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การปรับตัวและการปรับโครงสร้างของงบดุลในภาคธุรกิจไทย

Corporate Balance Sheet Adjustment and Restructuring in Thailand

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ยรรยง ไทยเจริญ

ประพันธ์ เกียรติโกมล

สายนโยบายการเงิน

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บทสรุป

ข้อคิดเห็นที่ปรากฏในบทความนี้เป็นความเห็นส่วนตัวของผู้เขียนโดยเฉพาะซึ่งไม่จำเป็นต้องสอดคล้องกับนโยบายของธนาคารแห่งประเทศไทย

ความอ่อนแอและความเปราะบางของภาคธุรกิจไทย โดยเฉพาะในส่วนของสัดส่วนหนี้ต่อทุนที่สูง และผลตอบแทนที่ค่อนข้างต่ำ เป็นปัจจัยที่สำคัญปัจจัยหนึ่งต่อสาเหตุการเกิดวิกฤตเศรษฐกิจในปี 2540 และมีส่วนทำให้ผลกระทบของวิกฤตต่อเศรษฐกิจมีความรุนแรงมาก บทความนี้ศึกษาการปรับตัวภายหลังวิกฤตเศรษฐกิจของบริษัทจดทะเบียนในตลาดหลักทรัพย์ และพบว่าจากความพยายามในการปรับโครงสร้างของภาคธุรกิจ รวมทั้งผลจากนโยบายการเงินแบบผ่อนคลายในช่วงที่ผ่านมา ส่งผลให้สถานภาพงบดุลของภาคธุรกิจปรับตัวดีขึ้นอย่างช้าๆจากช่วงวิกฤต อย่างไรก็ตาม แม้ว่าภาคธุรกิจได้ปรับตัวมาถึงระดับหนึ่งแล้ว แต่ในภาพรวมแล้วถือว่ายังคงมีความเปราะบางต่อการเปลี่ยนแปลงจากปัจจัยภายนอก นอกจากนี้ การวิเคราะห์ Panel Data ของบริษัทต่างๆชี้ว่า ฐานะทางการเงินที่อ่อนแอของบริษัทซึ่งสะท้อนได้จากสภาพคล่องที่ต่ำและสัดส่วนหนี้ต่อทุนที่สูงเป็นอุปสรรคสำคัญต่อการลงทุนของภาคธุรกิจไทย ผลดังกล่าวอาจช่วยอธิบายถึงสาเหตุของการฟื้นตัวอย่างช้าๆของปริมาณการลงทุนในช่วงหลังวิกฤตที่ผ่านมา ดังนั้น หากต้องการให้การลงทุนภาคเอกชนมีการฟื้นตัวอย่างชัดเจนขึ้นเพื่อเป็นพื้นฐานของการเติบโตอย่างมั่นคงของภาคธุรกิจไทยในระยะต่อไป จำเป็นต้องมีการเร่งรัดการปรับโครงสร้างหนี้ที่มีคุณภาพ รวมทั้งต้องมีการริบดำเนินการเสริมสร้างความแข็งแกร่งให้กับธุรกิจไทยด้วยการปรับโครงสร้างองค์กรและการปรับโครงสร้างพื้นฐานอย่างจริงจังและต่อเนื่อง

บทสรุปผู้บริหาร
การปรับตัวด้านงบดุลและการปรับโครงสร้างหนี้ภาคธุรกิจของไทย

เหตุการณ์วิกฤตเศรษฐกิจในประเทศไทยและประเทศในภูมิภาคเอเชีย ได้สะท้อนให้เห็นถึงความสำคัญของภาคธุรกิจที่มีต่อภาวะเศรษฐกิจโดยรวมของประเทศ บทความนี้นำเสนอการปรับตัวด้านงบดุลและฐานะทางการเงินของภาคธุรกิจในช่วงหลังวิกฤต ซึ่งภาคธุรกิจไทยต้องเผชิญกับปัญหาต่างๆ มากมายไม่ว่าจะเป็นภาระการชำระหนี้ที่สูง และผลกระทบจากภาวะเศรษฐกิจซบเซา โดยวิเคราะห์ความสัมพันธ์ระหว่างความอ่อนแอของงบดุลของภาคธุรกิจที่มีต่อพฤติกรรมของการลงทุนภาคเอกชน และประเมินบทบาทของนโยบายการเงินในการช่วยการปรับตัวด้านงบดุลของภาคธุรกิจ รวมทั้งนำเสนอแนวนโยบายที่จะช่วยส่งเสริมการประกอบธุรกิจของไทยให้เป็นไปอย่างมีประสิทธิภาพและมีเสถียรภาพที่ดี อันจะนำไปสู่การเจริญเติบโตอย่างยั่งยืนของเศรษฐกิจไทย

ผลกระทบและการปรับตัวของภาคธุรกิจหลังวิกฤต

ในช่วงก่อนวิกฤตเศรษฐกิจ ภาคธุรกิจไทยมีการขยายตัวอย่างมาก เนื่องจากภาวะเศรษฐกิจโดยรวมเอื้ออำนวยทำให้มีการกู้เงินเพื่อมาลงทุนสูงสังเกตได้จากการขยายตัวของสินเชื่อภาคเอกชนซึ่งสูงกว่าร้อยละ 20 โดยเฉลี่ยในช่วง 2536-2539 ผลจากการขยายกิจการอย่างรวดเร็ว ทำให้งบดุลของภาคธุรกิจมีหนี้สินเพิ่มขึ้นมาก พร้อมทั้งมีการกู้เงินตราต่างประเทศเข้ามาเพื่อขยายกิจการเนื่องจากในช่วงนั้นอัตราดอกเบี้ยในต่างประเทศต่ำกว่าในประเทศค่อนข้างมาก อีกทั้งไม่มีความเสี่ยงในเรื่องของอัตราแลกเปลี่ยน ส่งผลให้ภาคธุรกิจไทยมีสัดส่วนหนี้ต่อทุน (Debt/Equity) ค่อนข้างสูงเมื่อเทียบกับประเทศอื่นๆ และมีความเปราะบางเมื่อพิจารณาจากการลดลงของสภาพคล่องทางการเงินต่อการชะลอตัวลงของภาวะเศรษฐกิจในช่วงปี 2539-2540

วิกฤตเศรษฐกิจที่เกิดหลังจากการประกาศลอยตัวค่าเงินบาท เป็นผลจากปัจจัย 2 ประการที่สำคัญ ประการแรกคือ การอ่อนตัวของค่าเงินบาท และอัตราดอกเบี้ยที่สูงในช่วงแรกของวิกฤต และประการที่สองคือ อุปสงค์ในประเทศที่หดตัวอย่างรุนแรง ปัจจัยทั้ง 2 ส่วนนี้ส่งผลกระทบต่อฐานะการเงินของภาคธุรกิจอย่างรุนแรงทั้งในด้านสภาพคล่อง ผลประกอบการ และภาระหนี้ ในด้านสภาพคล่องนั้น พิจารณาจาก Quick Ratio (สัดส่วนทรัพย์สินระยะสั้นหักสินค้าคงคลังต่อหนี้สินระยะสั้น) และ Interest Coverage Ratio (สัดส่วนกำไรก่อนหักรายจ่ายดอกเบี้ยและภาษีต่อรายจ่ายดอกเบี้ย) ของบริษัทจดทะเบียนในตลาดหลักทรัพย์ ที่ปรับลดลงอย่างมากจาก 0.7 และ 2.0

ในปี 2539 เหลือ 0.5 และ 0.3 ในปี 2540 ตามลำดับ ส่วนผลประกอบการซึ่งวัดจาก Return on Average Assets (ROAA: สัดส่วนกำไรสุทธิต่อทรัพย์สินเฉลี่ย) ก็ปรับลดลงอย่างมากเช่นกัน โดยในปี 2540 ROAA ปรับตัวลดลงอยู่ที่ร้อยละ –20 ขณะเดียวกันจากผลประกอบการที่ย่ำแย่และภาระหนี้ที่สูงขึ้น ทำให้สัดส่วนหนี้สินต่อทุนเพิ่มสูงขึ้นจาก 2 ในปี 2539 เป็น 5 ในปี 2540

จากปัญหาข้างต้นทำให้บริษัทหลายๆ แห่งต้องปิดกิจการ ส่วนบริษัทที่ยังดำเนินการอยู่ได้ก็มีการปรับตัวอย่างมาก โดยมีการปรับลดหนี้สิน และเพิ่มทุนพร้อมทั้งมีการปรับโครงสร้างอายุของหนี้สิน จากระยะสั้นมาเป็นระยะยาวมากขึ้น ประกอบกับมีการลดหนี้สินที่เป็นสกุลเงินตราต่างประเทศ ซึ่งช่วยแก้ปัญหาสภาพคล่องและลดความเสี่ยงจากอัตราแลกเปลี่ยน ดังนั้น หลังจากปี 2542 เป็นต้นมา เมื่อภาวะเศรษฐกิจเริ่มปรับตัวดีขึ้น ประกอบกับอัตราดอกเบี้ยที่อยู่ในระดับต่ำตามนโยบายการเงินที่ผ่อนคลายส่งผลให้สภาพคล่องและผลประกอบการของภาคธุรกิจปรับตัวดีขึ้นบ้าง แต่ยังมีความผันผวนและเปราะบาง เนื่องจากภาระดอกเบี้ยจ่ายที่ยังคงสูง ทั้งนี้ในปี 2544 สัดส่วนหนี้สินต่อทุนเฉลี่ยอยู่ที่ 3 ซึ่งยังคงสูงกว่าก่อนวิกฤต

ฐานะทางการเงินของภาคธุรกิจและการลงทุน

การฟื้นตัวของเศรษฐกิจในช่วงที่ผ่านมาเป็นผลจากการดำเนินนโยบายการเงินและการคลังที่มุ่งเน้นการกระตุ้นการใช้จ่ายภายในประเทศ อย่างไรก็ตาม การลงทุนของภาคเอกชนยังฟื้นตัวไม่เต็มที่นัก ปัญหาสัดส่วนของหนี้สินต่อทุนของภาคธุรกิจไทยที่ยังอยู่ในระดับค่อนข้างสูงดังกล่าว ทำให้บริษัทจำนวนมากต้องนำกำไรจากการประกอบการเกือบทั้งหมดไปใช้ชำระหนี้ที่ติดค้างอยู่ ทำให้ไม่สามารถลงทุนในโครงการที่ดีและสร้างกำไรได้ อีกทั้งสถาบันการเงินส่วนใหญ่ก็ลังเลที่จะให้สินเชื่อเพื่อการลงทุนแก่ธุรกิจที่ยังมีภาระหนี้ติดค้างสูง ดังนั้นจึงเป็นที่น่าสังเกตว่า ถึงแม้ ผลิตภัณฑ์มวลรวมในประเทศ ณ ราคาคงที่ ของไทยได้กลับคืนสู่ระดับก่อนเกิดวิกฤตแล้ว แต่ระดับของการลงทุนจริงของภาคเอกชนยังอยู่ที่ประมาณครึ่งหนึ่งเมื่อเทียบกับก่อนเกิดวิกฤต

ปรากฏการณ์เหล่านี้สะท้อนถึงปัญหา Asymmetric Information ที่มีอยู่เสมอในตลาดทุนทั่วไป กล่าวคือ เมื่อผู้ให้กู้มีข้อมูลเกี่ยวกับสถานะที่แท้จริงของผู้กู้และของโครงการน้อยกว่าของผู้กู้เอง และไม่สามารถจะแยกแยะได้แน่ชัดว่าเป็นบริษัทและโครงการที่ดีจริงหรือไม่ ผู้ให้กู้จึงอาจจะเพิ่มดอกเบี้ยสำหรับเงินกู้และขอหลักทรัพย์ค้ำประกันเพื่อชดเชยความเสี่ยง หรืออาจจะปฏิเสธที่จะให้สินเชื่อเลย ปัญหาเหล่านี้จะทวีความรุนแรงขึ้นมากในช่วงที่มีความไม่แน่นอนทางเศรษฐกิจ การตกต่ำในราคาของหลักทรัพย์ที่สามารถนำมาใช้ค้ำประกันได้ หรือช่วงที่ฐานะทางการเงินของ

ทั้งสถาบันการเงินในฐานะผู้ให้กู้ และของบริษัทธุรกิจในฐานะผู้กู้มีความอ่อนแอ ซึ่งปัจจัยเหล่านี้สะท้อนถึงภาวะเศรษฐกิจของไทยในช่วงที่ผ่านมา บทความนี้ได้วิเคราะห์ถึงผลกระทบของฐานะทางการเงินของบริษัทต่อการลงทุนสินทรัพย์ถาวรสุทธิ (net fixed asset) โดยใช้ข้อมูลของบริษัทจดทะเบียนในตลาดหลักทรัพย์ และพบว่า

1) บริษัทที่มีสัดส่วนหนี้ต่อทุนที่ค่อนข้างสูง หรือมีปริมาณสินทรัพย์ที่มีสภาพคล่อง (liquid assets) อยู่น้อยจะมีการลงทุนในสินทรัพย์ถาวรสุทธิ (net fixed asset) น้อยกว่าบริษัทที่มีสัดส่วนหนี้ต่อทุนต่ำ

2) ผลกระทบของฐานะทางการเงินของบริษัทต่อการลงทุนนี้ เริ่มมีบทบาทสำคัญในช่วงหลังวิกฤตซึ่งน่าจะแสดงถึงการเปลี่ยนแปลงของการวิเคราะห์ให้สินเชื่อของสถาบันการเงิน

3) ผลกระทบของการขาดสภาพคล่องและภาระหนี้ที่สูงต่อการลงทุนมีความแตกต่างขึ้นอยู่กับลักษณะของบริษัท

ผลการวิเคราะห์เบื้องต้นนี้ชี้ให้เห็นถึงความสำคัญของนโยบายการเงินผ่อนคลายที่คงอัตราดอกเบี้ยระดับต่ำในช่วงที่ผ่านมามีส่วนช่วยให้ภาคธุรกิจรักษาสภาพคล่องได้ในระดับหนึ่งจากการลดภาระหนี้ในส่วนของค่าใช้จ่ายดอกเบี้ยลง อย่างไรก็ตาม ในส่วนของสัดส่วนหนี้ต่อทุนซึ่งยังอยู่ในระดับค่อนข้างสูงและเป็นอุปสรรคต่อการลงทุนคงต้องพึ่งพาการแก้ไขปัญหาในด้านการปรับปรุงโครงสร้างหนี้ของภาคธุรกิจอย่างจริงจังและมีคุณภาพ โดยมุ่งเน้นบริษัทที่มีศักยภาพในการแข่งขัน เพื่อช่วยให้สัดส่วนหนี้ต่อทุนลดต่ำลงจนไม่เป็นอุปสรรคต่อการดำเนินธุรกิจและการลงทุนในเครื่องมือเครื่องจักร และเทคโนโลยีต่างๆ ที่จำเป็นต่อการเพิ่มศักยภาพของการผลิตและขีดความสามารถในการแข่งขันของภาคธุรกิจไทย

ข้อเสนอแนะสำหรับแนวนโยบาย

สำหรับการพัฒนาเศรษฐกิจในระยะข้างหน้า มีความจำเป็นอย่างยิ่งที่ภาคธุรกิจไทยจะต้องมีความเข้มแข็งและมั่นคงขึ้น สามารถยืนหยัดอยู่ได้ภายใต้ภาวะการแข่งขันในตลาดโลก เพื่อให้เศรษฐกิจไทยในอนาคตเติบโตอย่างต่อเนื่องและยั่งยืน ดังนั้น จึงเป็นเรื่องสำคัญที่ทางภาคธุรกิจไทยจะต้องมีการปรับตัว พร้อมทั้งได้รับการสนับสนุนทางด้านแนวนโยบายจากภาครัฐในหลาย ๆ เรื่องที่สำคัญ คือ

