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ภาวะหนี้ครัวเรือนไทย: ความเสี่ยงและนัยเชิงนโยบาย

Rising Thai Household Debt: Assessing Risks and Policy Implications

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สายนโยบายการเงิน

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บทสรุป

การเพิ่มขึ้นของหนี้ครัวเรือนไทยเป็นประเด็นที่ได้รับความสนใจอย่างแพร่หลายในปัจจุบัน งานวิจัยนี้ได้ประเมินความเสี่ยงที่เกิดขึ้นจากหนี้ภาคครัวเรือนและได้ชี้ให้เห็นถึงนัยเชิงนโยบายที่สำคัญ โดยใช้ข้อมูลจากโครงการสำรวจภาวะเศรษฐกิจและสังคมของครัวเรือนโดยสำนักงานสถิติแห่งชาติ และข้อมูลจากการสำรวจของธนาคารแห่งประเทศไทย รวมถึงฐานข้อมูลจากธนาคารพาณิชย์ต่างๆ เพื่อให้การวิเคราะห์ถึงสาเหตุและการกระจายตัวของหนี้ครัวเรือนเป็นไปโดยสมบูรณ์ยิ่งขึ้น

การศึกษาพบว่า หนี้ภาคครัวเรือนในระดับปัจจุบันนั้นยังไม่ก่อให้เกิดปัญหาต่อเสถียรภาพของระบบสถาบันการเงินและเศรษฐกิจมหภาค อย่างไรก็ดี ครัวเรือนบางกลุ่มโดยเฉพาะผู้ที่มีรายได้ต่ำ มีการศึกษาน้อย มีความรู้ความเข้าใจทางการเงินไม่มาก หรือพึ่งพาแหล่งเงินทุนนอกระบบเป็นหลัก ได้แสดงให้เห็นถึงสัญญาณของภาวะกดทางการเงินอันเกิดจากการมีภาระหนี้หนัก นอกจากนั้น ครัวเรือนบางกลุ่มอาจจะมีความเปราะบางจากการคาดการณ์อนาคตด้านรายได้และทิศทางอัตราดอกเบี้ยดีเกินความเป็นจริง รวมทั้งปัจจัยเสี่ยงจากทัศนคติเกี่ยวกับการผิดนัดชำระหนี้และการคาดหวังความช่วยเหลือจากรัฐบาลซึ่งอาจมีนัยต่อเสถียรภาพของระบบสถาบันการเงินเฉพาะกิจและภาระผูกพันของภาครัฐได้ในอนาคต บทความสรุปด้วยการเสนอแนวทางนโยบายเพื่อรองรับความเสี่ยงที่อาจเกิดจากระดับหนี้ภาคครัวเรือนที่สูงขึ้น   รวมถึงมาตรการเพื่อเสริมสร้างความเข้มแข็งให้กับภาคครัวเรือนภายใต้การเข้าถึงแหล่งทุนที่จะมีมากขึ้นในอนาคต

บทสรุปสำหรับผู้บริหาร
ภาวะหนี้ครัวเรือนไทย
ความเสี่ยงและนัยเชิงนโยบาย

ในช่วงหลายปีที่ผ่านมา หนี้เฉลี่ยของครัวเรือนไทยได้ขยายตัวอย่างรวดเร็ว โดยสัดส่วนหนี้ต่อรายได้เพิ่มขึ้นเท่าตัวนับจากช่วงก่อนวิกฤตเป็นต้นมา ซึ่งปรากฏการณ์ที่คล้ายคลึงกันนี้ก็เป็นสิ่งที่เกิดขึ้นในหลายประเทศเช่นเดียวกัน สำหรับประเทศไทยนั้น การเพิ่มขึ้นของหนี้ได้กระจายตัวไปในทุกกลุ่มรายได้และกลุ่มอายุของครัวเรือนที่อยู่ในทุกภาคของประเทศ การเพิ่มขึ้นของหนี้ครัวเรือนสู่ระดับซึ่งไม่เคยมีมาก่อนนี้จึงเป็นประเด็นเศรษฐกิจที่ได้รับความสนใจอย่างแพร่หลายในปัจจุบัน

โดยหลักการแล้ว การเพิ่มขึ้นของหนี้ภาคครัวเรือนไม่จำเป็นจะต้องเป็นปัญหาเสมอไปเพราะเป็นสิ่งที่สะท้อนให้เห็นถึงสภาวะในบางช่วงของครัวเรือนที่ปรารถนาจะใช้สินเชื่อเพื่อรักษาระดับการใช้จ่ายไม่ให้ผันผวนจนเกินไป และหากวิเคราะห์จากเครื่องชี้ฐานะทางการเงินของครัวเรือนไทยในระดับมหภาค (Macro-prudential Indicators) ปัจจุบันยังไม่มีสัญญาณที่บ่งชี้ว่าภาคครัวเรือนไทยมีหนี้สูงเกินไป หรือว่าคุณภาพของสินเชื่อของภาคครัวเรือนมีแนวโน้มเลวลง เพราะแม้ระดับหนี้ครัวเรือนจะเพิ่มขึ้นมาก แต่หากเทียบเป็นสัดส่วนต่อผลิตภัณฑ์มวลรวมในประเทศ (GDP) หรือต่อรายได้สุทธิของครัวเรือนแล้ว ยังอยู่ในระดับไม่สูงนักเมื่อเปรียบเทียบกับประเทศอื่นๆ ในภูมิภาคหรือกลุ่มประเทศที่พัฒนาแล้ว นอกจากนี้ แม้ว่าสัดส่วนหนี้เสียของสินเชื่อส่วนบุคคลจะยังอยู่ในระดับสูง ก็เป็นผลพวงจากช่วงวิกฤตเศรษฐกิจ และสัดส่วนดังกล่าวก็โน้มลดลงเป็นลำดับ

อย่างไรก็ดี ความเสี่ยงที่เกิดขึ้นในปัจจุบันก็คือ ครัวเรือนควรตระหนักว่าการเพิ่มขึ้นของระดับหนี้ต่อรายได้จะทำให้ครัวเรือนมีความอ่อนไหว (sensitive) มากขึ้นต่อปัจจัยเสี่ยงต่างๆ อาทิ การลดลงของรายได้ การว่างงาน และการเพิ่มขึ้นของอัตราดอกเบี้ยเงินกู้ ดังนั้น การเพิ่มขึ้นของหนี้ภาคครัวเรือนจึงมีความสำคัญและมีนัยอย่างกว้างขวางใน 5 ประเด็น ได้แก่ ฐานะทางการเงินของครัวเรือน เสถียรภาพของระบบสถาบันการเงิน เศรษฐกิจมหภาค สังคม และการดำเนินนโยบายที่เหมาะสมของผู้วางนโยบาย

งานวิจัยนี้ได้ศึกษาเพื่อตอบคำถามที่สำคัญ 5 ข้อ ได้แก่ (1) หนี้ครัวเรือนเพิ่มขึ้นด้วยสาเหตุใด (2) ความเสี่ยงที่ตามมาจากการเพิ่มขึ้นของหนี้ครัวเรือนคืออะไร และใครเป็นผู้ที่ตกอยู่ในกลุ่มเสี่ยงนั้น (3) อะไรคือนัยที่มีต่อเสถียรภาพของระบบการเงิน (4) นัยที่มีต่อการอุปโภคบริโภคและการออมโดยรวมเป็นอย่างไร และ (5) ผู้วางนโยบายควรดำเนินการอย่างไรเพื่อให้การเจริญเติบโตทางเศรษฐกิจสามารถเกิดขึ้นได้อย่างยั่งยืนในสภาวะที่หนี้ครัวเรือนกำลังก่อตัวสูงขึ้น

ในการศึกษาเพื่อตอบคำถามดังกล่าวนั้นจำเป็นต้องวิเคราะห์ข้อมูลหนี้ครัวเรือนลึกลงไปในระดับจุลภาค โดยงานวิจัยนี้ได้อาศัยข้อมูลการสำรวจครัวเรือนล่าสุด 3 โครงการที่สำคัญ ได้แก่ โครงการ

