^m	0.03	0.05	0.22	0.22	0.01	0.01	0.04	0.03
mc_t	0.73	0.66	0.28	0.09	0.17	0.03	0.39	0.06
w_t	<u>0.46</u>	<u>0.21</u>	<u>0.47</u>	<u>0.29</u>	<u>0.14</u>	<u>0.02</u>	<u>0.31</u>	<u>0.04</u>
s_t	0.22	0.35	0.44	0.44	0.13	0.08	0.19	0.27
Δs_t	0.12	0.17	0.17	0.19	0.04	0.02	0.30	0.33
q_t	0.35	0.52	0.22	0.28	0.13	0.07	0.27	0.34
j_t^m	0.17	0.17	0.60	0.57	0.03	0.01	0.30	0.25
j_t	0.15	0.23	0.60	0.60	0.06	0.03	0.28	0.33
mrs_t	0.60	0.91	0.28	0.37	0.17	0.25	0.39	0.51
p_t^w	0.23	0.05	0.22	0.05	0.18	0.02	0.42	0.03
m_t^w	0.00	0.51	0.00	0.32	0.00	0.22	0.00	0.47
n_t	0.20	0.31	0.06	0.08	0.05	0.07	0.09	0.14