1. สนับสนุนและเร่งรัดการปรับโครงสร้างหนี้ ให้มีประสิทธิภาพและเน้นเรื่องของคุณภาพควบคู่กับปริมาณของการปรับโครงสร้างหนี้ เพื่อให้ธุรกิจที่ยังมีศักยภาพสามารถดำเนินธุรกิจได้

ตามปกติ ซึ่งจะเอื้อให้ธุรกิจสามารถวางแผนการผลิตและการลงทุนได้ในระยะต่อไป รวมทั้งจะเป็นการสร้างความเชื่อมั่นให้กับสถาบันการเงินในการปล่อยสินเชื่อให้แก่ธุรกิจเหล่านี้ โดยควรมีการเร่งปรับปรุงกฎหมายและข้อจำกัดต่างๆ เพื่อให้การปรับโครงสร้างหนี้ทั้งในส่วนของหนี้ด้อยคุณภาพในปัจจุบันและหนี้ด้อยคุณภาพที่อาจจะเกิดขึ้นในอนาคตดำเนินการได้อย่างมีประสิทธิภาพและเป็นธรรมมากขึ้น รวมทั้งมีการเปิดเผยข้อมูลและวิธีการของการปรับโครงสร้างหนี้ เพื่อความโปร่งใสและตรวจสอบได้ ซึ่งมาตรการเหล่านี้จะช่วยทำให้สถาบันการเงินกลับมามีความมั่นใจในการปล่อยสินเชื่อใหม่ให้กับภาคธุรกิจไทยในอนาคต

2. ส่งเสริมบรรษัทภิบาลอย่างจริงจังในส่วนของภาคธุรกิจ โดยยึดหลักการทำงานที่โปร่งใส มีการเปิดเผยข้อมูลทางบัญชีที่ได้ระดับมาตรฐานสากล มีการปกป้องสิทธิของผู้ถือหุ้นรายย่อย มาตรการเหล่านี้จะช่วยสร้างความมั่นใจให้กับนักลงทุนทั้งจากภายในและภายนอกประเทศ ซึ่งจะเป็นช่องทางที่ภาคธุรกิจไทยจะสามารถเพิ่มทุนประกอบการได้ในระยะต่อไป

3. สนับสนุนการพัฒนาตลาดทุนทั้งตลาดหลักทรัพย์และตลาดรูปแบบอื่นๆ (เช่น Venture Capital Fund)ให้มีประสิทธิภาพ เพื่อเป็นทางเลือกที่แท้จริงของภาคธุรกิจทั้งธุรกิจขนาดใหญ่และธุรกิจ SME ในการระดมทุนเพื่อลดการพึ่งพาเงินทุนในรูปของหนี้ซึ่งจะช่วยให้สัดส่วนหนี้ต่อทุนของภาคธุรกิจไทยโดยรวมลดลง นอกจากนั้นจะยังเป็นการกระจายความเสี่ยงของระบบสถาบันการเงินในการจัดสรรทรัพยากรเงินทุนอีกด้วย

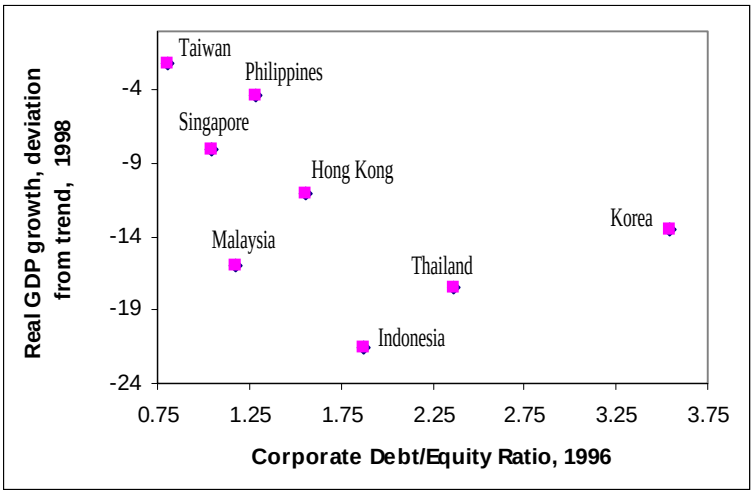
4. สนับสนุนการปรับโครงสร้างกิจการในรูปของการควบรวมกิจการในธุรกิจที่มีความเหมาะสม เพื่อเพิ่มประสิทธิภาพการประกอบการของภาคธุรกิจไทย

การปรับปรุงโครงสร้างของภาคธุรกิจตามแนวนโยบายที่กล่าวมา แม้จะต้องใช้เวลาและเผชิญกับอุปสรรคต่างๆ แต่เป็นสิ่งที่หลีกเลี่ยงไม่ได้ หากเราต้องการให้ภาคธุรกิจเอกชนของไทยฟื้นตัวอย่างแท้จริงและเป็นเครื่องจักรของการเจริญเติบโตทางเศรษฐกิจของไทยอย่างยั่งยืน

1. Introduction

Corporate sector dynamics have moved to the center stage of systemic financial crises in recent years. The most dramatic is the East Asia crisis, which is increasingly attributed to corporate balance sheet problem (Krugman, 1999). Moreover, the role of corporate sector in determining the magnitude of contraction and subsequent output recovery has been highlighted. In particular, there seems to be a link between high degree of leverage among firms prior to the crisis and the subsequent output collapse following the crisis (Stone, 2000). Figure 1 shows the relationship between the average debt/equity ratio for listed companies in each country prior to the crisis and the deviation from trend of GDP growth rate in 1998. It appears that the output contractions were more severe for those countries with high initial levels of corporate leverage.

Figure 1



Source: Strong (2000) and Claessens et al. (1998)

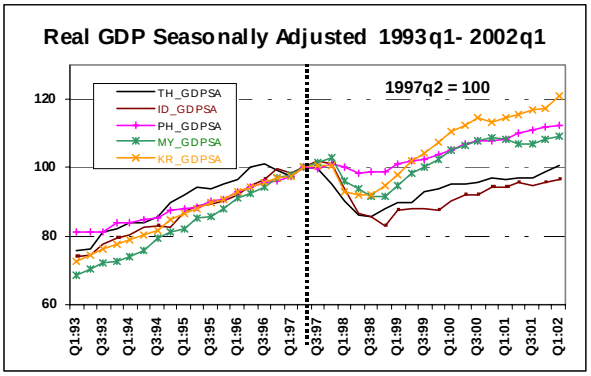
Prior to the crisis, Thai economic growth was driven mainly by private investment, financed mostly by bank lending. Growth accelerated further in the early 90s as a result of large capital inflows. However, relatively high leverage among Thai companies placed Thai corporate sector in a vulnerable position to potential adverse shocks. The financial crisis in 1997, triggered by the floating of the baht and subsequent capital outflows, was followed by a severe contraction in economic activity. The sudden loss of confidence in the economy as shown by the large reversal of capital flow could be attributable in a large part to the adverse shift in expectations regarding the vulnerability of Thai corporate sector. This led to further depreciation of the baht. Thai firms found themselves unable to service their debt with the sharply higher cost of capital and economic contraction. Their dire positions led to rising nonperforming loans in the banking sector, undermining the stability of the financial system. This led banks to curtail their lending, thus exacerbating the downturn.

This new leading role for corporate sector dynamics is posing novel and difficult challenges to policymakers. For example, corporate balance sheets weakened by the crisis limited the ability of central banks to stabilize exchange rates in the East Asia during 1998 (Roubini et al., 1998). Another important policy challenge is large-scale post-crisis

corporate restructuring which seems to be a regular feature of recent systemic crisis (Stone, 2000). Therefore, these evidences suggest that the corporate sector warrants more attention from the policymakers, since a better understanding of corporate sector dynamics could help policymakers prevent the crisis and mitigate its impact on the economy.

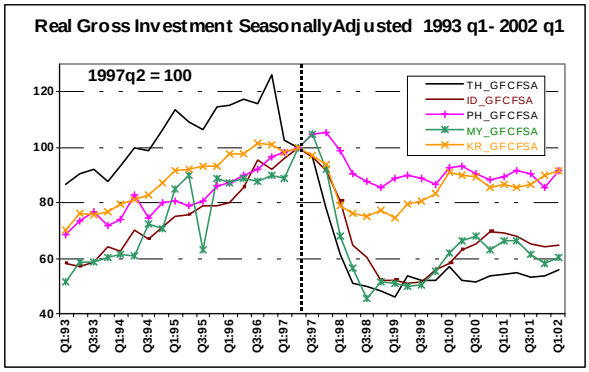
This paper tries to examine the adjustment of Thai corporate sector following the crisis to gauge the problem and progress of firms' balance sheet and operational restructuring. We conclude that though much has been done to strengthen the corporate sector over the past five years, but some weaknesses remain in the corporate sector and thus much remain to be done. On the one hand, aggregate debt-equity ratios have fallen from their excessively high levels; corporate governance has improved; and accommodative macro policy along with the economic recovery has helped to improve cash flows. On the other hand, Thailand's corporate sector remains highly leveraged by the international standards and continued to suffer from low profitability, indicating that much more operational restructuring needs to be done. The paper also highlights the role of an accommodative monetary policy has helped in facilitating the corporate sector's balance sheet restructuring via its beneficial effect on firm's liquidity position.

Figure 1



Source: CEIC

Figure 2



Source: CEIC

Moreover, the paper will try to provide some evidence if there is a link between the health of corporate balance sheets and firm-level investment decision. It is worth noting that while the level of GDP in real term has returned to its pre crisis level (1997:Quarter 2 =100), recovery of the investment level in real term has been slow, being less than 60 percent of the pre-crisis level. A number of possible factors could help explain the slow recovery of investment in post-crisis Thailand. Among them are excess capacity, uncertain outlook, high cost of capital, s more risk averse bankers and weak balance sheet of the corporate sector.

Surely, the true answer probably involves a combination of these factors. However, we will focus here on the last explanation to see if the relatively fragile financial positions of many Thai firms have impeded them from making new investment. Our evidence is consistent with the view that the weak financial health of Thai firms, especially its liquidity and leverage position, have played a role in keeping the recovery in investment relatively mild so far.

The paper is organized as follows. Section 2 presents the adjustment and performance of Thai corporate sectors during and after the crisis. In addition, it provides results of a simple sensitivity analysis to quantify possible impact of monetary policy shock on firm's balance sheet. Section 3 presents results from a panel regression analysis to investigate the influence of firm' financial factors such as liquidity position and leverage ratio on firm's investment. Section 4 concludes the findings in this paper and suggests a number of policy recommendations to address the debt overhang problem as well as enhance the efficiency of Thai corporate sector.

2. Corporate Adjustment and Performance

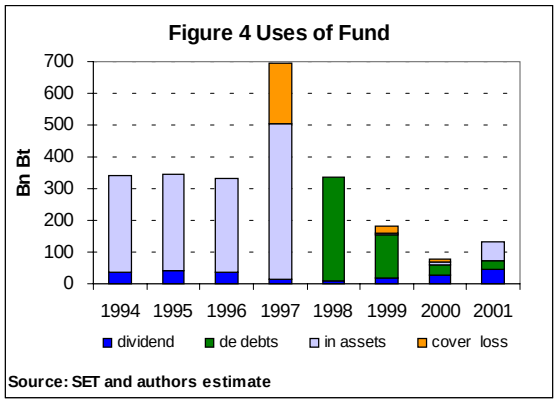
Data Issues

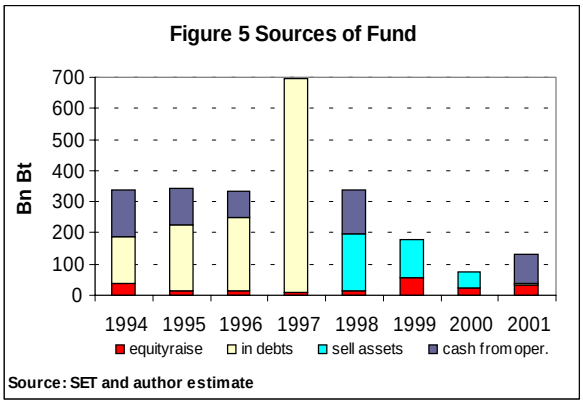
The data we use in the paper to analyze the adjustment of the corporate sector are taken from the Stock Exchange of Thailand (SET)' s ISIMS database. The firm-level database covers from 1994q1 through 2001q4. The number of firms is uneven across the period due to new entrants into or exiting firms from SET. However, in most instances, we will report both the mean and median values of various financial ratios to underscore the difference between the overall change and variation within the sample.

The paper focuses on non-financial public companies listed in the SET which means that financial institutions - including mutual fund (sector 0[1]), banks (sector 2), finance companies (sector 11), and insurance (sector 16)- are not included in the analysis. Furthermore, for easy comparison of balance sheet and income statement we also exclude silos (sector 30) from our sample.

Given all the above criteria, we arrive at 371 firms in our dataset. We have also correct for the issue of different fiscal year cycle, which can be different across firms, so that the years in the paper correspond to the calendar year.

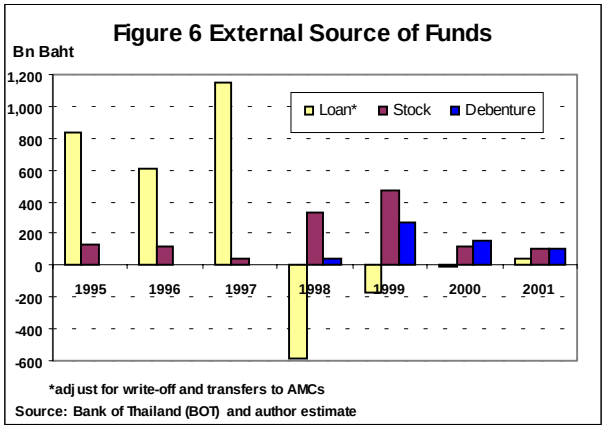
Thai Corporate Uses and Sources of Fund





[1] SET categorizes firms into 33 sectors.

Thai businesses, in the period before the crisis, had main sources of fund from borrowing and cash from operation, and they tended to use available fund on acquiring assets especially fixed assets. In 1997, liabilities and assets rose considerably due to the baht depreciation and the subsequent revaluation of assets, and part of available fund was used to cover losses. From 1998 onward, businesses used fund, mainly coming from sale of assets and cash from operation, to repay debts, thus winding down their liabilities.



Before the crisis, external sources of fund of the private sector mainly came from commercial bank loans. After the crisis, commercial bank loans played almost no role as firms' external sources of fund. Debenture and stock issuances surged in 1998-99 as a result of investor optimism driven mainly by improvement in current account balance and expectation for expedited bad asset resolution. However, after 1999 the deterioration in the current account, due partly to the global economic slow down, together with the realization of slow progress in debt restructuring had slowed the fund raising of Thai corporate. Therefore, Thai corporate sector has recently been relying more and more on internal generated source of fund.

Corporate 's Balance Sheet Adjustment in Thailand

From 1994 to present, there are two distinct phases of the corporate 's balance sheet evolution, namely pre-crisis 1994-1996 and crisis and recovery 1997-2001. We shall begin by discussing the pre-crisis 1994-1996 and then followed by crisis and recovery 1997-2001.