สำรวจภาวะเศรษฐกิจและสังคมของครัวเรือน โดยสำนักงานสถิติแห่งชาติ (ไตรมาส 1 ปี 2547) ประกอบกับข้อมูลจากการสำรวจของธนาคารแห่งประเทศไทย (ธปท.) 2 โครงการ คือ โครงการศึกษาความต้องการบริการทางการเงิน (ปี 2546) และโครงการสำรวจทัศนคติครัวเรือนต่อการก่อหนี้และการออม (ปี 2547)

งานวิจัยนี้ค้นพบว่า ในภาพรวมแล้วสถานการณ์หนี้ครัวเรือนไทยยังอยู่ในระดับที่บริหารจัดการได้และไม่น่าจะนำไปสู่ปัญหาในวงกว้าง แต่จะมีครัวเรือนเพียงบางกลุ่มที่มีความเปราะบางเป็นพิเศษต่อปัจจัยเสี่ยงต่างๆ ที่อาจกระทบต่อความสามารถในการชำระหนี้ได้ สำหรับครัวเรือนที่มีหนี้กลุ่มอื่นๆ ก็อาจได้รับผลกระทบจากปัจจัยเสี่ยงเหล่านี้เช่นกัน แต่ก็ยังมีความสามารถที่จะรองรับได้อยู่ โดยเมื่อปัจจัยเสี่ยงเกิดขึ้นทุกครัวเรือนก็จะต้องมีการปรับพฤติกรรมการใช้จ่ายให้สอดคล้องกับสถานการณ์ในอนาคต นอกจากนี้ การที่ครัวเรือนมีความเปราะบางมากขึ้นนั้นเป็นสิ่งที่สะท้อนให้เห็นถึงความอ่อนไหวต่อการดำเนินนโยบายการเงินในอนาคตมากขึ้น ดังนั้น งานวิจัยนี้จึงเสนอข้อเสนอแนะเชิงนโยบายให้มีการพัฒนาระดับความรู้ความเข้าใจทางการเงินของผู้บริโภค และการเพิ่มโอกาสในการเข้าถึงแหล่งเงินทุนในระบบสถาบันการเงิน ที่จะช่วยสร้างความมั่นใจได้ว่าครัวเรือนสามารถที่จะทำการกู้ยืมได้ โดยก่อให้เกิดความเสี่ยงต่อฐานะทางการเงินของครัวเรือนเอง ต่อระบบสถาบันการเงิน และต่อเศรษฐกิจโดยรวมที่น้อยที่สุด

งานวิจัยนี้ได้แบ่งการศึกษาเป็น 6 ส่วน ดังนี้ (1) บทนำ (2) การนำเสนอกรอบทฤษฎีที่ใช้อธิบายพฤติกรรมการบริโภคและการกู้ยืมของครัวเรือน ได้แก่ ทฤษฎีวัฏจักรชีวิต (Life-cycle Model) และทฤษฎีรายได้ถาวร (Permanent Income Theory) ที่ประยุกต์ให้เหมาะสมกับกรณีประเทศไทย เพื่อที่จะทำความเข้าใจในเหตุผลเบื้องหลังของการเพิ่มขึ้นของหนี้ครัวเรือน การศึกษาในส่วนนี้พบว่าอัตราดอกเบี้ยที่อยู่ในระดับต่ำ โครงสร้างประชากรที่เปลี่ยนไป และโอกาสการเข้าถึงแหล่งเงินทุนที่ดีขึ้นล้วนแต่มีส่วนก่อให้เกิดภาวะหนี้ครัวเรือนดังเช่นทฤษฎีได้กล่าวไว้ แม้สิ่งที่ค้นพบจะสอดคล้องกับทฤษฎีที่ว่า การเพิ่มขึ้นของหนี้ครัวเรือนเป็นผลสืบเนื่องจากระดับการพัฒนาทางเศรษฐกิจที่ดีขึ้น แต่ความเสี่ยงที่มีต่อเสถียรภาพเศรษฐกิจในปัจจุบันนั้นยังเป็นสิ่งที่ต้องศึกษาในลำดับถัดไป (3) การศึกษาข้อมูลของครัวเรือนทั้งข้อมูลในภาพรวมและระดับจุลภาค โดยวิเคราะห์การกระจายตัวของหนี้ครัวเรือนในมิติต่างๆ เช่น แหล่งที่ตั้งของครัวเรือน รายได้ อาชีพ แหล่งเงินกู้ และวัตถุประสงค์ในการกู้

นอกจากนี้ (4) การศึกษาความเปราะบางของครัวเรือนในระดับมหภาคและจุลภาค ซึ่งพบว่าเครื่องชี้ฐานะทางการเงินในระดับมหภาคของภาคครัวเรือนในปัจจุบันยังไม่มีสัญญาณบ่งชี้ถึงอันตรายใดๆ ในส่วนนี้ได้หยิบยกปัจจัยเสี่ยงต่อเสถียรภาพฐานะทางการเงินของครัวเรือนในด้านราคา รายได้ และอัตราดอกเบี้ยขึ้นมาวิเคราะห์ทางเศรษฐมิติโดยใช้แบบจำลองภาวะกดดันทางการเงินของครัวเรือนที่ประมาณขึ้นจากข้อมูลการสำรวจของ ธปท. และเมื่อผนวกผลการศึกษาดังกล่าวเข้ากับข้อมูลโครงการสำรวจภาวะเศรษฐกิจและสังคมของครัวเรือนของสำนักงานสถิติแห่งชาติแล้ว แบบจำลองชี้ให้เห็นว่าครัวเรือนโดยรวมมีความยืดหยุ่นพอสมควรในการรองรับปัจจัยเสี่ยงด้านอัตราดอกเบี้ยและรายได้ที่อาจ

เกิดขึ้น อย่างไรก็ดี ยังมีครัวเรือนบางกลุ่มที่แสดงถึงความเปราะบางเป็นพิเศษต่อปัจจัยเสี่ยงเหล่านี้ (5) การวิเคราะห์นัยที่มีต่อระบบสถาบันการเงิน และต่อเศรษฐกิจมหภาค ในส่วนนี้ได้ทำการเชื่อมโยงความ มีเสถียรภาพของภาคครัวเรือนเข้ากับระบบสถาบันการเงิน และค้นพบว่าความเสี่ยงที่เกิดขึ้นต่อสถาบัน การเงินนั้นมีไม่เท่ากัน นอกจากนี้ การเป็นหนี้ของภาคครัวเรือนยังแสดงนัยต่อเศรษฐกิจมหภาคจาก ความอ่อนไหวในการบริโภคภาคเอกชน และการลดลงของการออมภาคครัวเรือน

สุดท้าย (6) การพิจารณาแนวโน้มของหนี้ภาคครัวเรือนในอนาคต ซึ่งค้นพบว่า หนี้ภาค ครัวเรือนไทยจะยังคงเพิ่มขึ้นอย่างต่อเนื่อง แต่ในอัตราที่ชะลอลง จากข้อสรุปดังกล่าวจึงนำมาซึ่งการ เสนอแนะนัยเชิงนโยบายหลัก 3 ด้าน ประการแรก คือ **ด้านนโยบายการเงิน** การพิจารณาอัตรา ดอกเบี้ยนโยบายควรคำนึงถึงความเสี่ยงที่ภาวะอัตราดอกเบี้ยต่ำต่อเนื่องเป็นเวลานานจะนำไปสู่ปัญหา การสะสมหนี้เกินควรของภาคครัวเรือน ในขณะเดียวกัน ธนาคารกลางจำต้องตระหนักถึงประสิทธิภาพ ของนโยบายการเงินที่มากขึ้นเมื่อระดับหนี้ภาคครัวเรือนสูงขึ้น เนื่องจากการบริโภคและความสามารถใน การชำระหนี้ของภาคครัวเรือนจะมีความอ่อนไหวมากขึ้นต่อการเปลี่ยนแปลงของอัตราดอกเบี้ย ประการต่อมา คือ **ด้านนโยบายกำกับดูแลสถาบันการเงิน** ควรเพิ่มประสิทธิภาพของกรอบการกำกับ ดูแลสถาบันการเงิน โดยให้มีการตรวจสอบแบบบูรณาการเพื่อให้สถาบันการเงินที่ดำเนินธุรกิจให้บริการ สินเชื่อส่วนบุคคลอยู่ภายใต้มาตรฐานการตรวจสอบและกำกับที่รอบคอบและรัดกุมเท่าเทียมกัน และ ประการสุดท้าย **ด้านนโยบายพื้นฐาน** ภายใต้สภาวการณ์ที่สินเชื่อผู้บริโภคมีการเติบโตอย่างต่อเนื่อง ทุกฝ่ายที่เกี่ยวข้องควรร่วมมือกันเพื่อยกระดับตลาดสินเชื่อผู้บริโภคให้มีประสิทธิภาพและเสถียรภาพ ยิ่งขึ้น โดยมาตรการที่ควรให้ความสำคัญ ได้แก่ การส่งเสริมให้มีการจัดเก็บและร่วมกันใช้ฐานข้อมูล ประวัติลูกค้าระหว่างสถาบันการเงินต่างๆ อย่างแพร่หลาย การพัฒนาระดับความรู้ความเข้าใจทาง การเงินของผู้บริโภค การเพิ่มประสิทธิภาพของโครงสร้างทางกฎหมายเพื่อรองรับการปรับโครงสร้าง หนี้ส่วนบุคคลที่อาจเพิ่มขึ้นตามการขยายตัวของหนี้ภาคครัวเรือน และการสร้างฐานข้อมูลฐานะทาง การเงินของภาคครัวเรือนในระดับประเทศ