Pre-crisis 1994-1996

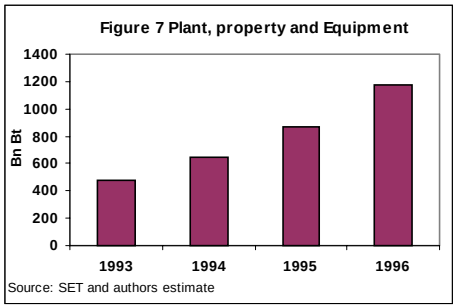


Table 1 Bank Lending Rate

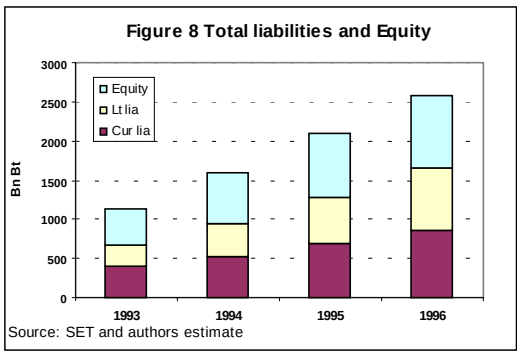
(% per annum)

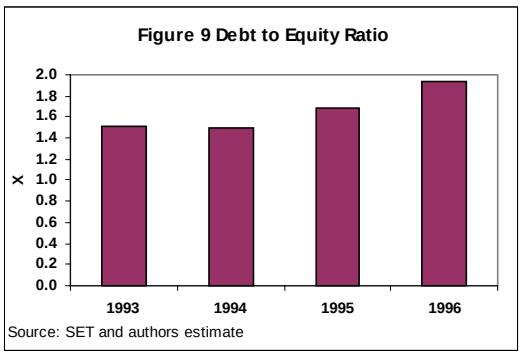
	1993	1994	1995	1996
US	6.0	7.1	8.8	8.3
Japan	4.4	4.1	3.4	2.7
Singapore	5.4	5.9	6.4	6.3
Thailand	11.2	10.9	13.3	13.4

Source: International Financial Statistics, IMF

Thailand' s economy enjoyed a significant growth of around 9.5 percent during 1987-1996 after a recession in 1985. Overall, the economy was strong: high growth with low inflation. On the external side, the current account recorded average deficit of 5.3 percent of GDP while net private capital inflow increased from 0.9 billion US$ in 1987 to its peak of 20.8 billion US$ in 1995. The domestic private credit grew considerably averaged around 24.6 percent over the same period. Thus, this meant that the decade was a golden opportunity for Thai businesses, and was a period of business expansion through commercial bank borrowing. The introduction of Bangkok International Banking Facility (BIBF) in 1993 helped fuel the business expansion through cheap foreign currency denominated debts, reflecting in lower foreign interest rates, given no risk of exchange rate devaluation.

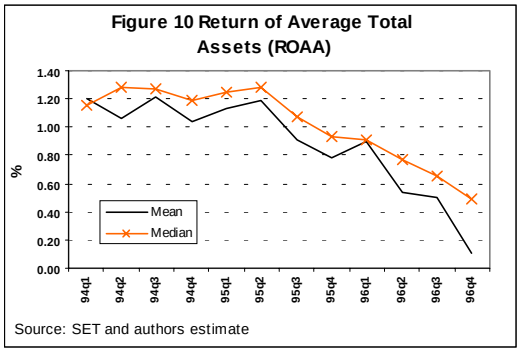
Liability side rose quickly and continuously while equity did not rise as much, leading in an increases in the debt to equity ratio (D/E)[2] during 1994-1996. Moreover, an increasing share of liability was denominated in foreign currencies, and largely unhedged. This led to a rapid rise in total private external debt outstanding, increasing from 49.2 billion US$ in 1994 to 91.9 billion US$. The proportion of current liabilities to total liabilities did not change much during the pre-crisis, standing on average at 55.2 percent. It also worth noting here that heavy reliance on debt of Thai firms, which had one of the highest debt/equity ratios among in the region, put the corporate sector fragile position even before the crisis.

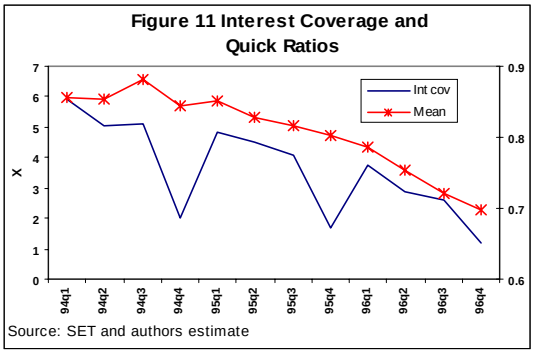




[2] Debt to Equity Ratio (D/E or leverage) = Total Liabilities / Total Shareholders' Equity

Profitability of the corporate sector, measured by return on average total asset (ROAA)[3], was quite low around 3.4 percent during 1994-1995 and showed a falling trend which began in 1995 and then fell rapidly in 1996 due to a decline in sales leading to a fall in net income. On the liquidity side, interest coverage and quick ratios (ICR)[4] also showed a similar trend due to a combination of declining earning before interest and tax (EBIT) and rising interest expenses. Thus, the health of the corporate sector began to deteriorate well before the crisis in 1997.





Crisis and Recovery 1997-2001

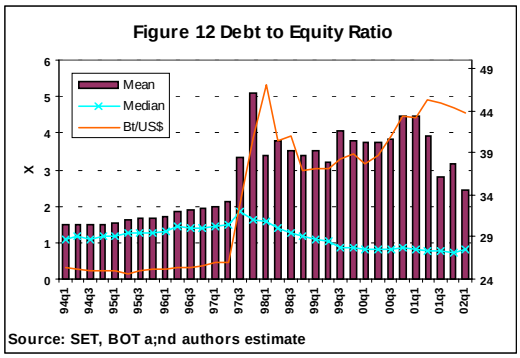
As discussed above, the position of corporate' s balance sheet was rather weak by the end of 1996: rising debts, deteriorating profits and low liquidity. All these provided a unenviable platform for corporate crisis due to the floatation of the baht in 1997.

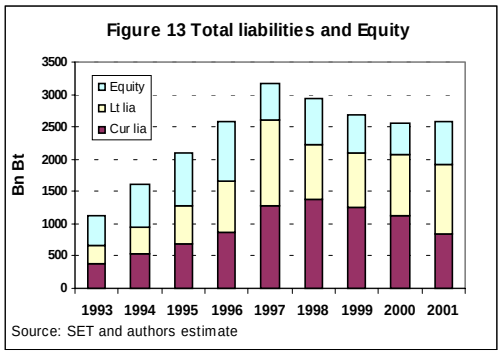
The effect of the crisis in 1997 on the corporate sector was two folds: (1) balance sheet effect and (2) rising interest costs and collapse in domestic demand. The former submerged the corporate sector in a sudden rise of liabilities leading to an abrupt increase in D/E threatening the firms' solvency while the latter weakened firms' profitability and liquidity, threatening the long-term survival ability of firms

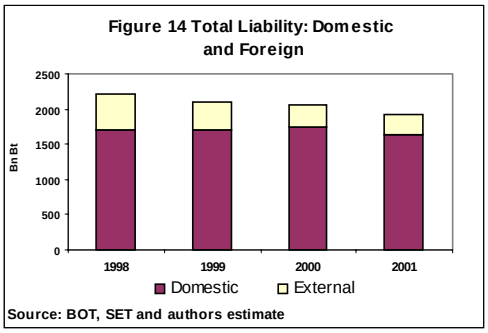
Regarding the balance sheet effect, D/E rose dramatically from the average of around 2 in 1996 to the peak of around 5 in 1997q2 due largely to the floatation of the baht, and total asset rose by 22.8 percent in 1997 owing to revaluation. As a result, equity declined whilst current and long-term liabilities jumped in 1997. From 1998 onward, D/E fell slowly owing to a combination of a slow progress in debt restructuring and a decline in equity. Figure 12 shows that in 1997 equity was reduced by rising debt payments and operating losses. Furthermore, from 1998 onward firms started to reduce their liabilities and change its composition from current to long-term liabilities. The proportion of current

[3] ROAA = (Net Income / Average Total Assets)*100
[4] ICR = EBIT / Interest Expense

liabilities to total liabilities fell from the peak of 62.9 in 1998 to 43.7 in 2001. The reduction had later helped firms' liquidity in the recovery stage.

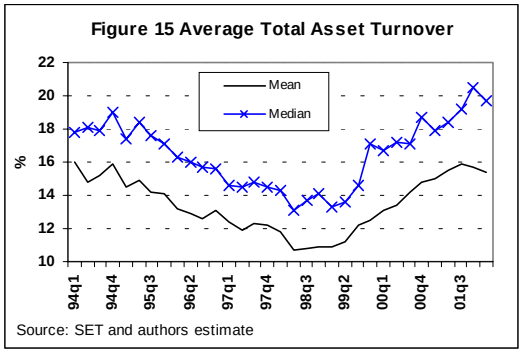


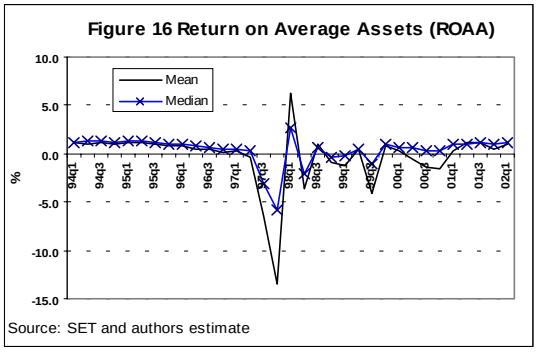




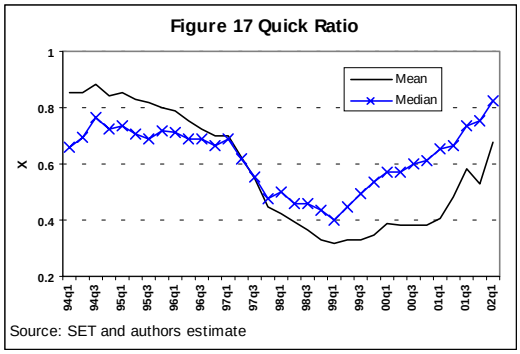
In addition, the proportion of foreign currency debt to total liability fell from about 23 percent at the end of 1998 to 14 percent at the end of 2001 owing to continuing foreign debt repayments. Thus, the vulnerability from exchange rate depreciation had largely been reduced.

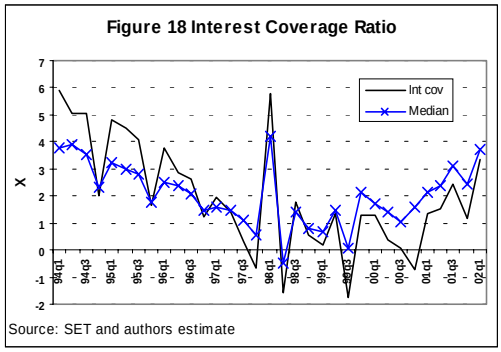
Focusing on the 2nd effect, firms' net profit margin (NPM) deteriorated due mainly to a rise in interest expense and depreciation following increased debts and asset revaluation respectively. A fall in domestic demand had aggravated the firms' profitability even further. NPM declined dramatically in 1997 and thereafter and remained quite low and volatile, though improved marginally as firms tried to keep costs down. As the economy started to recover, given poor NPM, asset turnover improved slowly. Consequently, their profitability, measured by ROAA, finally improved but remained vulnerable to a sudden change in economic condition.





Focusing on liquidity, in 1997-1998, current liabilities of firms rose considerably, probably because creditors had recalled a large chunk of long-term loans, forcing firms to cut their maturity of long-term liabilities to short-term liabilities, reflecting in a big rise in current portion of long-term liabilities. This led to a fall in quick ratio[5] from 0.7 in 1996 to 0.3 in 1998. Additionally, owing to rising costs and falling demand, ICR declined significantly from 3.3 in 1994 to 0.3 in 1997. Later on, as firms wound down their current liabilities, quick ratio improved accordingly, consolidating firms' liquidity. Later on, due to revived domestic demand and strong external demand, ICR had improved, especially from 2000 onward, but remained low and volatile. However, since large burden on interest expense still exists, firms' liquidity is still susceptible to changes in the economic tide.





All in all, the corporate sector's balance sheet has firmed up recently. Any hope of further de-leveraging, outside of progress on debt renegotiation, would depend on the strength of profitability and liquidity, which are still in the early stage of recovery and remain vulnerable to any economic shocks which could easily push ROAA and ICR to the negative territory, further inhibiting any attempt to wind down D/E.

Firm Level Adjustment

As we have seen above, the aggregate ratio masks varied firms' performance in the corporate sector. For example, the median firm's D/E is significantly lower than the average. This means that there are numbers of small firms with low leverage and large firms with high leverage in the sample. Besides, the median firm's leverage is now lower than the pre-crisis level. The existence of firms under rehabilitation may make the aggregate figure very high, explaining part of the large difference between the median firms and the aggregate.

[5] Quick Ratio = (Current Asset – Inventory)/ Current Liabilities

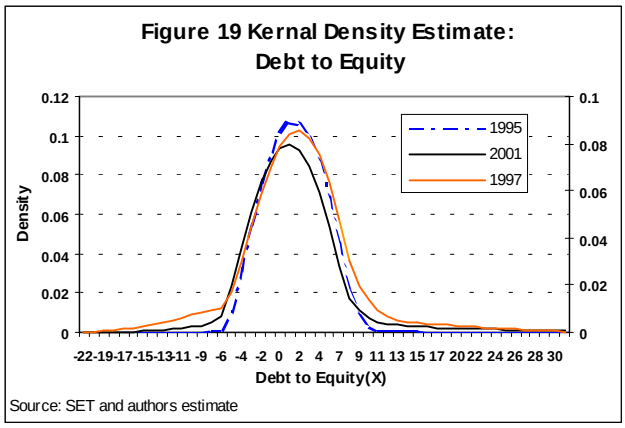


Figure 19 tells us about how the firm level's leverage ratio changed during the stated period. It is clear that in 1997, as the exchange rate depreciated, the distribution shifted to the right because of increased debt value in baht from the foreign currency denominated debts. As firms repaid debt continuously after 1997, in 2001 the situation improved, as reflected by the leftward shift of the curve. However, the tails of the 2001 curve were fatter than those of 1995 suggesting that more firms having negative equity and higher leverage ratio. Furthermore, firms in non-tradable sectors had higher leverage than the firms in tradable sector, and this would have an implication on the varied recovery time of each sector (See figures in the appendix II).

Similarly, during the crisis the profitability, ROAA, of the median firm was higher than the aggregate, suggesting that the effects of the crisis falling on to firms unevenly and particularly hard on the firms with high leverage. The large difference between the median firm and the aggregate in 1997 could partly be accounted for by the performance of firms under rehabilitation. Firms in non-tradable sector were severely affected while firms in tradable sector were not affected as much. As a result, firms in tradable sector recovered more quickly than those in non-tradable sector as mentioned above (See figures in the appendix II).