ทั้งนี้ แม้ว่าความเสี่ยงของภาวะหนี้ครัวเรือนในปัจจุบันยังอยู่ในระดับที่สามารถจัดการได้ แต่ ในระยะต่อไปที่ระดับหนี้จะก่อตัวสูงขึ้นอย่างต่อเนื่องนั้น ก็อาจจะทำให้เกิดปัญหาต่อเสถียรภาพ เศรษฐกิจขึ้นได้ ผู้วางนโยบายจึงต้องเตรียมพร้อมที่จะติดตามอย่างใกล้ชิดถึงความเสี่ยงสำคัญต่อ เศรษฐกิจที่อาจเกิดขึ้นอันเนื่องมาจากการเพิ่มขึ้นของหนี้ในภาคครัวเรือน นอกจากนี้ ภาคประชาชน จำเป็นต้องเรียนรู้การบริหารจัดการฐานะทางการเงินอย่างเหมาะสมในสภาวะที่มีการเข้าถึงแหล่งสินเชื่อ ได้มากขึ้น

Table of Contents

Part 1   Introduction

In the past few years, Thailand's average household debt has risen rapidly to unprecedented levels. The debt-to-income ratio has doubled since the pre-crisis years. This increase has been a widespread phenomenon. Debt has both risen across and permeated all income and age groups in all the five regions of Thailand. A central economic debate of the day is whether we, as a society, should be concerned about the rising and unprecedented level of debt borne by the household sector.

Figure 1.1 Average Debt and Income Per Household

Source: NSO, Author's calculation
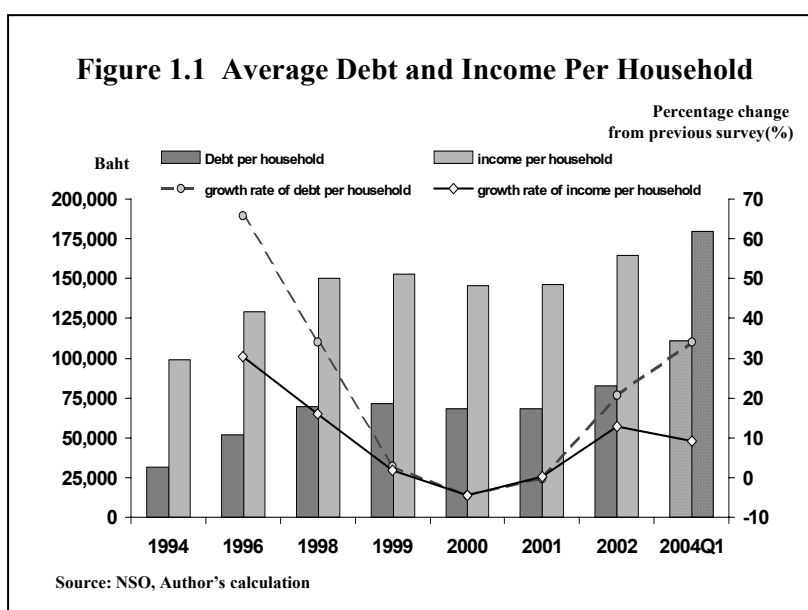
Rising household indebtedness is not necessarily a problem in itself, as it may simply reflect intertemporal tradeoffs by households to smooth their consumption over time. Most macro-prudential indicators for the household sector at present do not point to an alarming level of debt or deterioration of household credit quality. Despite recent sharp increases, Thailand's level of household debt expressed either as a share of GDP, or of disposable income, is still lower than or at least comparable to those of other regional and advanced economies. In terms of credit quality, the rates of non-performing loans for consumer credits, albeit remaining relatively high as a result of the crisis legacy, have been declining steadily.

Nevertheless, risks are present: higher leverage makes household's consumption and ability to service its debt become more sensitive to future adverse income and interest rate shocks. As such, the issue has important and wide-ranging implications on five tiers: the household's financial health, financial sector stability, the macro-economy, the integrity of the social fabric, and the appropriate responses of policy-makers.

This paper poses the following five key questions. First, what are the causes of rising household debt? Second, what are the attendant risks of debt to households and who are vulnerable? Third, what are the implications to the financial sector stability? Fourth, what are the implications for macroeconomic consumption and savings? And finally, what actions must policy-makers take to maintain stability and growth in the face of rising household debt?

Tackling these issues requires analysis and data at the microeconomic level. As such, this paper analyses and synthesizes findings from three timely surveys: the National Statistical Office's socio-economic survey (2004 Q1), and two Bank of Thailand surveys: the first being on financial access (2003) and the second being on household attitudes towards debt and savings (2004).

This paper finds that the present debt situation is not a cause for concern. However, certain pockets of the population are at risk from shocks that are amplified by the burden of debt. Most indebted households will also be affected thus but not to the point of stress. Their consumption will adjust accordingly. This increased sensitivity of households means that care must be exercised in using a more potent monetary policy. Policy recommendations include improving educational attainment, financial literacy, access to formal sector funds, and market institutions to ensure that households be able to borrow to serve their needs while minimizing the risks to households, the financial sector, and the macro-economy.

This paper is divided into six parts. Following this introduction, **part 2** briefly describes a theoretical framework suitable for understanding household consumption and borrowing. The theoretical framework is then applied to the case of Thailand in order to forge a deeper understanding of the factors behind the rise in household debt. This section finds that low interest rates, demographics, and declining borrowing constraints have contributed to rising indebtedness. **Part 3** focuses on an in-depth look at household debt statistics at both the macroeconomic and microeconomic level. A discussion of the distribution of household debt by, for example, income, occupation, geography, loan source and loan purpose is provided.

Part 4 gauges the vulnerability of households at the macroeconomic and microeconomic level. Macroeconomic indicators of household sector stability currently show no alarming signs. However, certain pockets of the population exhibit vulnerabilities. Threats to household stability in the form of price, income, or interest rate shocks, are identified and their effects on household stability measured using an econometric model of household stress. **Part 5** moves on the next two tiers: the financial sector and the macro-economy. We relate household stability to financial sector stability and find that the risks to financial institutions are not equally distributed. Furthermore, household indebtedness has clear implications for the macro-economy in terms of the increased sensitivity of consumption and the current fall in household savings.

Part 6 considers debt trends in the future and finds that Thai household debt will continue to grow, albeit at a slower pace. Given these developments, the section highlights three broad areas of policy implications. First, in terms of monetary policy, when setting policy rates, the authority should minimize the risks of excessive household debt accumulation as a result of interest rates being too low for too long, as well as take into account the increased potency of monetary policy as household consumption become more sensitive to interest rate change. Second, in terms of prudential policy, measures should be implemented to strengthen and consolidate a united supervisory framework that will augment quality of loan decision while not precluding access to debt. Lastly, given the global trend of continued growth in consumer credits, it is important that attentions are being paid to establish the necessary setting for a highly efficient consumer credit markets in the long run. Priorities include improving data collection and the greater sharing of consumer credit information among financial institutions, raising financial literacy and personal finance skills

among consumers, upgrading legal infrastructure for a fair and efficient consumer debt resolution process, and building high-quality national database on household balance sheets.

Main databases

An in-depth study of the household sector requires household data at the microeconomic level. As such, this paper relies principally on two household surveys: the National Statistical Office's socio-economic survey and the Bank of Thailand survey on household attitudes towards debt and savings. Details of the surveys follow.

Socio-economic survey (SES)

The survey, conducted by the National Statistical Office (NSO), collects information on household income, expenditures, debt, and household characteristics, covering country-wide samples of private, non-institutional households both in municipal and non-municipal areas. The survey is usually conducted every other year, except after the 1997 crisis to 2002 where it was conducted on annual basis but with a substantially smaller number of household samples in the odd year. For 2004, NSO has been conducting the survey throughout the year from January to December. Under the NSO methodology on collection period, all the sample households were divided into twelve equally representative sub-samples, each of which was interviewed during the period of one month. Coupling this with confirmation from NSO staffs, we believe that the data from the first quarter of the 2004 survey would reflect wide-ranging characteristics of households in the country and thus provide good representation for the financial positions of Thai households during the first three months of 2004. In this paper, we will mainly utilize the survey data from year 1996, 1998, 2000, 2002 and 2004Q1.

BOT survey on Household Attitudes toward Debt and Saving (HADS)

In order to improve the understanding and sharpen the analysis of household debt situation, the Bank of Thailand carried out a survey on Household Attitudes toward Debt and Saving (HADS). The survey was conducted during June 2004 and covered 2,800 households in all five regions of Thailand.

The aim was to gather a national database with a more qualitative nature to complement the quantitative data from the SES. The questionnaire is divided into 5 parts, (1) respondent and household characteristics, (2) household financial position with emphasis on debt holdings and perceived debt burden, (3) attitudes towards on borrowing and default, (4) attitudes towards savings, and (5) financial literacy.

The survey sample was generated from a stratified three-stage sample design in which regions are selected first, provinces second, and clusters of households last. Given the standard stratified design, sampling weights are calculated for use in obtaining estimates of population parameters.

Part 2 Understanding the causes of household debt increase

Thailand's rising household debt has been the cause of much concern. However, before we can begin to understand why household debt has increased to unprecedented levels, we must first comprehend why households seek to borrow in the first place. An understanding of household borrowing behavior entails an understanding of household consumption at the microeconomic level. An understanding of household consumption, in turn, should be formed on the basis of the theory of intertemporal choice which seeks to explain how individuals or households choose to allocate consumption over the span of their lives. Section 2.1 delineates the relevant theory and how the use of this body of economic theory will lend us insight into the relationship between household debt, demographics, interest rates and credit constraints. Section 2.2 takes the theoretical framework to Thailand in an attempt to forge an understanding of the causes behind the rise in household debt. This section of the paper will find that recent rise in household debt can in large part be explained by easing credit constraint due to lower interest rate and greater financial access, as well as changes in demographics which contributed to higher demand for household borrowing.

2a   Theory: The life-cycle model of household borrowing

Economic theory offers the life-cycle and the permanent-income model of Modigliani (1986) and Friedman (1957) as a useful starting point for inquiry. In this section, we shall describe the model's implications on household borrowing.

In the life-cycle model, a representative household chooses a path of consumption to maximize utility over its lifetime subject to an intertemporal budget constraint, which necessitates that the household cannot consume more than the sum of the present discounted value of its labor income and its current net worth (its assets less its liabilities)

$$\max E\left[\sum_{t=0}^{T}(1+\theta)^{-t}u(c_t)\right]$$

Subject to $A_{t+1} = (1+r)(A_t + y_t - c_t)$

Where c is consumption, y is the labor income, A is household's net assets, r is the rate of return on assets, and θ is the discount rate.

We can solve for the solution of this problem to reach the standard Euler equation:

$$E_t u'(c_{t+1}) = (1+\theta)/(1+r)u'(c_t)$$

In equilibrium, the ratio of marginal utility of consumption must be equal to the cost of intertemporal substitution, or the real interest rate. The solution to the Euler equation implies that households will try to maximize its lifetime utility by smoothing the path of consumption over their life cycle. Thus, in periods when income is low relative to average lifetime income, households will borrow (or use their assets) to finance current consumption. The loan will then be repaid (or assets being accumulated) in periods when income is high relative to average lifetime income.

In its simplest form, the model assumes that household's income steadily rises until retirement at which time it falls precipitously. Therefore, households dissave in the early part of their working life, and borrow freely against future income to fund current consumption. As the households gets older, and labor income rises, the level of debt declines. Once the debt is fully repaid, income is saved, and assets are accumulated. During their retirement, households again dissave by consuming out of earnings from their assets and steadily running down their asset holdings.

The following figure illustrates the stripped-down life-cycle model which encapsulates the main insights of intertemporal choice theory discussed above. For simplicity, the consumer is assumed to desire a consumption level that is constant throughout time.[1] For the sake of our analysis, we will treat the household as a single decision-making unit. Given the fact that loans for housing, automobile, and appliance purchases, which account for the bulk of household borrowing, are incurred for shared household consumption, we believe that this is a reasonable supposition.

The stripped-down life-cycle model shows how a young household must borrow against future income in order to reach its desired consumption level. Examples of such debt include those incurred for housing or automobiles. During the middle years when income is high, the household will save. During the retirement, the household will draw upon its accumulated assets in order to maintain steady consumption. The life-cycle models thus draws a link between age and indebtedness. Young households will tend to be indebted. And households whose income is below their average lifetime income will also tend to be indebted.

Figure 2.1   Life Cycle Hypothesis Framework
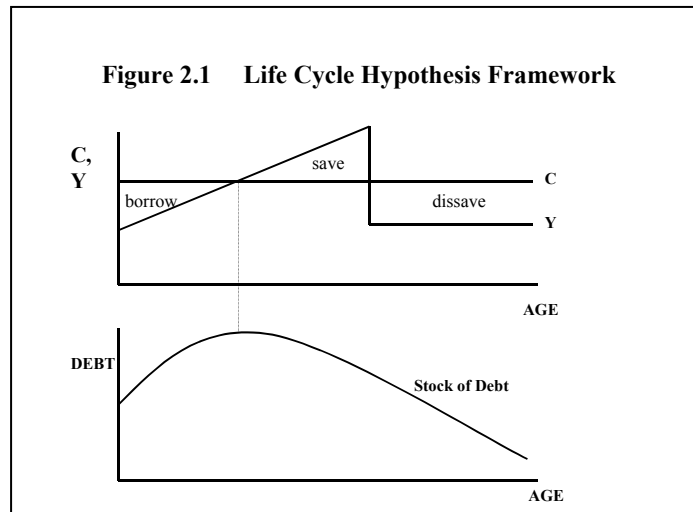
The basic insights of the life-cycle model can be extended to aggregate household borrowing. The model predicts that aggregate household borrowing depends on three main demand-side factors, namely:

1) <u>Demographics.</u> For example, an economy with relatively young demographic distribution will be more likely to be associated with higher level of aggregate household

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[1] This setup is similar to Modigliani's (1986) "stripped-down" version of the life-cycle model. Constant consumption is plausible given a zero real interest rate and the intertemporal additivity of preferences. We note that the model's insights are not sensitive to the this assumption.

debt, assuming that the attitude and preference toward debt does not differ across cohorts (for example, the cohorts that spent their childhood through economic crisis may have a lower preference for debt compared to those that lived through prosperous times).

2) Expectation of future income path. Household indebtedness tends to rise when people expect the path of future income to grow markedly, as households borrow more against their higher expectation of future income in the early periods to reach a more stable path of consumption.

3) Expectation of future interest rate path. The effect of changes in real interest rates on net aggregate indebtedness is theoretically ambiguous, depending on the relative magnitude of substitution and income effects. A decline in real interest rate decreases the cost of borrowing and increases the present value of future labor income, making it more likely for households to increase borrowings. On the other hand, lower real interest rates will reduce the returns on the household's assets, thus reducing their present value of earnings from asset holdings and lowering their desired debt holding. The overall impact is therefore different across households depending on their stages of the life-cycle. For example, younger households with prospects of higher future labor income are more likely to be attracted to borrow more by lower interest rates, whereas older households with accumulated wealth will be more likely to be affected by lower return on their assets and thus less likely to borrow.