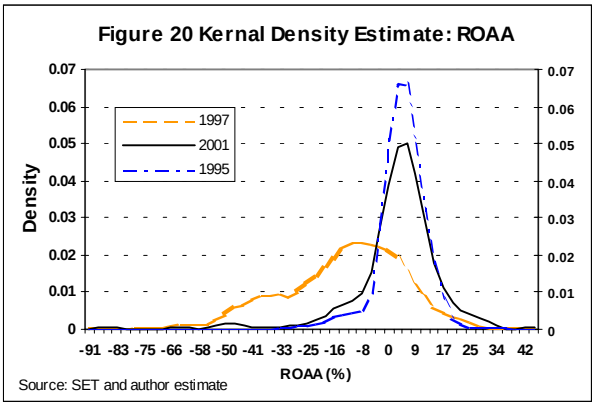
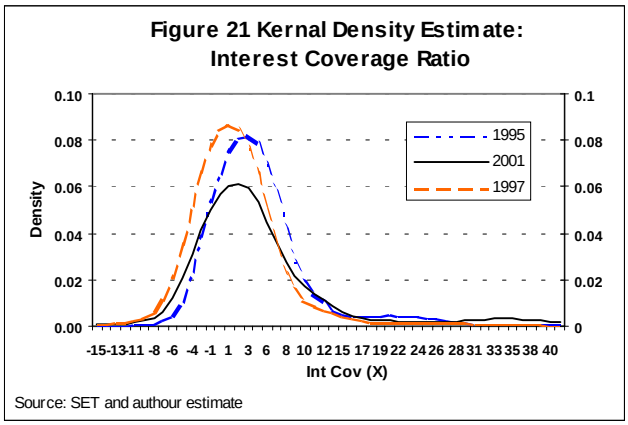
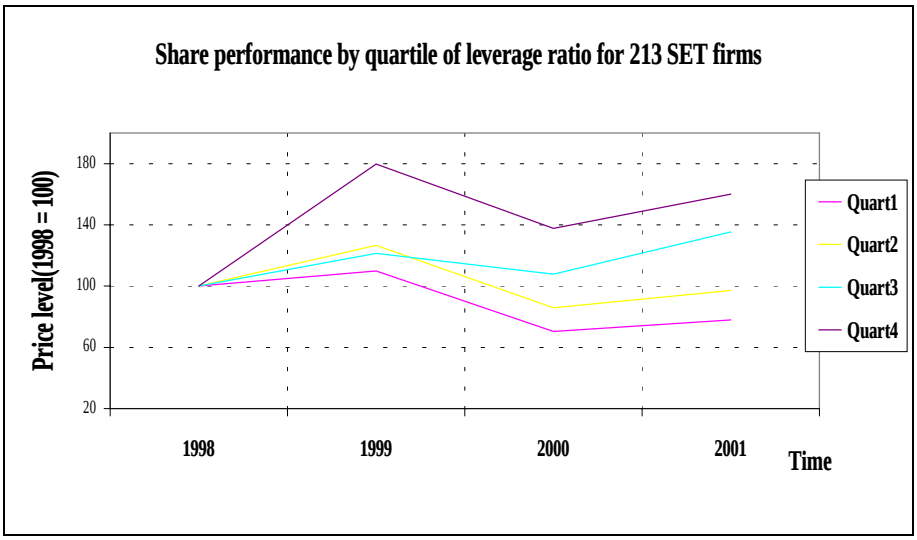


Figure 20 shows the micro story of the firms' profitability. The collapse of domestic demand shifted the distribution of the ROAA to the left. When the macroeconomic environment improved in 2001, the curve shifted to the right with the mode close to the pre-crisis 1995 level. However, the tails of the 2001 curve were fatter than those of 1995, reflecting the recovery came to firms unevenly. The existence of relatively fatter negative tail suggests that there were still many firms making operating losses. The ROAA in 2001 was still quite low at 3.1 percent.



Again, now looking at the liquidity, figure 21 illustrates that the sample firms faced tightened liquidity in 1997. The curve shifted to the left from ICR of 3.2 in 1995 to 0.9 in 1997, reflecting more firms having lower ICR, which means that more firms could not make enough profits to cover interest expenses. As the economy improved the curve shifted back slightly with mode of 2 in 2001, but with lower number of firms. Furthermore, the left tail of the curve was still fatter compared to that of 1995. From this observation, it suggests that although firms' liquidity improved from the crisis, their liquidity has not yet returned to the pre-crisis level. As we have discussed earlier, figure 21 also shows that the crisis affected sample firms' liquidity differently. Firms in tradable sector saw their liquidity improving faster that their counterpart in non-tradable sector.

Box 1 : Share Performance and firm's leverage



There is also evidence that the firms which managed to reduce their leverage ratio have been rewarded by the market. The figure above plots the relative share price performance of firms based on change in their leverage. Firms are ranked in order of decreased leverage between 1998 and 2001.[6] The first quartile are the 25 percent of firms that reduced gearing the most while the fourth quartile are those that reduced it the most.

As the Figure shows, the share prices of firms that recorded the largest reductions in leverage ratio (the first quartile) outperformed all others while those that reduced leverage the least (the fourth quartile) performed the worst. Though we cannot tell for certain which direction causality runs, it is more likely that the failure by some firms in reducing their debt burden or leverage ratio significantly may cause the market to add the risk premium to their share prices for various concerns. Chief among them are possible concerns with low liquidity, financial distress, low investment and thus declining competitiveness, and even bankruptcy risk, which are all associated with firms that have to operate at relatively high leverage for a long period of time. With relatively underperformed share prices, it is very unlikely that firms which failed to reduce their leverage would be able to issue new equity, seek new strategic partners, or get new credit from banks. This will make their financial restructuring or deleveraging a more difficult task.

[6] The change in leverage is measured as the absolute change in the ratio of the book value of liability to the book value of equity.

Despite improvement, signs of vulnerability remain

Despite the recent improvement in the corporate balance sheet, the corporate sector still appears fragile and vulnerable to potential adverse shocks in the future. One measure of corporate financial vulnerability often used in the financial industry is the Altman's Z Score, developed by Edward Altman. The Z Score statistical technique provides a framework for assessing the probability of firms entering into bankruptcy. It calculates five ratios found in a company's financial statements: return on total assets, sales to total assets, equity to debt, working capital to total assets, and retained earnings to total assets. These ratios are then multiplied by predetermined weight factors, based on Altman's original regression analysis of historical bankruptcy cases among U.S. firms, and added together. (Please see Appendix V for more details of the calculations) The Z Score theoretically yields a number between –4 and +8. Firms belong to *the Safe Zone*, or having financially sound position, show Z Score above 2.99, while those scoring below 1.8 belong to *the Distress Zone*, indicating financial distress and facing possible bankruptcy. Scores between 1.8 and 2.99 indicate financial vulnerability.

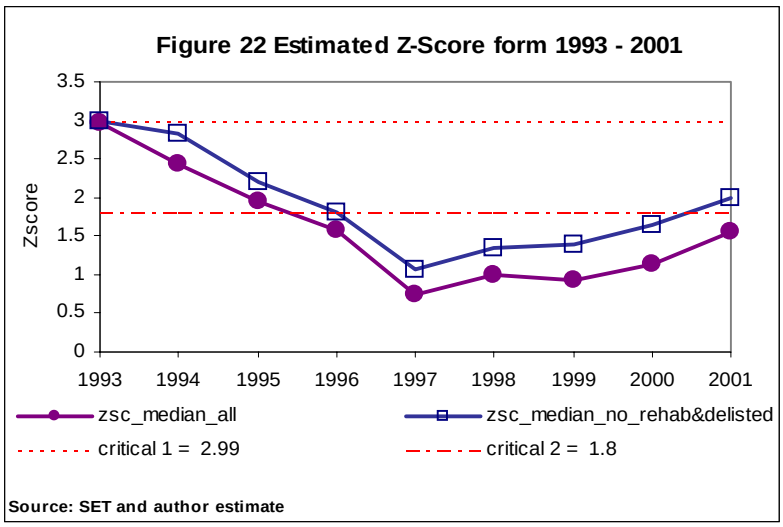


Figure 22 shows the evolution of the Z Score for the median Thai corporate firm over the years. Unsurprisingly, the Z Score for the median firm of the whole sample is lower than that of the sample which excludes delisted firms or firms under rehabilitation. Nevertheless, both series demonstrate the relatively high degree of financial vulnerability among listed firms. Even before the crisis, majority of Thai listed firms were vulnerable to financial distress. In the aftermath of the crisis, Z Score of the median Thai firm consequently dropped significantly and only improved slowly along with the health of the economy in the past couple years. Due to differences in accounting standards and bankruptcy framework across countries, caution should be taken when considering any particular levels of Z, or making any cross country references. Nevertheless, it is telling that according to our calculations, despite recent improvement, the Z Score for the median firm in the SET in 2001 remains close to the 1996 level, indicating that Thai corporate sector, though improving, remains fragile and vulnerable to potential adverse shocks.

Another benchmark which may be useful to gauge the degree of financial vulnerability of Thai firms, especially arising from debt, are the key ratios that Standard and Poor (S&P) calculates and factors in when assigning corporate' s credit worthiness. Table 2 provides some of the median values of key financial ratios, calculated for U.S. firms which received S&P credit ratings for long term debt issuances. Although what are considered to be sustainable ratios differ across countries and industries, the table, nevertheless, illustrates the relatively weaker position of Thai firms.

Table 2: Adjusted Key Industrial Financial Ratios
U.S. Industrial Long Term Debt Ratings (S&P)
(U.S. Values represent three-year (1998 to 2000) medians;
Thai values represent 2001 median)

Ratios	Thai (Median)	AAA	AA	A	BBB	BB	B	CCC
EBIT int. coverage(x)	2.9	21.4	10.1	6.1	3.7	2.1	0.8	0.1
ROC(%)	7.9	34.9	21.7	19.4	13.6	11.6	6.6	1
Op. Inc./ Sales (%)	8.4	27	22.1	18.6	15.4	15.9	11.9	11.9
Debt / Cap.(%)	50.1	22.9	37.7	42.5	48.2	62.6	74.8	87.7

Source: S&P, and author's calculations

The Role of Monetary Policy: Sensitivity Analysis

As we have seen above, the corporate sector's balance sheet has improved since the crisis. The improvement came in a large part from the improved economic environment, debt restructuring and accommodative monetary policy. In this section we will use simple sensitivity analysis to show how monetary policy could affect the corporate sector' s liquidity and profitability. The analysis here shows only 1st round effect (excluding the effects on sales demand) on the liquidity and profitability of the corporate sector.

There are many channels in which monetary policy could affect the corporate sector's bottom line, namely market rate, exchange rate, expectation and asset price. All these channels affect firms directly through interest receipts and payments, costs of imported raw material or indirectly through sales due to changes in demand. Here, we will focus on just the two channels: market rate and exchange rate.

In performing the analysis, we shall assume a simplifying assumption: a change in policy rate transmits fully to bank lending rate and deposit rate, *centeris parisbus.* We also take into account of the structure and composition of both asset and liability which are sensitive to interest change. This led us to estimate many ratios, based on available

information, such as proportion of floating interest rate on domestic loans, proportion of floating interest rate on domestic bonds interest rate on domestic bonds, interest rate on foreign currency denominated debts and percentage of NPLs or distressed assets in the system.

In addition, we also utilize the Bank of Thailand's survey on external debt, which is carried out on a quarter basis. We matched the sample firms to the survey data. In doing so, we get the foreign currency denominated debt of the sample firms. We thus could quantify the effect of changes in exchange rate on foreign currency denominated debts, and hence interest expense associated with the debts.

The analysis is divided into 3 cases 1) 1 percent reduction in policy rate, 2) 5 percent exchange rate depreciation, and 3) 1 percent reduction in policy rate which led to a0.4 percent exchange rate depreciation[7]. Here we will present only case 3) and other cases will be shown in the appendix.

From the table, we see that the effect of 1 percent reduction in the policy rate with an exchange rate depreciation of 0.4 percent on sample firms' interest expense and hence profitability within one quarter after the rate change. Interest expense declines by 8 percent, and net profits increase by 38.3 percent. ROA improves from 0.7 to 1.0. For liquidity, ICR has risen by 7.1 percent.

Although we realize that the assumption of full impact of change in policy rate on market rates here may be rather strong, the result above still highlights how accommodative monetary policy could help the corporate sector by lowering firms' interest expense. It could possibly help provide liquidity of firms at the margin so that these firms will not become new NPLs or, for those restructured firms, NPL-reentries. However, whether firms will be able to compete and survive in the longer term, they would have to rely on operational restructuring, as well as commitment to enhance firms' competitiveness. In the next section, we shall investigate the links between firms' relatively weak financial position and firm investment.

[7] From the Bank of Thailand's Macroeconomic Model, 1 percent reduction of policy rate will induce an exchange rate depreciation of 0.4 percent in 1st quarter, 0.8 percent in 2nd quarter, 1.0 percent in 3rd quarter and 1.2 percent in 4th quarter relative to the initial rate.

Table 3:The 1st round effect of a 1 percent reduction in the Policy Rate with a 0.4 percent exchange rate depreciation on Corporate Sector

(Annualized Data)

	Assumptions			Baseline 2001q4 Million Bt	After rate cut 1.0 Million Bt	%Δ
1 Total liquid assets				**173,193**	**173,193**	
1.1 Cash	Saving rate[1]	=	2.0	111,266	111,266	
1.2 Short-term Investment	6 mths deposit rate[2]	=	2.4	61,927	61,927	
2 Total Debts				**1,742,734**	**1,743,839**	0.1
2.1 Domestic				**1,466,667**	**1,466,667**	
2.1.1 -Bonds				139,533	139,533	
2.1.2 -NPLs	Proportion of distressed loans[3]	=	0.25	331,784	331,784	
2.1.3 -Loans (exc. Bonds, NPLs)				995,351	995,351	
2.2 Foreign Currency Debts[4]				**276,067**	**277,171**	0.4
-Loans & Debt instruments	% **Δ** of Exchange Rate	=	0.4	276,067	277,171	
3 Interest Receipt				**3,712**	**1,980**	-46.7
3/1				2.14	1.14	
4 Interest Expense				**105,217**	**96,783**	-8.0
4/(2.1.1+2.1.3+2.2)				7.46	6.85	
4.1 -Domestic				93,070	84,587	-9.1
4.1/(2.1.1+2.1.3)				8.20	7.45	
4.2 -Loans	Proportion of floating loans[5]	=	0.8	84,000	75,838	-9.7
4.2/2.1.3				8.44	7.62	
4.3 -Bonds	Proportion of floating bonds[6]	=	0.2	9,070	8,749	-3.5
	from TBDC and authors estimate			6.50	6.27	
4.4 -Foreign Currency				12,147	12,196	0.4
	from BOT's survey and authors estimate			4.40	4.40	
5 EBIT				**115,604**	**113,872**	
6 EBT				**10,387**	**17,089**	64.5
7 Net Profits				**17,477**	**24,180**	38.3
8 ROA				**0.69**	**0.96**	38.3
9 Interest Coverage Ratio				**1.10**	**1.18**	7.1
Notes:						
Total Assets				2,521,252	2,521,252	
Δ of int. receipt (assets)					-1732	
Δ of int. expense (liabilities)					8434	
Net Δ of int. expense					6702	
Δ of foreign debts (from ex rate)					-1104	

Sources:

1 and 2 Commercial bank 's rates and authors estimate

3 and 5 SG Security

4 BOT

6 TBDC and authors estimate

3. The Influence of Financial Factors on Corporate Investment

3.1 Motivation

In the past decade there has been a re-emergence of interest in the role that financial factors play in corporate investment decisions. This interest stems from the observation that financial factors such as asset prices, level of firm leverage, and cash flow have had significant roles in explaining recent economic cycles and crises. Recent theoretical developments have also highlighted that cash flows and the structure of a firm's balance sheet may have an important influence on investment, aside from the standard demand-side factors.

The potential link between investment and finance implies that some of the changes in the structure of corporate balance sheets over the decade could provide additional explanation for the dynamics seen during the boom period, the subsequent crisis and recovery in Thailand. During the early 90s, corporate investment took off, mostly financed by bank debt and external borrowing and fueled in part by asset price bubble, which increased the indebtedness of Thai firms significantly. As argued earlier, the high leverage ratio made Thai corporate sectors vulnerable to sudden economic shocks and loss of confidence, whether in the form of an increase in interest rate, exchange rate depreciation and economic slowdown. Following the devaluation of the baht, many Thai firms, facing with a significantly higher debt service and decline in demand, had difficult times in meeting their debt service obligation. This had forced them to cut down on their investment.

Establishing a link between cash flows, leverage and investment also provides insights into the way in which monetary policy affects corporate investment. If cash flows are an important determinant of investment, changes in monetary policy stance, say, by lowering interest rate, will influence investment of indebted firms through a cash flow effect as well as through altering the rate at which the returns to investment are discounted. If this is the case, the higher corporate leverage implies, other thing being equal, that monetary policy may have a larger impact on investment than in the past.[8] Moreover, it implies that changes in monetary policy may not be transmitted evenly across the corporate sector. The cash flows of more highly leveraged firms, or smaller firms will be more sensitive to changes in interest rates than cash flows of firms with lower leverage, or bigger size.