The model described above so far focuses on the demand side factors of household borrowing, as it effectively treats that all households can borrow as much as and at any times they desire. However, in reality, the institutional features of lending side will also influence indebtedness, especially those that impose constraints on the ability for households to choose the amount of borrowing and the timing that are optimal for each household. Now, we will consider the implications of imposing the liquidity constraints within the life-cycle framework.

To illustrate the impact of the presence of liquidity constraints, let us consider the case of decisions to purchase housing, which is among the largest single expenditure among household loans. Most financial institutions will require some down payments as well as evidence of steady income prospects. Young households with small savings and initial uncertain income path will therefore not be able to take out mortgage loans. As their income and savings grow, their liquidity constraints will be gradually eased, and thus be able to borrow enough to buy the houses. This would contribute to the hump-shaped pattern of household debt and home ownership over the life cycle that is observed in many countries. Thus, liquidity constraints explain why changes in the structure of household credit markets and the degree of financial access by households would have a significant impact on the extent of household borrowing.

2b   The life-cycle model and Thailand's rising household debt

This section applies economic theory to Thailand's recent experience with rising household debt. Within the framework of the theory, we find that Thailand's low inflation, income growth, and demographic change have contributed to rising debt levels.

Lower interest rates and lower inflation

Interest rates in the Thai economy, both in nominal and real term, have been at a historic low over the past few years. While the MLR rates between 1980-2000 averaged at 13.4 %, it averaged only 6.6 since 2000 due to low inflation and excess liquidity in the banking sector. In effect, this has substantially reduced the cost of borrowing for households, thus making borrowing more attractive and affordable. More importantly, the principal reason that household debt has grown in recent years is that with lower interest rates, households can borrow more especially when borrowing for purchases of house or other durable items. A traditional benchmark used by financial institutions in deciding how much to lend to customers is that the required payment should not exceed 30 % of household income. Using this benchmark, it means that the maximum amount households could borrow will increase as interest rate declines. The left panel of figure 2.2 shows the impact of lower interest rates on initial debt to initial income ratio.[2] Indeed, this effect is quite considerable in magnitude. A reduction in MLR rate from 13.4 % (average1980-2000) to 6.6 % (average 2001-2004Q2) would increase the ratio of initial debt to initial income for an individual household from 2.2 to around 3.7.[3] This implies that household affordability for loan has increased and should lead to higher average size of new loan and eventually higher average debt per household with debt.

Figure 2.2 Impacts of Lower Interest Rates and Inflation Rates on Aggregate Debt to Income Ratio
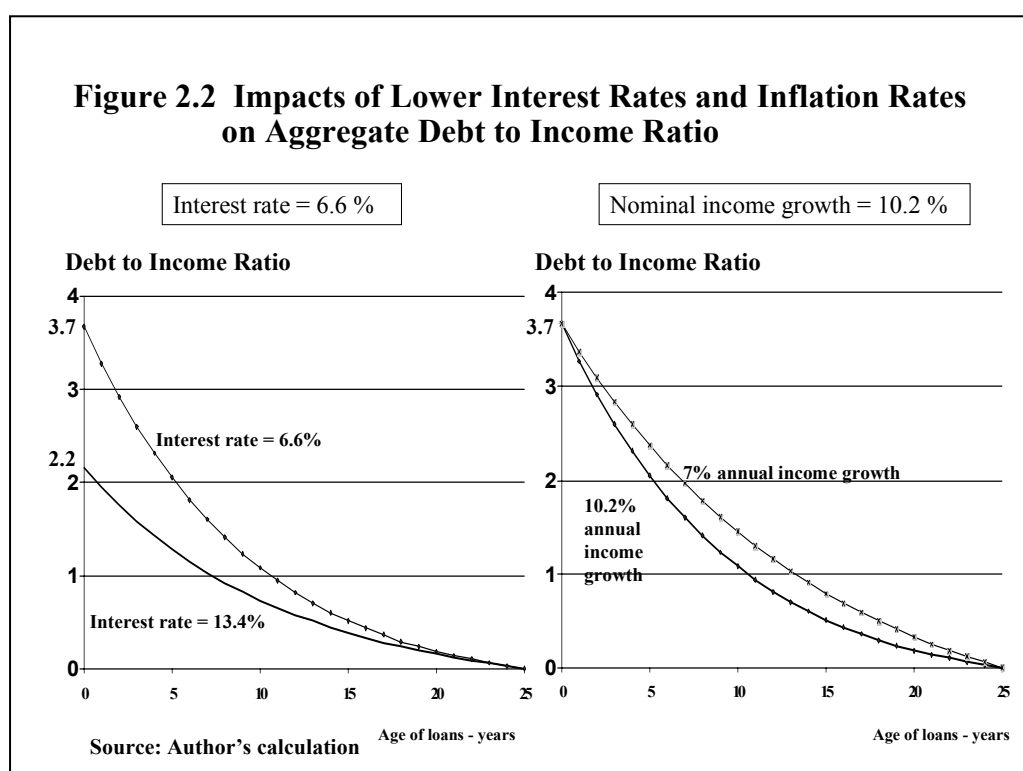
The rate of inflation also has a quantifiable impact on the household debt to income ratio. The effect could be divided into two parts. The first is that low inflation rate raises the

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[2] Here, we assume 30 % limit of required payment as percentage of household income, constant monthly payments, and nominal household income growth rate of 10.2 %, which is the average during 1980-2000 to trace out the projected path of debt to income ratio.

[3] Though interest rate is half in size, but the maximum amount of borrowing and the debt to income ratio do not double in size. This is because total payment include a component of principal repayments, which does not vary proportionately with the interest rate.

numerator (amount of debt) as low nominal interest rates associated with low inflationary environment, lead households to increase their borrowing. This is the effect that was described earlier. However, low inflation also has a separate influence on the household indebtedness via lower nominal income growth. When the growth of nominal income slow as a result of lower inflationary environment, the debt to income ratio will erode more slowly for each household than in a higher inflationary environment. This contributes to a higher aggregate household debt to income ratio.

During 1980 - 2000, headline inflation in Thailand averaged at 5.2 % per year. However, with general global trend of declining inflation (at least before recent upturn due to oil price rise) and the inflation targeting framework adopted by the Bank of Thailand, it likely that future average headline inflation for Thailand will decline. Therefore, in earlier decades with higher inflation and higher nominal income growth rate, borrowers could rely more on inflation to reduce the burden of their debt to their income. The effect of lower nominal income growth on the debt to income ratios is evident in the right panel of Figure 2.2. Here, we assume that future headline inflation rate will average around 2 % per year, and that there is no change in real annual income growth (5 %). Therefore, annual nominal income growth will decline from 10.2 % to 7 %. As the graph shows, the projected path of debt to income ratio for lower inflation and nominal income growth case is always above the path for the higher inflation and nominal income growth case. For example, after 10 years, the debt to income ratio would be 1.5 on the low-income growth path and 1.1 on the high-income growth path.

One of the key messages from this simple exercise is that lower inflation environment, if persisted for a long period, may induce households to increase their borrowing amount and end up spending relatively more time in the 'risky phase' (i.e. higher debt to income ratio) as nominal income growth rises more slowly than in the past. If they have fully factored this into their financial decision-making, it should not present a significant problem, but if they are still basing their decision on the assumption that inflation will quickly reduce debt burden like in the past, they would be taking more risk than they may have perceived.

Improved confidence on income and job prospects

Continued expansion of economic growth in 2002 and 2003, characterized by low unemployment and rising income has restored consumer confidence. With renewed confidence in income and job prospects, coupled with favorable loan terms, many households decided to take out loans to purchase assets such as housing, automobiles and appliances, some demand of which may have been delayed since the 1997 crisis. In the rural area, robust farm income also helped boost demand for durables including pick up trucks and motorcycles.

Demographics

The life-cycle model draws a link between a household's age and its debt. Consider the following figure which depicts Thailand's age profile of household debt to household income. The horizontal axis represents the age of the household's primary income earner. The vertical axis represents the debt to income ratio. The figure has three noteworthy points. First, the figure shows that the mean or median debt to income ratio steadily rises until the middle-aged cohorts at which point it steadily declines. This finding is consistent with the

life-cycle model. Second, the mean of the debt to income ratio is significantly higher than its median. This is indicative of Thailand's skewed distribution of debt in which the majority households have below average debt loads and a minority of households have above average debt loads. This is not surprising given the skewed distribution of income. Third, the change in the age profiles from 2002 to 2004 show an increase in indebtedness across all age groups, in particular the middle-aged groups. It should be noted that these age profiles are cross sections and, as such, does not imply that the profile represents the experience of each household over its lifetime.[4]

Figure 2.3 Thai Household's Age Profile of Debt to Income, All households, 2002-2004

Source: NSO, Author's calculation
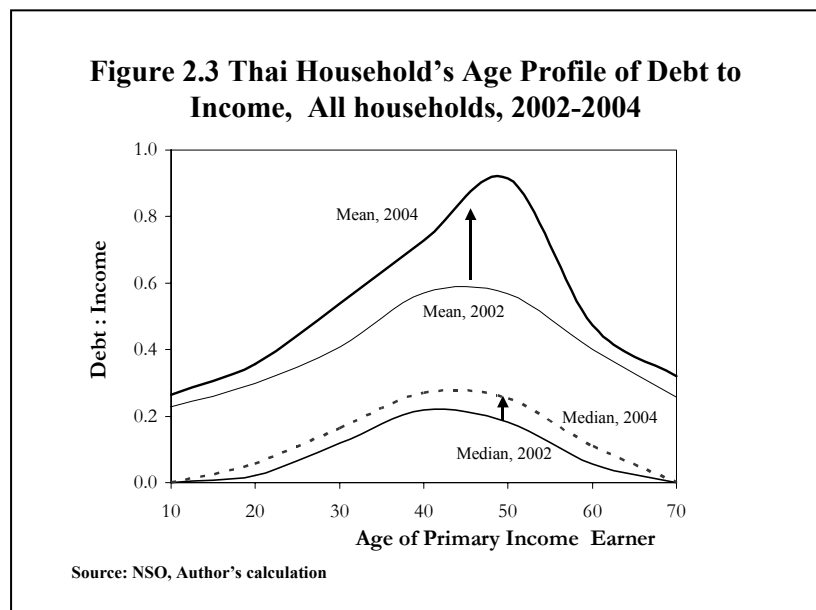
An ordinary least squares regression of household debt on various household socio-economic characteristics is consistent with the theory. Our regression model indicates a hump-shaped relationship between age and debt as reflected in our age profile. Young households tend to accumulate debt at a greater rate compared to old households. The coefficients on the linear and squared income terms are negative and positive, respectively, and indicate debt levels that are high at both low and high incomes. The debt levels attain a minimum around the 50th income percentile and then increase again. The fact that debt is high at low income is consistent with the life-cycle theory. However, high debt at high income is more difficult to explain. If high income households expect their future income to be higher, then borrowing would rational. The coefficient on falling interest rates is positive. Households facing falling interest rates will tend to borrow more, in keeping with the theory and the recent experience of Thailand. Estimating a similar regression within the NSO socio-economic survey gives consistent results.[5]

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[4] This issue can be addressed by analyzing cohort or, ideally, panel data.

[5] The SES regression model shows that household ownership of vehicles such as cars and pick-up trucks tend to be correlated with increasing household debt. Vehicles are one of the most expensive household durable purchases. The most expensive durable a household can own is its home. And in fact, households under mortgage loans tend to have more debt. These findings on the effect of major household durables ownership on debt are not surprising   For households to be able enjoy ownership of such costly durables over its lifetime, most households would have to take out loans to fund such purchases.

Table 2.1 Ordinary Least Squares Survey Regression of *Ln* Debt
BOT Survey on Household Debt

Variable	Coefficient	Base Unit	Survey Sample Mean Estimate
Ln Income	-2.13***		11.5
Ln Income^2	0.11***		133.45
Age, primary earner	0.07***		44.59
Age^2, primary earner	-0.0006***		2137.23
Primary	0.69**	No education	0.56
Secondary	0.99***	"	0.24
Certification	1.09***	"	0.05
Bachelor, or higher	1.62***	"	0.12
Education unknown	0.27	"	0.01
Δ Interest < 0	0.24***	Δ Interest ≥ 0	0.22
Home mortgage	1.14***	Home owner	0.06
Home rent	-0.13	"	0.13
Home stay	0.17	"	0.06
Home other	0.25	"	0.01
Household size	0.05**		4.13
Central	0.08	Bangkok	0.25
North	0.22	"	0.2
Northeast	0.14	"	0.32
South	0.30**	"	0.13

Number of obs: 1945; Population size: 11203126
Number of Jangwat: 14; Number of blocks/villages: 280; R^2=0.28

Note: ***, ** and * denote 1, 5, and 10% significance levels, with heteroskedasticity-robust standard errors

2c   Financial access and the fall of credit constraints

The household demand for borrowing

The above section's facts and regression results focuses on household debt as the outcome of both the market supply and demand for household loans. Bearing in mind that the demand and supply for household loans are separately determined, the question of which households are actually demanding loans naturally arises. The life-cycle framework presented above predicts that young households earning income below their permanent income will want to borrow. In order to examine the issue deeper we use the BOT consumer survey on financial access (2003)[6] and the following ordered logit model[7]:

$$y* = x\beta + e$$

where $y*$ is the number of borrowing services demanded and takes on values 1 to 5, x is a vector of socio-economic characteristics, and e is the error term. The results are presented below, with the final two columns indicated marginal probabilities of outcome 0 and 2

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[6] The BoT consumer survey on financial access (2003 Q1) was implemented to gauge the demand for financial services. The survey covers 4800 observations across all five regions of Thailand.

[7] The ordered logit model is an extension of the logit model and is used to explain ordered responses such as letter grades or bond ratings. Estimation is by maximum likelihood.

evaluated at the sample means. Our results suggest that low income, low age, low educational attainment, occupations as farm operator or low-skilled labor tend to be correlated with greater demand for consumer loans. The significance of the coefficient of the squared age term, although small, suggests a marginally hump-shaped relationship between age and borrowing demand. The findings on the marginal effect of income and age are consistent with theory. Regarding the findings on occupation, the positive coefficient on farm operators can be explained by the tendency for farm operators tend to require loans for investment and smoothing out seasonal shocks. A low-skilled laborer, hired on daily or weekly basis, may suffer from unstable income and hence desire loans to smooth out consumption.   Being in the central, northeast or southern regions relative to the Bangkok area is also correlated with greater demand for borrowing. A deeper look into regional issues concerning household debt is warranted, but beyond the scope of this paper.

Table 2.2 Estimation of Ordered Logit Model of Borrowing Demand					
Marginal Probabilities at Sample Means					
Variables	Coefficient	Mean	Base Unit	$P(y=0)$	$P(y=2)$
Income: 25,000-300,000	0.02	0.65	Income<25,000	0.01	-0.001
Income>300,000	-0.36***	0.06	"	0.05	-0.02
Age	0.08***	40.33		-0.01	0.003
Age^2	-0.001***	1881.41		0.0001	-0.0001
Farm operator	0.42**	0.06	Unemployed	-0.05	0.001
Salaried worker	-0.07	0.38	"	0.01	-0.002
Entrepreneur	0.03	0.41	"	-0.01	0.001
Labor	0.33**	0.06	"	-0.04	0.01
Bachelor or higher	-0.49***	0.15	No education	0.06	-0.03
Secondary	-0.06	0.26	"	0.01	-0.001
Primary	0.18**	0.39	"	-0.02	0.006
Married w/ children	0.15**	0.66	Not married w/children	-0.02	0.006
Central	0.16**	0.20	Bangkok	-0.02	0.01
North	-1.49***	0.20	"	0.25	-0.11
Northeast	0.32***	0.20	"	-0.04	0.01
South	0.44***	0.20	"	-0.05	0.001
Rural	0.13**	0.45	Urban	-0.02	0.004

Number of observations: 4800; R^2=0.06
Note: ***, ** and * denote 1, 5, and 10 percent significance levels

Credit constraints: can households borrow?