In this section of the paper, we will explore the link between financial factors and investment in a sample of listed non-financial Thai firms. Section 3.2 outlines briefly the theoretical links between finance and investment. In Section 3.3 we present empirical results based on the estimation of a panel-data model. Section 3.4 concludes the findings and argues for an acceleration of the debt restructuring process.

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[8] The ongoing NPL problem in the financial institution system, and reluctance by FIs to lend, has certainly hampered the effectiveness of the monetary transmission mechanism. However, the argument here is that accommodative monetary stance over the past few years have helped ease the debt service burden for the corporate sector and thus, may have provide a lift to private investment, to a certain extent, by improving corporate balance sheet.

3.2 Finance and Investment Theory

Financial factors play a limited role in traditional models of investment. In the neoclassical model, firms choose inputs so as to maximize the present discounted value of their future cash flows. Financial factors enter only through the cost of capital which assumed to be independent of the financing decision. This independence arises because capital markets are assumed to be perfect. Therefore, firms will be able to raise external fund for a project as long as its expected marginal return exceeds its cost of capital. Moreover, the marginal cost of debt, equity and internal funds are equal. In this world, the availability of adequate cash flow is not a constraint on investment and the firm's financial characteristics do not affect its cost of capital. Thus, "interactions between real and financial variables can be reduced to interactions between real variables and interest rates" (Mauskopf, 1990).

There are a number of reasons to believe that this separation of real and financial factors would not take place in the real world. There are both direct and indirect costs in raising external funding, such as underwriting fees, taxation, share dilution, as well as control of information. There is also cost of potential financial distress associated with using external finance. Indeed, as leverage increases, other things being equal, there may be a higher probability of the firm facing financial distress. Financial factors may therefore affect the cost and availability of capital and so influence the investment decision.

However, usually, financial factors are introduced into standard investment models through informational asymmetry or through agency costs. Informational asymmetries, where managers have more information about the true state of the firm or the investment than outsiders, make it difficult for potential debt or equity holders to evaluate the prospects of different firms. If creditors cannot distinguish between good and bad potential borrowers, then the cost of capital will likely include this risk premium. Thus, the good quality borrowers will be charged higher than they would be in the perfect capital market world, whether in the forms of higher borrowing interest rate or discounted price for new equity raised. Moreover, the market may incorporate agency costs – cost borne by owners of the firm resulting from potential conflict of interest between managers, debt holders, and equity holders – into the cost of capital as well.[9] The effect of these information problems results in higher cost of external finance relative to internal finance.

The magnitude of the costs associated with asymmetric information and agency problems could be shown to be a function of the structure of a firm's balance sheet. Accordingly, the structure of a firm's balance sheet will influence its investment decision, and shocks to the balance sheet will thus alter the dynamic behavior of investment pattern. Firms can lower the cost of funding investment in a number of ways. For example, firms may try to increase and rely on cash flows for investment financing in order to avoid more costly external funding. There are also evidences that firms also try to lower the costs of

[9] For example, debt contract provides incentive for managers, acting on behalf of owners, to take on riskier investment projects than would be under different financing structure, since gains will be captured mostly by managers and owners, while loss will shared with debt holders.

obtaining external funding by building up stocks of liquid assets or collateral, as a signal to potential lenders of sound financial position, prior to undertaking large investments. Indeed, Bernanke and Gertler (1989) show that shocks to corporate balance sheet increase the amplitude of the investment cycle in a simple neoclassical model.[10]

Since the degree of asymmetric information and agency costs depends on firm characteristics, certain firms may be more sensitive to financial factors than others. For example, investors are likely to be less-informed about smaller firms. Thus, asymmetric information costs to smaller firms may thus be significant, boosting the costs of external funding. Changes in cash flow position may thus be more important determinants of investment for smaller firms. Similarly, the investment of firms with higher leverage may be more sensitive to change in cash flow than that of less leveraged firms. More debt service burden by highly leveraged firms leave smaller amount of available cash flows to provide a buffer against future disturbances, thus increasing the perceived risk of financial distress.

3.3 An Empirical Model

In this section, we present some empirical results on the influence of financial factors on investment. Fazzari et al. (1988), Devereux and Schiantarelli (1989), and Mills et al. (1994) derive empirically tractable investment equations that include both traditional investment model and the roles of financial factors. To address the standard criticism that liquidity is a proxy for an important omitted variable, namely the profitability of investment, we include Tobin's 'q' value to control for the value of investment opportunities. Agency / financial distress cost are assumed to be a positive function of leverage and a negative function of cash flows, and the stocks of liquid assets for reasons explained earlier. In these models, investment is therefore a positive function of Tobin's q, cash flows and the stock of liquid assets, and a negative function of leverage. Some authors also argue for the inclusion of sales level in the equation to control demand or "accelerator" effects which are not already captured by Tobin's 'q' or cash flow variables. The inclusion of Tobin's 'q' and sales variables are imperfect attempts to control for effects that are difficult to observe. We caution against a structural interpretation of the coefficients and, instead, focus on the estimated coefficients in the effects of liquidity.

The estimating equation is:

$$\frac{I_{it}}{K_{it-1}} = \alpha + \beta_1 q_{it-1} + \beta_2 \frac{C_{it-1}}{K_{it-1}} + \beta_3 \frac{LA_{it-1}}{K_{it-1}} + \beta_4 \frac{D_{it-1}}{K_{it-1}} + \beta_5 \frac{S_{it}}{K_{it-1}} \qquad (1)$$

where: I = investment,
K = capital stock,

[10] They develop a model in which fluctuations in a firm's balance sheet affects the agency costs of external funding and induce fluctuations in investment. Agency costs are assumed to be positively related to collateralisable net worth. This results in a cyclical relationship between quality of balance sheets and investment. During an upturn, for example, net worth increases due to better sales, agency costs are thus reduced and investment picks up, and vice versa.

q = Tobin's 'q',
C = cash flows,
L = stock of liquid financial assets,
D = stock of outstanding debt,
and S = sales

All variables are expressed in nominal terms and are standardized by the capital stock to eliminate the effects of scale. Please see Appendix VI for the choices of proxies employed for each of these variables.

Firm data are from the SET database and are for sample of 187 non-financial firms for which all data required to estimate the equation (1) are available for the seven year period (1995-2001). All firms are not under the rehabilitation plan by the SET as of Q4 2001.[11]

The sales term in equation (1) is comtemporaneous with the investment term. Like investment, it is a flow. It reflects current demand conditions for firm's products. However, due to lack of data on depreciation, we choose to lag the cash flow term one period to avoid potential reverse causality[12] (see for detailed explanation in the appendix). The other terms in equation (1) are lagged one period. These terms are stocks and are measured at the end of the period. Because of this, the lagged value (or the starting period value) reflects more accurately the information set available to firms when the investment decisions are made. It also avoids some of the problems associated with possible simultaneity in investment and capital structure decisions.

Estimation method for the panel regression used here is the fixed effects technique. Generally, either fixed or random effects techniques will be used to handle the systematic tendency of some individual specific components or unobservables to be different in some units from others. The fixed effects estimator is used if the unobservable is assumed to be random or uncorrelated with respect to the explanatory variables. On the other hand, the random effects estimator is used if the unobservable is assumed to be correlated or dependent with respect to the explanatory variables.

To choose between the two techniques, we have performed the Hausman's specification test to the basic estimation. The computed Hausman statistic in our model

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[11] Though details on data construction can be found in the appendix VI, one particular issue is worth underscoring here. The dependent variable we use in this study is the net investment. Ideally, we would like to have the figure for firm's gross investment to eliminate the effect of depreciation. Unfortunately, data on depreciation or gross investment are not kept in the SET database. It would have taken us much bigger resources and efforts to collect these data. After consulting with a number of researchers and analysts in the finance field, we decide to proceed with the study, with awareness of this data limitation.

[12] The appropriate proxy for cash flow measure to be used contemporaneously with the investment term should be the sum of earnings before tax and depreciation. In that case, investment decisions during the year will not affect the amount of cash flow. So simultaneity problem can be avoided. However, since we do not have depreciation data, the adopted proxy for cash flow used here (earnings before tax) would potentially be correlated with investment. An increase in gross investment during the year will likely raise depreciation which should have been added to earnings after tax to arrive at the appropriate measure of cash flow. Therefore, our adopted measure will be biased if used contemporaneously with the dependent variable. As a result, we choose to lag the term one period.

indicated that the null hypothesis of no correlation between the error term and regressors can be rejected. This confirms our priors that there is likely to be correlation between the error term and the regressors in this type of data. Therefore, we choose to employ the fixed effects technique in this panel estimation.

3.4 Results

3.4.1 Aggregated results

We report our basic results in Table 4. In each column, we present the results for the whole period, pre-crisis, crisis, and post crisis period, in order to examine the evolution of importance of each determinant on investment behavior over time. The results provide support for the standard investment models such as Tobin's 'q', and accelerator-type models. The estimated coefficients on both Tobin's 'q' and sales have the expected signs and are statistically significant in all sub-periods.

The results also generally support the hypothesis that financial variables influence investment. The coefficients on the stock of liquid assets have the expected sign and are statistically significant in all sub-periods. However, the coefficients on the lagged cash flow variable are not significant in any sub-period estimation. This could be perhaps attributable to the degree of imperfect proxy for cash flow used here due to the lack of data on capital depreciation. We have also tried to exclude the cash flow variable from all the estimated results shown in this study, the results are not statistically different from what reported here. Indeed, the coefficients on the stock of liquid assets are generally bigger with slightly higher significance level, while the size and significant level for other coefficients are relatively stable.

The debt terms are also correctly signed and significant in both the crisis and post-crisis period. However, it is not significant during the pre-crisis period. These results suggest that capital structure does affect investment behavior especially during the crisis and post crisis periods. Higher levels of debt most likely lead to an increase in a perceived probability of financial distress. As a result, potential creditors may either demand for higher return, or worse, ration or reject the available funding.

Although we caution against attaching too much with any individual estimates, but the fact that the estimate on the debt term is not significant before the crisis period, but becomes significant during and after the crisis period does conform with our priors about how the market's perception with leverage ratio may have changed over time. During the boom period, less attention was paid to the firm's leverage ratio, and external funding for investment were relatively easily obtained. Though we don't have detailed information on bank lending to the SET firms before or after the crisis, but available anecdotal evidences are illuminating.

According to a recent presentation by Banyong Pongpanich, CEO of ML (Thailand), out of 290 listed sample firms in 1995, 109 firms had interest coverage ratio (EBITDA/Interest Expense) less than one, meaning each cannot meet its interest payment obligation with its earning before tax and depreciation expense. However, these firms did

not seem to have problem in securing external lending to fuel their expansions; as a group, they obtained 420 billion baht worth of credit in 1994, 140 billion baht in 1995, and 120 billion baht in 1996. So it seems that firms' financial conditions were not the main constraint of firms' access to external funding prior to the crisis.

However, as a result of the financial crisis and subsequent widespread financial distress and bankruptcy in Thai corporate sector, potential creditors have become more risk-averse and cautious in lending to high leveraged firm. The bigger absolute size of coefficient on debt term during the crisis over the post crisis also suggests that the problem of informational asymmetry may have peaked during the crisis year and subsequently improved over time. Yet, the problem of debt-overhang for Thai corporation remains important today.

We also try to control for the effect of changing economic environments as well as other factors that might affect investment over time. In column 2, we add the average capacity utilization rate during the year as a proxy for economic activities as well as for the degree of excess capacity in the economy over time. The coefficient on the capacity utilization rate has the expected sign and is significant. This lends some support to the assertion that one of the reason for slow recovery in private investment is due to relatively high excess capacity in the economy right now. However, with the capacity utilization rate has been on an upward trend recently, the constraint on investment from excess capacity should become gradually lessen. In any case, the inclusion of the capacity utilization rate does not change the main basic results, with both liquid assets and debt variables remain significant. Moreover, when we have also use yearly dummies as a proxy for changing macro conditions, the results are not statistically different from what reported here.

Table 4: Estimation Results for Balanced Panel Regressions (Fixed Effect)
(Full Sample: 187 firms)

Dependent Variable: Net Investment Rate (t)					
Explanatory Variables	All Period (95-01) (1)	All Period (95-01) (2)	Pre-Crisis (95-96) (3)	Crisis (97-98) (4)	Post-Crisis (99-01) (5)
Tobin's q (t-1)	0.083***	0.07***	0.166***	0.072*	0.108***
	(0.010)	(0.011)	(0.031)	(0.037)	(0.025)
Cash Flow (t-1)	-0.024	-0.03	0.530	-0.105	0.001
	(0.058)	(0.058)	(0.395)	(0.168)	(0.053)
Liquid Assets (t-1)	0.219***	0.201***	0.47**	0.402**	0.364***
	(0.065)	(0.066)	(0.191)	(0.18)	(0.137)
Debt (t-1)	-0.195***	-0.178***	-0.014	-0.363***	-0.121***
	(0.032)	(0.033)	(0.189)	(0.090)	(0.042)
Sales (t)	0.131***	0.134***	0.391***	0.187***	0.104***
	(0.017)	(0.017)	(0.058)	(0.064)	(0.025)
Cap. Util. (t)		0.0014**			
		(0.0006)			

(*,**,*** denotes 10, 5, and 1 percent significant level, respectively)

3.4.2 Disaggregated Results

We are cautious about the ambiguity of the interpretation of the size and significance of estimated coefficients in the estimating equation. One interpretation is that liquidity constraints are important. However, it is also possible that theoretical conditions assumed for this type of estimation are not met, or that Tobin's 'q' is mismeasured. As a result, in the following tables, we will try to separate the sample based on our priors about how liquidity should affect firm investment differently depending on firm's characteristics. This approach is useful even if the estimated coefficients on liquidity are biased. This is because the difference in the estimated coefficients is an unbiased estimate of the true difference as long as the biases are the same for the two sets of firms.

Higher-Leveraged vs. Lower-Leveraged Groups

Corporate leverage among Thai non-financial firms increased considerably in the aftermath of baht devaluation, rising interest rate and recession following the 1997 financial crisis. This caused a sharp decline in interest coverage ratio, putting many firms in situation where they cannot meet debt service obligation by generated profit. The ratio has improved slightly in 2001, but still remains at a relatively low level. This may have made firms' investment even more sensitive to economic conditions and their financial positions.[13] Higher leverage means that a greater portion of firm's cash flows must be used to meet interest payment on debt. Should cash flows from operation fall, firm might not be able to fulfill its debt service obligations, and thus need to curtail investment and other expenditure. Thus, it is possible that Thai firms with higher leverage may face more severe liquidity constraint when making investment decision especially during the periods after the crisis.

To test for this hypothesis, we divided the sample into two subsamples based on firm's median leverage over the 1999-2001 period, and examine the behavior of higher-leveraged firms relative to those with lower leverage. The results are presented in Table 5. Higher leveraged firms might be expected to be more sensitive to leverage and the level of cash flows and the stock of liquid assets. The results in Table 5 tend to support these priors. For firms with higher leverage, both Tobin's 'q' and sales which control for demand condition in the economy have the expected signs and are significant. More importantly, the financial factors, except the cash flow variable, have the expected signs and are significant as well. For firms with lower leverage, level of sales and the stock of liquid assets have the expected sign and are significant. While the coefficients on cash flows, debt and Tobin's 'q' are not significant. It is worth noting that the coefficients on the stock of liquid assets are larger than those firms with lower leverage. Financial factors, therefore, seem to be more important both economically and statistically an influence on investment for firm with higher leverage.[14]

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[13] Bernanke and Gertler (1989) found evidence among US firms that their investment was more volatile with higher leverage.

[14] Sekine(1999) reports the similar findings for Japanese firms during the 1990s. He finds that, for firms with liquidity constraint, higher leverage affected investment. These results highlight the potential impact and importance of the credit channel of monetary policy.

Table 5: Estimation Results (Leverage Groupings)[#] for Post-Crisis Period (1999-2001)

Estimated Equation:

$$\frac{I_{it}}{K_{it-1}} = \alpha + \beta_1 q_{it-1} + \beta_2 \frac{C_{it-1}}{K_{it-1}} + \beta_3 \frac{LA_{it-1}}{K_{it-1}} + \beta_4 \frac{D_{it-1}}{K_{it-1}} + \beta_5 \frac{S_{it}}{K_{it-1}}$$

Dependent Variable: Net Investment Rate (t)
Estimation Period: Post-Crisis (1999-2001)

Explanatory Variables	Higher-Leveraged Firms	Lower-Leveraged Firms
Tobin's q (t-1)	0.197*** (0.04)	0.007 (0.028)
Cash Flow (t-1)	0.008 (0.07)	-0.141 (0.091)
Liquid Assets (t-1)	0.609** (0.267)	0.292** (0.133)
Debt (t-1)	-0.19*** (0.059)	-0.088 (0.077)
Sales (t)	0.093** (0.039)	0.096*** (0.031)
No.of Firms	94	93

(*,**,*** denotes 10, 5, and 1 percent significant level, respectively)

[#] The median debt/equity ratio of firms in the higher-leveraged sub-sample was 2.89 compared with a median ratio of 0.6 for firms in the lower-leveraged sub-sample.

Larger vs. Smaller Firms

To look at the results more closely, we split the original sample of firms into a number of other subsamples. In Table 6, we present the results of the estimation of equation (1) on the equal-sized subsamples of firms. The first sample consists of the larger firms (based on average market capitalization over the post crisis period). The second sample consists of the smaller firms in the sample. Larger firms might be expected to have a greater access to external sources of funds because of the size of their collateralisable assets, stability of cash flows through diversification, established operating history and commercial relationships. Large firms may also benefit from the undercapitalized banking system as banks may choose to continue to lend to them if they are considered "too big too fail". If these priors are true, then large firms will be less reliant on internal funding than smaller firms.

The results presented in Table 6 provide some support for this view. Again, cash flow variables are not significant. On the other hand, the stock of liquid assets are significant for both groups, with slightly higher coefficient for the smaller firms. Though we caution against putting too much emphasis on individual coefficient, this may imply that while liquidity positions matter for both groups, smaller firms may be more reliant on internal liquidity than larger firms. It is then worth noting that the "smaller" firms in our sub-sample are medium-sized, publicly listed companies. They are less likely to be liquidity constrained than the majority of smaller unlisted companies in the economy not included in our sample, and are likely to face lower costs of external funds, lower potential agency costs and also benefit from market recognition. If liquidity positions are important for this group of companies, it is likely that the results also apply to smaller firms that are not in our sample.

Debt is significant for larger firms, but not for the smaller firms. This could be attributable to the fact that large SET firms tend to have much higher leverage which, as shown in the previous table, would have significant impact on investment. So this would imply that the high leverage problem and its impact on investment may be concentrated mainly among larger firms.

Table 6: Estimation Results (Size Groupings)[#] for Post-Crisis Period (1999-2001)

Dependent Variable: Net Investment Rate (t) Estimation Period: Post-Crisis (1999-2001)		
Explanatory Variables	Larger Firms	Smaller Firms
Tobin's q (t-1)	0.094*** (0.031)	-0.006 (0.068)
Cash Flow (t-1)	0.008 (0.092)	-0.051 (0.06)
Liquid Assets (t-1)	0.388* (0.213)	0.414** (0.171)
Debt (t-1)	-0.29*** (0.078)	0.05 (0.073)
Sales (t)	0.138*** (0.041)	0.108*** (0.031)
No.of Firms	94	93

(*,**,*** denotes 10, 5, and 1 percent significant level, respectively)

[#] The average market capitalization of the larger companies in the sample was 26.9 times that of the smaller companies.

Higher Retention vs. Lower Retention Groups

In Table 7, we present the results of the estimation of equation (1) on two equalized subsamples of firms grouped according to retention rates. The first consists of firms with high retention rates – the rate in which firm keep its earning after tax as retained earning instead of paying it out as dividend.[15] The second consisted of the firms that have lower retention rates. Fazzari et al. (1988) argue that the availability of internal finance may constrain investment spending for firms with higher retention rates. One reason for this is that firms may pay low dividends if their demand for investment exceed the amount of internal funds available. Another possible rationale is that a high retention rate is more a signal that, for whatever reason, a firm may face liquidity constraints. Therefore, investment by firms with higher retention rates might be expected to be more sensitive to internal liquidity under this hypothesis. Higher liquidity positions would facilitate increased investment without recourse to more expensive external funds; lower liquidity would constrain investment.

The results in Table 7 are generally supportive to this assertion. For firms with higher retention rates, the stock of liquid assets and the stock of debt are significant, and have the expected signs. Sales and 'q' are also significant. For firms with lower retentions rates, sales and the stock of liquid assets are both significant. Although not too much should be made of the individual coefficients, it is worth noting that the coefficient on the liquid assets for firms with higher retention rates is much larger than the coefficient on liquid assets for firms with lower retention rates.

[15] We use the median of firm's dividend yield over the period as a proxy for firm's retention rate. Firms with lower dividend yield will be categorized as high retention firms, and vice versa.

Table 7: Estimation Results (Retention Groupings) [#] for Post-Crisis Period (1999-2001)

Dependent Variable: Net Investment Rate (t) Estimation Period: Post-Crisis (1999-2001)		
Explanatory Variables	Higher Retention Firms	Lower Retention Firms
Tobin's q (t-1)	0.165*** (0.033)	-0.036 (0.04)
Cash Flow (t-1)	-0.047 (0.067)	-0.127 (0.117)
Liquid Assets (t-1)	0.439* (0.254)	0.351** (0.144)
Debt (t-1)	-0.162*** (0.055)	-0.101 (0.095)
Sales (t)	0.114*** (0.038)	0.086*** (0.032)
No.of Firms	94	93

(*,**,*** denotes 10, 5, and 1 percent significant level, respectively)

[#] The median dividend yield of firms in the higher retention sub-sample was 0 percent (no dividend payout) compared with a median ratio of 5.83 percent for companies in the lower retention sub-sample.

Implications from the Regression Findings

The results from above regression analyses indicate that the structure of a firm's balance sheet and the availability of adequate internal sources of funds can influence investment. Higher leverage can discourage investment by, for example, raising the cost of obtaining further external finance. Excessive level of leverage could even cause banks not to extend any credit at all. Higher cash flows and liquidity will boost investment by providing more, relatively cheap, internal funds and increasing the collateral backing of the firm. The extent to which these factors influence investment does, however, appear to vary between firms. The results suggest that liquidity positions are more important for smaller firms, highly leveraged firms, and firms with high retention rates. While leverage position seems to matter more for larger firms and firms with high retention rates.

The evidence of the influence of financial factors on firm investment found here raise a number of interesting points, with regards to the extensions of the findings as well as implications on monetary policy.

- *Relevance to firms outside the SET*

With regards to extending the results to the firms outside the SET, there are a number of reasons to believe that the problem of asymmetric information and thus the balance sheet effect on investment should apply similarly, if not more severe, to the SMEs and firms outside the SET as well. SMEs, as a whole, claim a significant portion of the economy, with more than 300,000 SMEs accounting for close to 35 percent of outstanding bank loans.[16] Given their relatively small size, public information on financial conditions of SMEs is not readily available. Moreover, SME entrepreneurs tend to conceal their proprietary information to avoid tax and to protect their business secrets from competitors. To address the informational problem, lending is usually based on collateral or personal guarantees.

As a result of the considerable deterioration of collateral value and net worth of the SMEs following the crisis, their access to external funding thus was badly hampered. The problem associated with asymmetric information, which should be more significant for SMEs, especially during the economic contraction, becomes a deterrent to new bank lending. Therefore, the findings that low liquidity and high debt burden hamper firm investment should likely apply to the majority of the firms outside the SET as well.[17]

- *Implications for monetary policy*

These findings are consistent with the existence of a "credit channel" of monetary transmission mechanism. Traditional economic models emphasize on a "interest rate channel" of monetary policy, where monetary policy affects the real sector only through the level of policy interest rate which influence the cost of capital in the economy. However, the credit channel literature highlights the role of financial positions of both the borrowers and lenders on availability and cost of external fund due to financial market imperfection. Bernanke and Gertler (1995) distinguish a balance sheet credit channel and a bank lending credit channel: the balance sheet credit channel stresses importance of borrowers' balance sheets and the bank lending channel focuses on the supply of loans by depository institutions. For example, tight monetary policy weakens borrowers' financial positions through an increase in interest expenses and a decline in the value of borrowers' collateral (balance sheet credit channel). It also weaken banks' financial positions thorough a decline in deposits and an increase in non-performing loans (bank lending credit channel). The weakened financial positions of both borrowers and banks increase price premium of external finance or intensify credit rationing, and thus deter active investment of borrowers. In the case of Thailand, as well as Japan during the 1990s, even

[16] Chaipravat, Olarn and Pongsak Hoontrakul, (2000)

[17] The same can be said about the SET firms which are under rehabilitation plan; if anything, the constraint on investment should be more severe for those rehab firms which were excluded from the sample used in the regression analysis.

though the Bank of Thailand has relaxed monetary policy, its impact on the economy has been restricted to the extent that the credit channels have been affected by deterioration of both borrowers' and banks' financial positions as aftermath of the financial and currency crisis.[18]

Given the existence of balance sheet effect, monetary policy will therefore influence investment through firm's liquidity as well as through influencing the discount rate applied to investment projects and to overall economic conditions. Moreover, the impact of monetary policy will fall unevenly across the corporate sector. Smaller firms, firm with higher leverage and firms more reliant on internal liquidity as a source of funding are likely to be more sensitive to changes in monetary policy than others. Financial factors appear to be less important for firms with lower leverage

It is not our intention to classify whether the demand or supply factors explains the contraction in investment. The reasonable answer should be a combination of both. The findings here however highlight that high debt burden and low liquidity of firms have hampered the amount of investment at the firm level. It could be due to changes in more prudent behavior by banks which now pay more close attention to the quality of firm's balance sheet compared to before the crisis. If this is true, then it is an encouraging sign that banks has learned their lesson and become more vigilant. The issue is to monitor and make sure banks do not become too risk averse for the economy as a whole. On the other hand, it could be that firms lower their investment demand as they found that lowering debt burden is a more efficient way to use limited amount of cash, instead of investing in a new project. Whatever the reason, the findings here provide evidence that corporate sector's relatively weak financial health have impeded with new investment. And one of the important measures to boost investment is to tackle the debt overhang problem in Thai corporate sector.

IV. Conclusions and Policy Recommendations

There is evidence that though the conditions of Thai corporate sector have improved since the crisis, but there are still signs of vulnerability to potential adverse shocks whether in the form of higher interest rate or economic slowdown. More importantly, the high leverage problem remains an important impediment to efficient operations for a significant number of Thai companies. Excessive leverage depressed liquidity and profitability, mainly through the large interest burden, and lowered market valuation. This problem seems to have played a role in limiting investment growth both at the firm and macro levels. It is worth noting that the average annual growth rate of gross fixed capital formation in Thailand during 1999-2001 is only 1.02%. Slow recovery in investment, if continued, may affect the performance and competitiveness of Thai corporate sector in the medium term.

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[18] In this paper, we focus on the balance sheet channel. To test for the bank lending channel on firm level basis, we would need to identify the main bank(s) for each companies to examine the links between bank's balance sheet health and lending decision to a particular firms. Unfortunately, we do not have the necessary data. However, it is not too unreasonable to think that bank lending channel has played an important role during and after the crisis as well.

Moreover, contrary to popular belief, recessions could freeze the restructuring process. The main underlying causes, as highlighted in this study, are financial constraints, which are related to institutional failure whether in forms of underdevelopment of capital market or low corporate governance. While widespread liquidations and bankruptcies made the headlines, recessions following the crises also squeeze the liquidity and financial resources needed to create new, more advanced production units. As the liquidity and credit squeeze continued, the competitive pressure from new production units slowed down and low productivity incumbents can survive more easily. The scarcity of financial resources during the recovery limits the socially useful transfer of resources from low to high productivity units.

Therefore, to mitigate the low investment and efficiency loss problems associated with these financial constraints, as well as to strengthen and enhance the efficiency of Thai corporate sector in the future, we need to address at least the following issues:

1. Accelerate high quality corporate restructuring

To restore profitability and investor confidence, the corporate sector needs to accelerate deleveraging and undertake deeper operational restructuring. In some respects, despite much progress made, the challenging part of corporate restructuring still lies ahead. The attention should be placed on the quality of the restructures agreements as much as on the quantity. Non-viable firms need to be closed, and viable but distressed companies should be subject to rigorous workouts involving debt write downs as opposed to mere rescheduling, or extending grace period. Indeed, the closure of nonviable companies may be a prerequisite for the growth of other companies and the economy as a whole, as these "nonviable" companies are eroding the profit margins and crowding out credit to viable companies, which could not invest in new technologies.

For a voluntary process of corporate restructuring, like those cases under the CDRAC supervision, to work more smoothly and more successfully, the alternatives to an agreement must be made clear and credible. Therefore, the government should continue its effort in improving the legal framework as well as the efficiency of the judicial system in handling court cases involving debt restructuring. In particular, creditors must be able to enforce their legal claims in a timely manner. This will provide incentives to all the parties involved to negotiate in good faith. The credible legal framework on dealing with current and future nonperforming loans, will not only help speed up the process of reducing the current financial distress problem, but also will help renew creditors' confidence on the protection of their rights and thus provide them incentive to extend new lending to viable companies again.

The close link between financial and corporate restructuring requires that the two be taken simultaneously, and with an understanding of their implications for each other. The remaining problems in the financial sector are now largely a result of weaknesses in the corporate sector, and the slow progress in corporate sector deleveraging and restructuring is partially due to the reluctance of creditor banks to write-off bad assets, or reduce debt payments. Progress must be made on both fronts for the process to go forward. With recent improvement in banks' profitability, as well as earlier transfers of

some portion of NPLs to the TAMC, this should help banks to be less concerned with their own financial health and thus more willing to engage in debt workout agreements in a more rigorous and more efficient manner.

2. Improve corporate governance to international best practice

Corporate governance affects the development and functioning of capital markets and exerts a strong influence on resource allocations. In case of Thailand, the investment and financing decisions of companies has often been considered one of the major vulnerabilities that led to the financial crisis. Thus, as part of the structural reform process, improving the corporate governance framework to enhance the transparency and accountability of the management are the key necessary ingredient to enhance corporate performance. Among measures aimed at improving corporate governance which should receive priorities in implementation are upgrading the quality of the accounting standards and information disclosure, improving the protection of minority shareholder's right, and assuring more independence of board of directors from management. These and other beneficial measures should help boost confidence among both domestic and especially international investors which would help attract more investment flow particularly in the form of foreign direct investment.

One additional benefit of improved reporting of corporate sector data is to make it easier both for the authority and the private sector to identify corporate vulnerability in the future. Incorporating corporate sector performance and financial data into the country's early warning model should help make it more reliable and more timely in preventing the future crisis. It also will enhance the effectiveness of crisis management measures as well as restructuring efforts if the crisis does take place.