Economic theory predicts how young households will seek to borrow to reach their desired levels of consumption. However, households may not find it easy to borrow against future income. Incomplete contracts and requirements regarding collateral, down payments, credit history, or income documentation, all serve to hinder households' abilities to borrow. These hindrances are termed credit constraints. Using the Bank of Thailand's survey on financial access (2003), we find that approximately 50 percent of surveyed consumers are under severe credit constraints. Furthermore, factors such as age, income, education, and occupation are able to explain the presence of the said constraints.
What is a severe credit constraint? Within the scope of this paper, a severe credit constraint is said to exist if at least one borrowing need is not met at all. For example, a consumer who applies for both a tuition loan and a personal loan and is accepted only for the latter is considered to be severely constrained. The constraint is severe in the sense that the consumer demands a positive personal loan amount but is supplied with not a partial but a zero amount.

We note that consumers not under severe credit constraints may in fact be facing milder credit constraints in which requested loan amounts are only partially met. However,

given the nature of the survey questions on needs for financial services, we can focus only on severe credit constraints.[8] We estimate a logit regression of the consumer's credit constraint status on various socioeconomic characteristics. The dependent variable y takes on the value of one if at least one borrowing need is fully unmet. The dependent variable y takes on the value of zero if all borrowing needs are met or if no borrowing needs exist. The estimated logit equation is:

$$ln\left(\frac{P_i}{1-P_i}\right) = \beta X$$

Where P_i is the probability of the household being severely credit constrained. Estimating the model we obtain the results presented in the following table.

Table 2.3 Estimation of Logit Model of Borrowing Constraint
Marginal Probabilities at Sample Means
BOT Survey on Financial Access (2003)

Variable	Coefficients	Sample Mean	Base Unit	Marginal Effect
Income: 25,000-300,000	-0.04	0.65	Income<25,000	-0.01
Income>300,000	-0.37**	0.06		-0.09
Age, Primary Earner	-0.11***	3.5		-0.03
Female	-0.16**	0.5	Male	-0.04
Farm operator	-0.42**	0.06	Unemployed	-0.11
Salaried worker	-0.05	0.38	"	0.01
Entrepreneur	0.02	0.41	"	0
Labor	0.42**	0.06	"	0.1
Secondary education	-0.13**	0.26	No education	-0.03
Bachelor or higher	-0.35***	0.15	"	-0.09
Central	-0.47***	0.2	Bangkok	-0.12
North	-1.71***	0.2	"	-0.39
Northeast	-0.16	0.2	"	-0.04
South	0.09	0.2	"	0.02
Rural	-0.12**	0.45	Urban	-0.03
Constant	1.18***			

Observations: 4800; R^2=0.08
Note: ***, ** and * denote 1, 5, and 10% significance levels, with heteroskedasticity-robust standard errors

We find that high income, high age, being female, a farm operator, or educated at the secondary level or above will tend to decrease the likelihood of being credit constrained.[9] High income and high age correlated with asset ownership, a requirement for many loans. Being a farm operator is correlated with ownership of land and livestock assets. Education may be significant as it signals good and stable income prospects.

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[8] Please see BOT Financial Access Survey (2003), question 10.
Respondents are asked to list up to five needed financial services (i.e. savings, borrowing, transfers, insurance, etc) from a menu. Seven borrowing services are included. Respondents are then asked whether the needed services are met.
[9] Paulson and Townsend (2002), using the Townsend-Thai panel survey of 15 households from each of the 64 villages across four provinces, find that wealth is the chief determinant of credit constraint. A limitation of our study is the omission of wealth data.

Being a laborer working on a weekly or daily will tend to increase the likelihood of being credit constrained. The regional dummies for the north and central regions are significant and negative indicating that being a resident of the north or central region will tend to decrease the credit constraint likelihood in comparison to being a bangkok resident. The rural dummy is negative. In the case of the northern dummy, one explanation for the negative sign is the relative lack of interest in borrowing among northern residents as mentioned above.

Using the logit model of credit constraint, we predict the probability of being credit constrained for some hypothetical cases as shown in the follow table. We stress that care should be exercised in interpreting the implications of a low credit constraint. A low credit constraint means either demand for borrowing is low or supply is high. For example, consider consumer with no interest in borrowing today and thus currently facing a low credit constraint. If the consumer should decide to borrow tomorrow, we cannot conclude that he will necessarily find willing lenders.

Table 2.4 Are You Credit Constrained?

Job	Age	Sex	School	Income	Region	Urban vs. Rural	Prob (constraint)
Civil Servant	50-59	F	≥B.A.	>25,000 <300,000	North	Rural	13%
Farm Operator	50-59	M	Primary	>300,000	North	Rural	13%
Laborer	25-29	M	Primary	<25,000	BKK	Urban	74%

Why have credit constraints fallen?

One reason for the rise in household debt has been the diminishing of credit constraints facing households. The relaxing of credit constraints has been brought about by an increase in the supply of funds for household loans and an improvement in the efficiency of the household loans market. The following table summarizes the key factors.

Table 2.5 Recent Developments in Financial Access	
Market Supply	**Market Efficiency**
Commercial Banks -Commercial banks' accumulation of liquidity has given households a larger pool of potential funds	*Industry competition* -The entry of foreign banks and other financial firms have heightened competition
Govt. Banks, SFIs -Government policy has encouraged govt. banks and SFI's to extend credit to constrained borrowers	*Public Credit Registries* -Credit bureaus have facilitated the sharing of information regarding borrowers
Consumer Credit -The proliferation of bank and non-bank credit card companies has led to a boom in credit card issuance.	*Credit Scoring* -Credit scoring practices have allowed banks to more accurately gauge loan risks on the mass basis

On the supply side, increased liquidity within commercial banks, as a result of the lull in corporate lending, have proven to be a boon to households in search of credit. In a loanable funds market that has traditionally favored the corporate sector, increased liquidity have provided households with a larger pool of potential funds from which to borrow. Furthermore, the government policy of encouraging government banks and SFIs to extend credit to households has proven to be effective. Households in rural areas that historically have had difficultly in accessing credit have been served by credit from governmental banks, village funds, and other SFIs. Lastly, the last few years have seen a boom in personal credit as evidenced by the sharp jump in credit card usage and balances.[10] It should be noted that not all positive credit cards balances require interest payment. However, outstanding personal credit balances still remain at low at less than 3 percent of household debt.

The rise in market efficiency arising from increased competition, credit bureau institutions, and advancements in risk management has also contributed to the lowering of the borrowing constraint of households. Following the crisis, the entry of foreign banks has led to increased competition within the banking sector. Increased competition has resulted in downwards pressure on interest rates, expanded credit coverage, and increases in loan amounts.

The banking business, by its very nature, is susceptible to informational problems. Limited information on borrowers' credit histories can lead to credit rationing. Public credit registries can go a long way in assuaging these impediments to financial market efficiency. As such, two credit bureaus, the Thai Credit Bureau (TCB) and the Central Credit Information Service (CCIS) have been granted operating licenses with precisely these aims in mind. The credit bureaus have facilitated the sharing of information on a given borrower's credit history. With such information sharing, the problem of adverse selection can be mitigated and banks can lend to consumers whom would have otherwise been declined. With information sharing, information rents earned by banks are lowered and banks will have to compete more for borrowers. As a result, banks will charge lower interest rates, thus increasing credit coverage.

However, the dispersion of information on consumers' credit records is not enough. Lenders need a way to measure the riskiness of a lender given his record. In this respect, banks have made progress by adopting modern credit-scoring methods for gauging loan risks. Credit scoring will allow banks to correctly price loans and increase loan coverage.

On a related note, the government's policy of increasing financial access has been synonymous with the targeted decrease of household reliance on informal debt. The BOT survey offers some preliminary evidence in support of success in this area. Approximately a quarter of indebted households within the BOT survey report being able to rely more on formal sources of debt as opposed to informal sources over the past three years.[11]

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[10] The sharp increase in credit card usage has led to concerns over excessive borrowing. It should be noted that not all positive credit cards balances attract interest. Visa International, which accounts for 80 percent of Thailand's credit card market, indicates that approximately 42 percent of Visa credit card balances attract interest. The remaining non interest-accruing share is accounted for by consumers who make payments on their purchases in the same period. Furthermore, the share of outstanding personal credit balances, unadjusted for the share attracting interest, still remain low at less than 3 percent of household debt.