3. Speed up capital market development for alternative funding sources

Continued development of capital markets would improve credit allocation, provide wider range of financing options for companies, and allow investors to play a stronger role in corporate decision-making. In particular, greater access to the capital markets by small and medium sized enterprises will lower the barriers to entry, facilitate the development of new entrepreneurship. In addition, development of capital markets, whether in terms of the public stock exchange or privately managed venture capital funds, will be especially important for investment in R&D and other innovative activities which rely more heavily on accessing external fund through capital markets. Moreover, it would reduce dependence of Thai companies on bank debt for external funding. Increase in nonblank source of funds should allow the debt to equity ratio of average Thai firms to decline over time, making Thai corporate sector less vulnerable to potential adverse shocks.

4. Enhancing corporate operational efficiency by improving the competition framework as well as encouraging a more active M&A market.

Strengthening the degree of market competition in the real and financial sectors must be part of the reform process. These should involve elimination of anti-competitive

practices, and more liberal regulation on exit and entry of firms to promote more fair competition and provide incentive for firms to continuously improve their operations.

Developing an active mergers and acquisition market will also facilitate restructuring by avoiding the use of the courts and bank-led workouts, and allowing companies themselves to do the necessary restructuring. This would also help promote further consolidation within industries suffering from excess capacity.

One last word of optimism should be mentioned here. Despite the aforementioned weakness in firms' balance sheet and the associated low investment problem during the past few years, the prospects for investment recovery in the near future are encouraging. With the economic recovery underway, improvement in firms' balance sheet in recent quarters, albeit slowly, and thus improved confidence among business owners, this implies that firms could start to focus less on balance sheet restructuring and more on the positive underlying fundamentals. To the extent that their liquidity and available internal fund have improved, they will be able to invest more, despite difficulties with securing external funding. Also, given recent increases in banks' profitability, even the constraints from the supply side might also be relaxed, as banks will be more likely to lend again. So we could expect a stronger investment growth during this year. However, we cannot rely on the strategy to simply grow out of corporate sectors' problem. The facts remain that for the sufficiently high investment growth to be sustained and for Thai corporate sector to be able to compete and continuously improve their performances in the long run, serious and genuine efforts must be put on accelerating high quality debt and operational restructurings as well as on continuing various institutional and structural reforms.

Appendix I: Sample Split

As we have discussed in the paper, the effect of the crisis fell on firms unevenly and the timing of recover was different across firms depending on their nature of business and position of their balance sheet before the crisis. To see this we need to regroup sectors in SET into more manageable categories.

How we regroup the sectors can be best summarized in the following table

Tradable/Non-Tradable	***Category***	***Sector Code***	***Sector Name***
Tradable	*Agri & Food*	*1*	*Agribusiness*
		12	*Food and Beverage*
	Electric & Electronic	*7*	*Electrical Product and Computer*
		8	*Electronic Components*
	Manufacturing	*4*	*Chemicals and Plastic*
		9	*Energy*
		15	*Household Goods*
		18	*Jewelry and Ornaments*
		19	*Machinery and Equipment*
		20	*Mining*
		22	*Pharmaceutical Product and Cosmetic*
		26	*Pulp and Paper*
		27	*Textiles, Clothing and Footwear*
		29	*Vehicles and Parts*
Non-Tradable	*Construction*	*3*	*Building and Furnishing Materials*
		25	*Property Development*
	Service	*5*	*Commerce*
		6	*Communication*
		10	*Entertainment and Recreation*
		13	*Health Care Services*
		14	*Hotel and Travel Services*
		21	*Packaging*
		23	*Printing and Publishing*
		24	*Professional Services*
		28	*Transportation*

Appendix II: Sample Split by Tradable and Non-Tradable

Aggregate

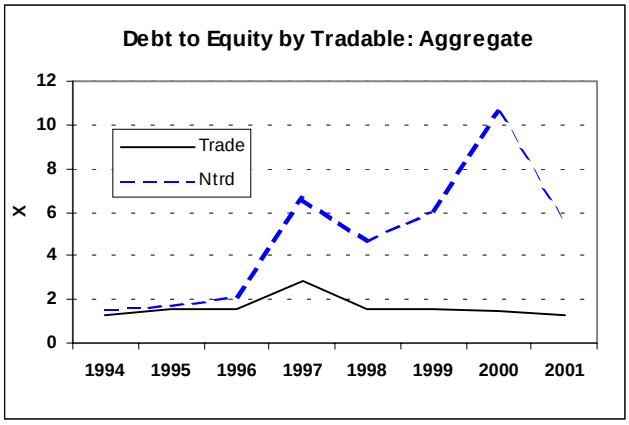


Figure 1

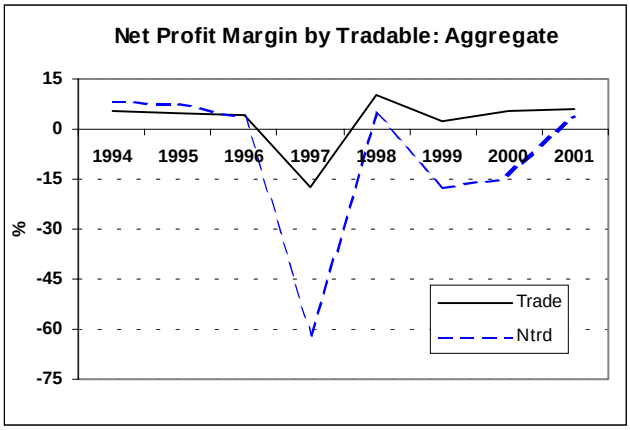


Figure 2

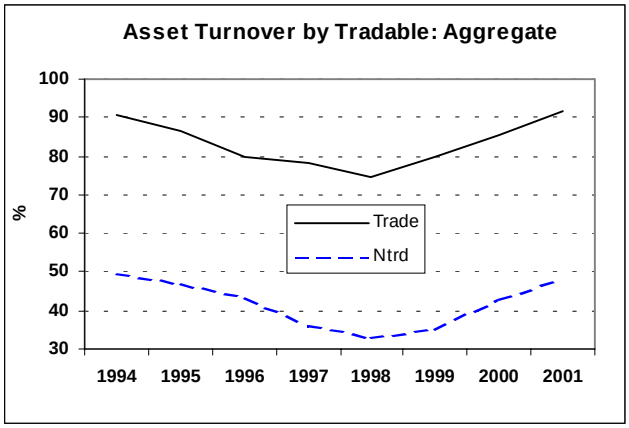


Figure 3

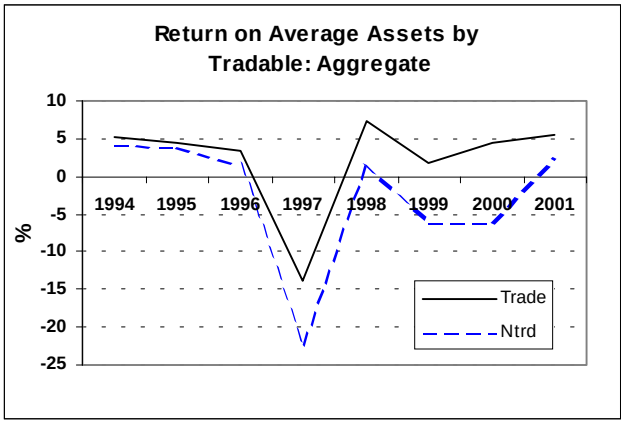


Figure 4

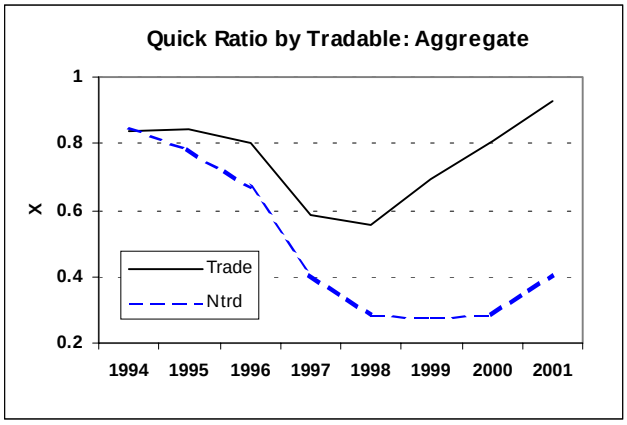


Figure 5

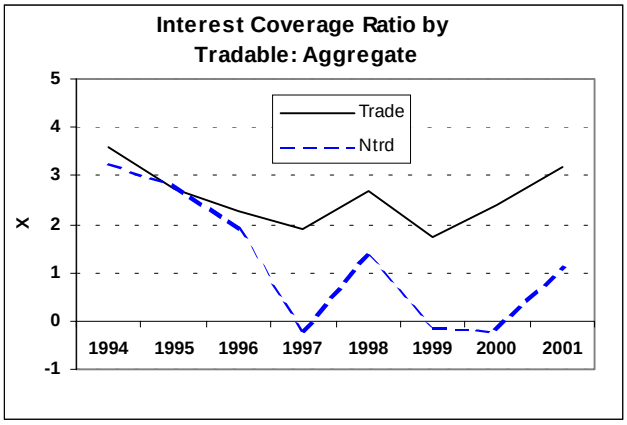


Figure 6

Median

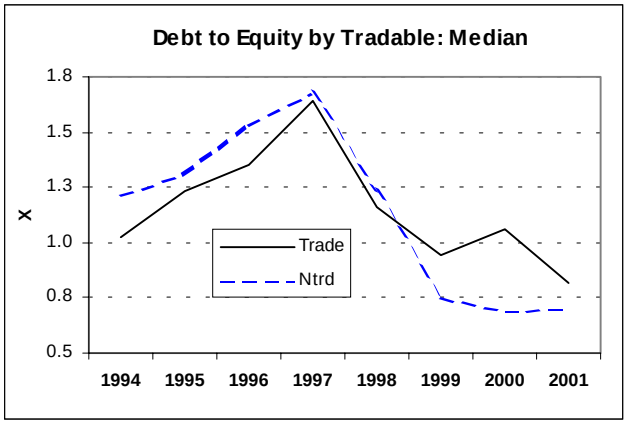


Figure 7

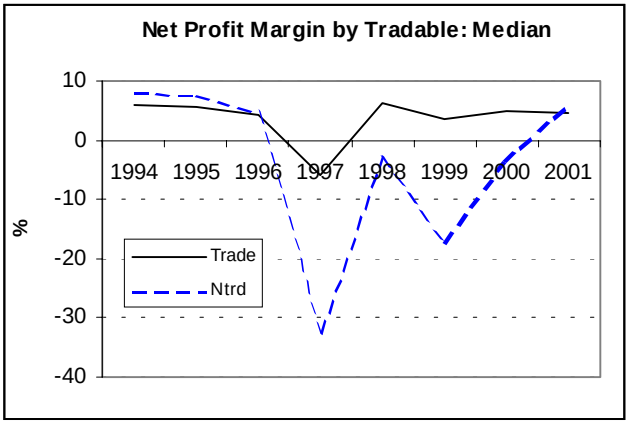
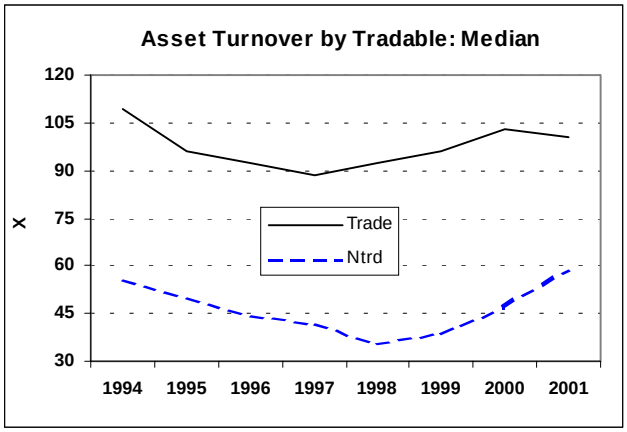


Figure 8



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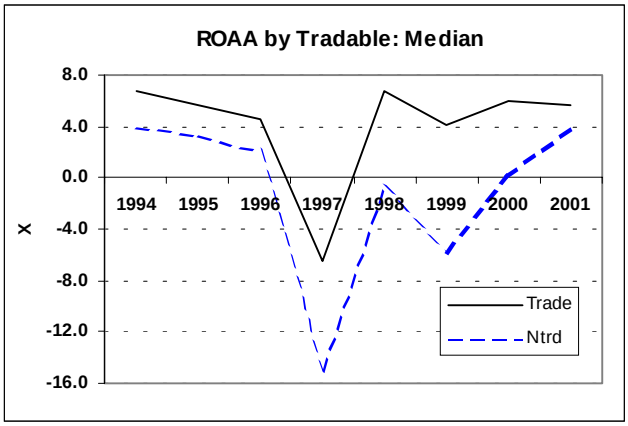

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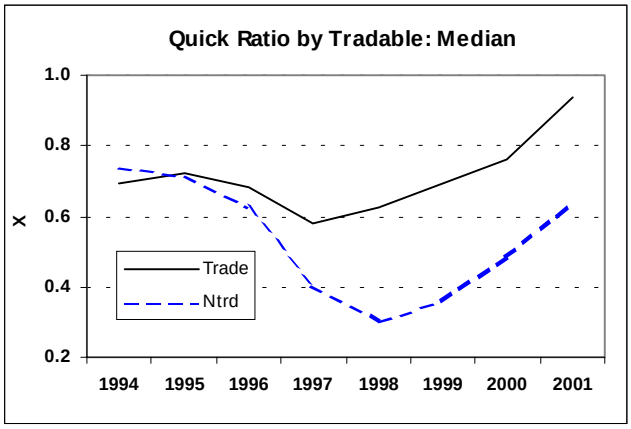

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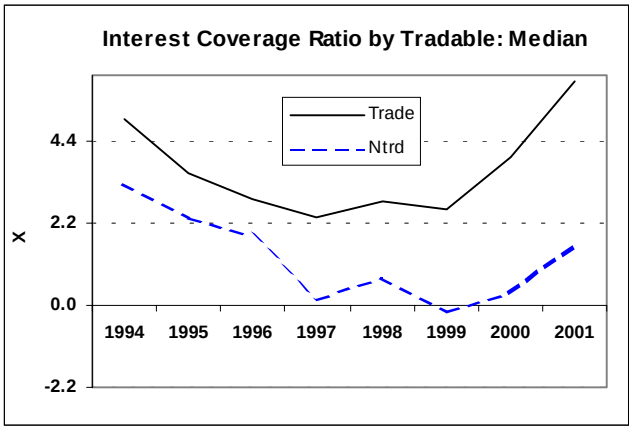


Figure 12

Source: SET and authors estimate

Appendix III: Sample Split by Category

Aggregate

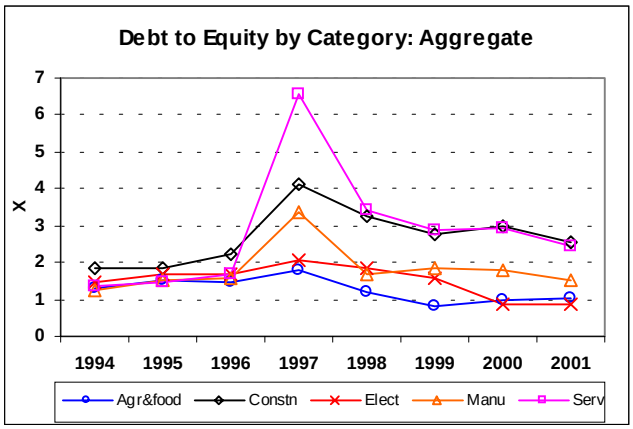


Figure 1

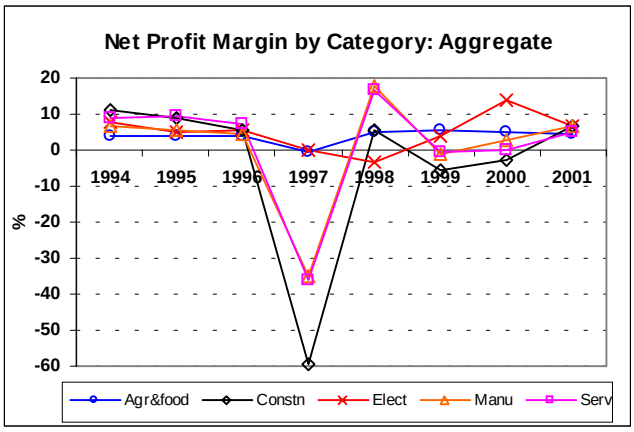
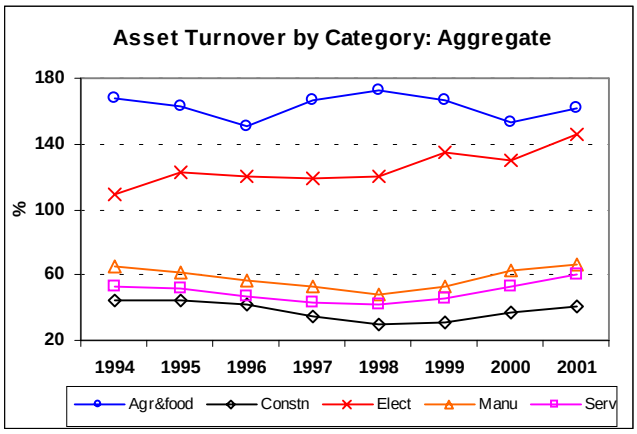


Figure 2



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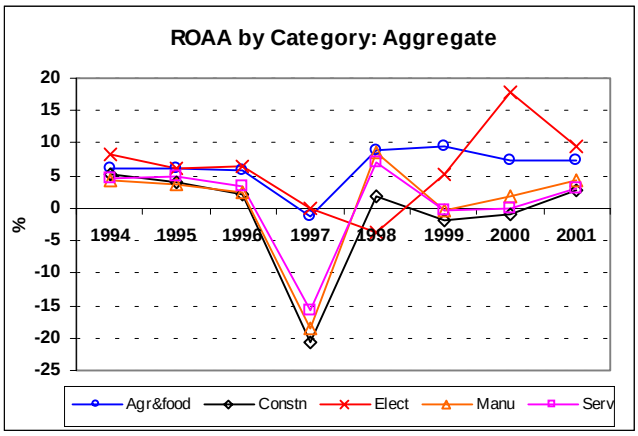
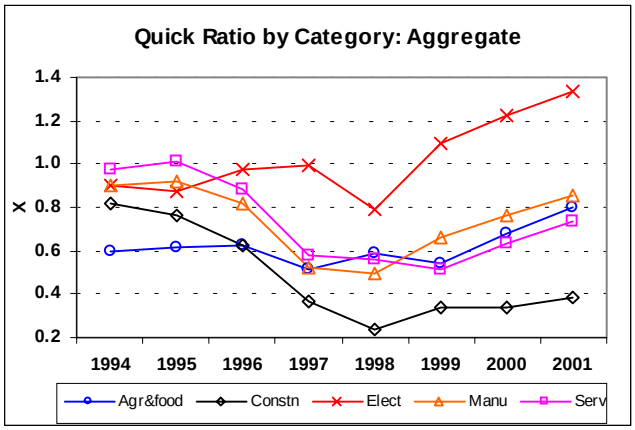


Figure 4



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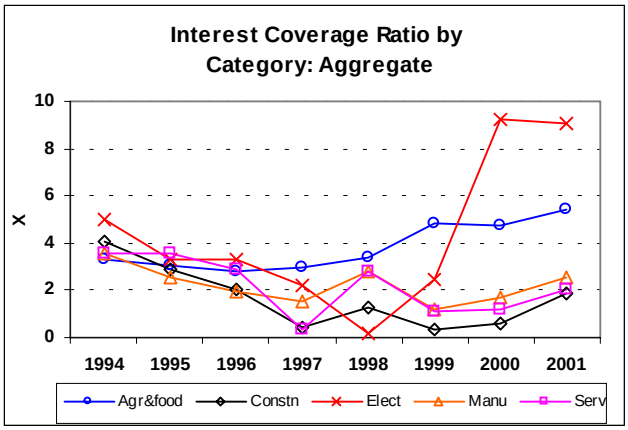

Figure 6

Median

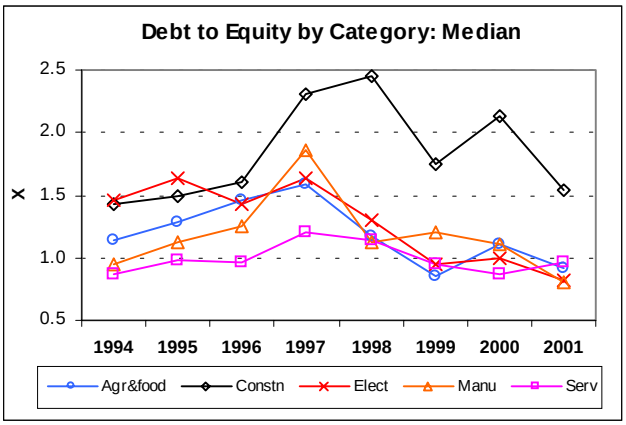

Figure 7

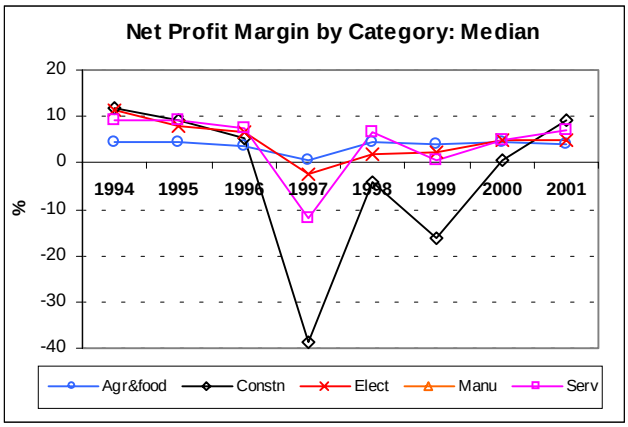

Figure 8

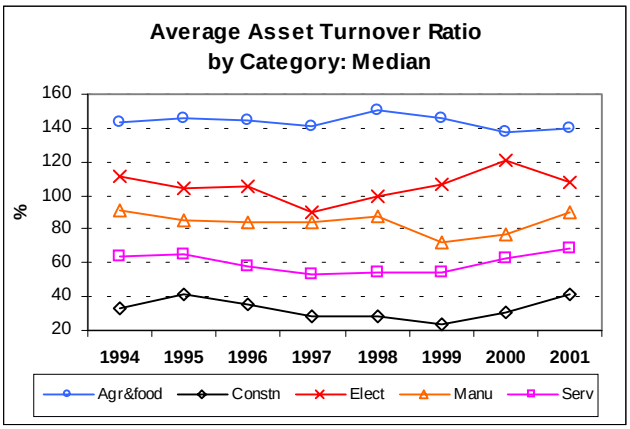

Figure 9

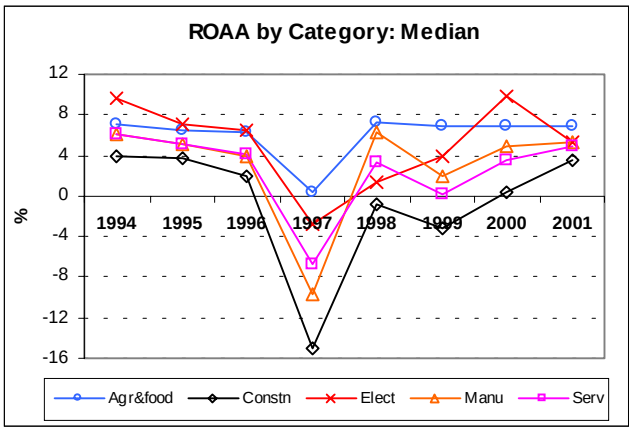

Figure 10

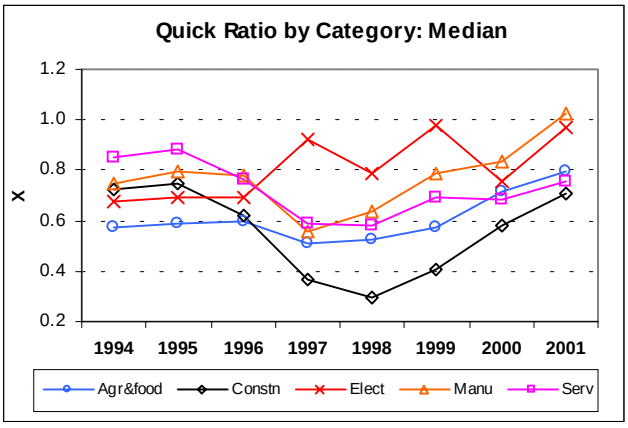

Figure 11

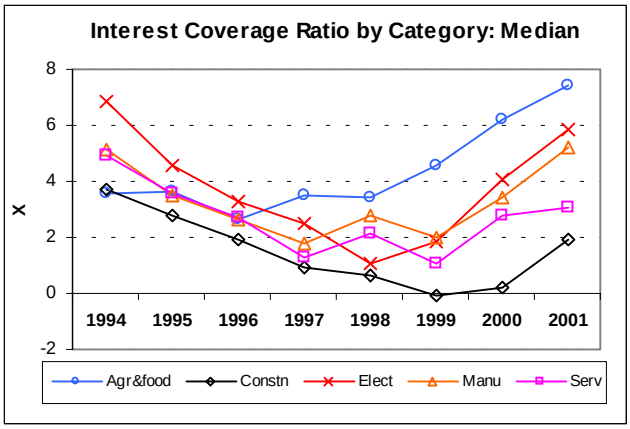

Figure 12

Source: SET and authors estimate

Appendix IV: Sensitivity Analysis: Case I

Table 1 : The 1st round effect of a 1 percent reduction in the Policy Rate on Corporate Sector
(Annualized Data)

	Assumptions			Baseline 2001q4 Million Bt	After rate cut 1.0 Million Bt	%Δ
1 Total liquid assets				**173,193**	**173,193**	
1.1 Cash	Saving rate[1]	=	2.0	111,266	111,266	
1.2 Short-term Investment	6 mths deposit rate[2]	=	2.4	61,927	61,927	
2 Total Debts				**1,742,734**	**1,742,734**	
2.1 Domestic				**1,466,667**	**1,466,667**	0.0
2.1.1 -Bonds				139,533	139,533	
2.1.2 -NPLs	Proportion of distressed loans[3]	=	0.25	331,784	331,784	
2.1.3 -Loans (exc. Bonds, NPLs)				995,351	995,351	
2.2 Foreign Currency Debts				**276,067**	**276,067**	
-Loans & Debt instruments	% **Δ** of Exchange Rate	=	0.0	276,067	276,067	
3 Interest Receipt				**3,712**	**1,980**	-46.7
3/1				2.14	1.14	
4 Interest Expense				**105,217**	**96,734**	-8.1
4/(2.1.1+2.1.3+2.2)				7.46	6.86	
4.1 -Domestic				93,070	84,587	-9.1
4.1/(2.1.1+2.1.3)				8.20	7.45	
4.2 -Loans	Proportion of floating loans[5]	=	0.8	84,000	75,838	-9.7
4.2/2.1.3				8.44	7.62	
4.3 -Bonds	Proportion of floating bonds[6]	=	0.2	9,070	8,749	-3.5
	from TBDC and authors estimate			6.50	6.27	
4.4 -Foreign Currency				12,147	12,147	0.0
	from BOT's survey and authors estimate			4.40	4.40	
5 EBIT				**115,604**	**113,872**	
6 EBT				**10,387**	**17,138**	65.0
7 Net Profits				**17,477**	**24,228**	38.6
8 ROA				**0.69**	**0.96**	38.6
9 Interest Coverage Ratio				**1.10**	**1.18**	7.1
Notes:						
Total Assets				2,521,252	2,521,252	
Δ of int. receipt (assets)					-1732	
Δ of int. expense (liabilities)					8483	
Net Δ of int. expense					6751	
Δ of foreign debts (from ex rate)					0	

Sources:
1 and 2 Commercial bank 's rates and authors estimate
3 and 5 SG Security
4 BOT
6 TBDC and authors estimate

Sensitivity Analysis: Case II

Table 2 : The 1st round effect of a 5 percent exchanger rate depreciation on Corporate Sector
(Annualized Data)

	Assumptions			Baseline 2001q4 Million Bt	After rate cut 0.0 Million Bt	%Δ
1 Total liquid assets				**173,193**	**173,193**	
1.1 Cash	Saving rate[1]	=	2.0	111,266	111,266	
1.2 Short-term Investment	6 mths deposit rate[2]	=	2.4	61,927	61,927	
2 Total Debts				**1,742,734**	**1,756,538**	0.8
2.1 Domestic				**1,466,667**	**1,466,667**	
2.1.1 -Bonds				139,533	139,533	
2.1.2 -NPLs	Proportion of distressed loans[3]	=	0.25	331,784	331,784	
2.1.3 -Loans (exc. Bonds, NPLs)				995,351	995,351	
2.2 Foreign Currency Debts				**276,067**	**289,871**	5.0
-Loans & Debt instruments	% **Δ** of Exchange Rate	=	5.0	276,067	289,871	
3 Interest Receipt				**3,712**	**3,712**	0.0
3/1				2.14	2.14	
4 Interest Expense				**105,217**	**105,824**	0.6
4/(2.1.1+2.1.3+2.2)				7.46	7.43	
4.1 -Domestic				93,070	93,070	0.0
4.1/(2.1.1+2.1.3)				8.20	8.20	
4.2 -Loans	Proportion of floating loans[5]	=	0.8	84,000	84,000	0.0
4.2/2.1.3				8.44	8.44	
4.3 -Bonds	Proportion of floating bonds[6]	=	0.2	9,070	9,070	0.0
	from TBDC and authors estimate			6.50	6.50	
4.4 -Foreign Currency				12,147	12,754	5.0
	from BOT's survey and authors estimate			4.40	4.40	
5 EBIT				**115,604**	**115,604**	
6 EBT				**10,387**	**9,780**	-5.8
7 Net Profits				**17,477**	**16,870**	-3.5
8 ROA				**0.69**	**0.67**	-3.5
9 Interest Coverage Ratio				**1.10**	**1.09**	-0.6
Notes:						
Total Assets				2,521,252	2,521,252	
Δ of int. receipt (assets)					0	
Δ of int. expense (liabilities)					-607	
Net Δ of int. expense					-607	
Δ of foreign debts (from ex rate)					-13803	

Sources:
1 and 2 Commercial bank 's rates and authors estimate
3 and 5 SG Security
4 BOT
6 TBDC and authors estimate

Appendix V: Altman's Z Score- The Methodology

Ratio	Formula	Weight Factor
Return on Total Assets	$\frac{\text{Earning Before Interest and Taxes}}{\text{Total Assets}}$	x 3.3
Sales to Total Assets	$\frac{\text{Net Sales}}{\text{Total Assets}}$	x 0.999
Equity to Debt	$\frac{\text{Market Value of Equity}}{\text{Total Liabilities}}$	x 0.6
Working Capital to Total Assets	$\frac{\text{Working Capital}}{\text{Total Assets}}$	x 1.2
Retained Earnings to Total Assets	$\frac{\text{Retained Earnings}}{\text{Total Assets}}$	x 1.4

Appendix VI: Data sources and construction for variables used in the panel regression

Firm level data are from SET:

Investment is change in net fixed assets (Plant, Property, and Equipment)

Capital Stock is total assets

Sales are sales revenue

Liquid Assets are cash and short-term securities

Debt is total liabilities

Tobin's 'q' is calculated as: $\frac{\text{Market Value of Equity + Total Book Value of Debt}}{\text{Total Assets}}$

Data on Capacity Utilization Rates (annual average) are taken from Bank of Thailand's website.

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