[11] This finding is true across all income, age, and educational groups. For a more in-depth look, please see Ariyapruchya, Kiatipong and Nartnoi Kaewbanjong (2004) "Formal and Informal Credit Access in Thailand," forthcoming, Bank of Thailand
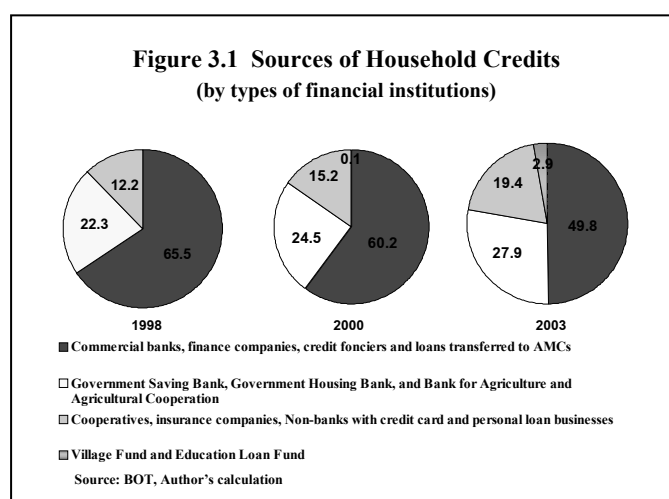
Future trends

Given our understanding of the causes of indebtedness, it is reasonable to project the continued growth in household debt, albeit a decelerated pace. One reason for the recent boom in household debt has been the confluence of many elements: low interest rates, income growth, and the expansion in credit access. These factors, together with the economic recovery, have allowed households to meet their post-crisis pent-up demand for durables and residential housing through debt financing. Household debt is therefore expected to decelerate as households satiate the said demand. Overall debt expansion is therefore expected to grow, albeit at a notably slower pace as a result of the fulfillment of demand for durables stock repletion. Looking ahead, the household debt level is projected to attain a higher level as a result a change in the age distribution of the Thai population. Our results suggest that young households tend to accumulate debt until the age of 50. Examining Thailand's age distribution below, we see that Thailand currently has a population distribution that is not uniform but skewed towards the younger ages. As these cohorts of younger households age, their debt burden will grow and so will the share of households within age brackets associated with high debt. If the Thai population's fertility rate remains stable at a medium rate as forecasted by the NESDB, aggregate household debt will grow purely just as a result of demographic change in the near future.

Figure 2.4 Thai Population Distribution by Age

Source: NESDB forecast, medium fertility
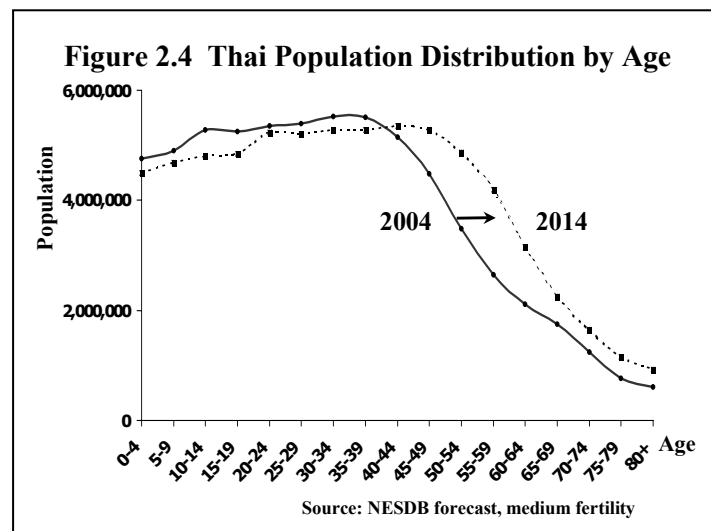
Part 3 Facts about household debt in Thailand

Sources of household credit

  Since the 1997 crisis, specialized financial institutions (SFIs) and nonbank financial institutions have gained market shares in the formal household credit market. Among the SFIs, the Government Saving Bank (GSB) experienced the highest growth of credit to households, averaging at more than 50 percent over the past 3 years. Non-banks, especially those companies that provide personal loans, hire purchase loans and credit card services to the mass consumers have expanded considerably over the same period as well. Among the traditional financial institutions, finance companies, which have lost their market share following the 1997 crisis, have regained part of the market share with the robust expansion in hire-purchase loans for cars and motorcycles. Moreover, a number of government initiatives, including the Village Fund have provided additional sources of fund for households, especially at the grass-root level.

Figure 3.1 Sources of Household Credits
(by types of financial institutions)

1998: 65.5, 22.3, 12.2
2000: 60.2, 24.5, 15.2, 0.1
2003: 49.8, 27.9, 19.4, 2.9

■ Commercial banks, finance companies, credit fonciers and loans transferred to AMCs

□ Government Saving Bank, Government Housing Bank, and Bank for Agriculture and
 Agricultural Cooperation
▨ Cooperatives, insurance companies, Non-banks with credit card and personal loan businesses

▨ Village Fund and Education Loan Fund

 Source: BOT, Author's calculation

  Although the majority of Thai households borrow from formal credit channels, a significant share still rely on informal credits to finance their expenditures.[12] Based on the HADS survey, 70 % of households with outstanding debt reported that their current outstanding loans are solely from formal credit sources. Meanwhile, 9 % report that they currently borrow from informal credits, either partly or solely. These figures are in line with those reported by the SES. (see Table 3.1 below) The last column of the table shows the shares in term of amount of outstanding loans. Once we break down the amount borrowed for the mixed group (those with loans from both sources), the proportion of loans for the entire household sector is about 75 % and 25 % for formal and informal sources respectively. It is worth noting that these numbers do not preclude the possibility that there may yet be a significant share of households without financial access to either formal or informal channels.

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[12] Here, we define formal credits as loans from any types of financial institutions as well as government funds, where non-formal credits are loans from non-institutionalized moneylenders, relatives, friends.

Table 3.1 Shares of Formal vs. Informal Credits

Percentage of households with debt	By number of households			By amount of outstanding credits
	HADS (2004)	NSO (2002)	NSO (2004)	HADS (2004)
Formal credits only	70.0	71	70	62.1
Informal credits only	9.0	17	15	5.6
From both sources	21.0	12	15	32.3
Total	100.0	100	100	100.0

Source: NSO, BOT's HADS survey

There are some evidences that there has been a gradual shift in household borrowing from informal to formal channels. From the HADS survey, roughly a quarter of households with debt reported that they have become less dependent on informal financing over the past 3 years due to improved access to formal credit. However, roughly the same amount (25%) said that this is not the case, while the rest (50%) never borrowed from non-formal channel. Taken together, the information seems to indicate that the efforts both by the private and public sectors to provide greater access to formal credits for the Thai household sector yield some positive results. Nevertheless, there remain significant portion of households that has no benefited from greater access to formal credits. However, based on the SES (2002, and 2004) (see the above table), the improvement appeared to be minimal.

Based on cross section examinations using HADS data, **some groups of households are more dependent on non-formal credit sources than the others.** Figure 3.2 illustrates some of the interesting distributional characteristics, based on shares of number of households with debt by sources of financing. A quarter of households with debt in Bangkok rely solely on informal credits, a much greater fraction compared to other regions. These could reflect the fact that the urban poor households in Bangkok with no collaterals may have even less access to formal credits compared to households in the provinces, which may benefit from various government lending mechanism either thru SFIs and other directed programs. Meanwhile, there is no clear pattern with level of household income. One possible explanation is the tendency for Thai households to engage in some informal borrowing with friends and relatives both for economic and social purposes, regardless of their income class. In terms of occupation, temporary workers are more dependent to informal credits as expected, since they are more likely to lack a stable job history and assets to serve as collaterals, both of which are among important criteria for formal credit approval. Lastly, shares of households relying only informal credits decline with age of main income earners.
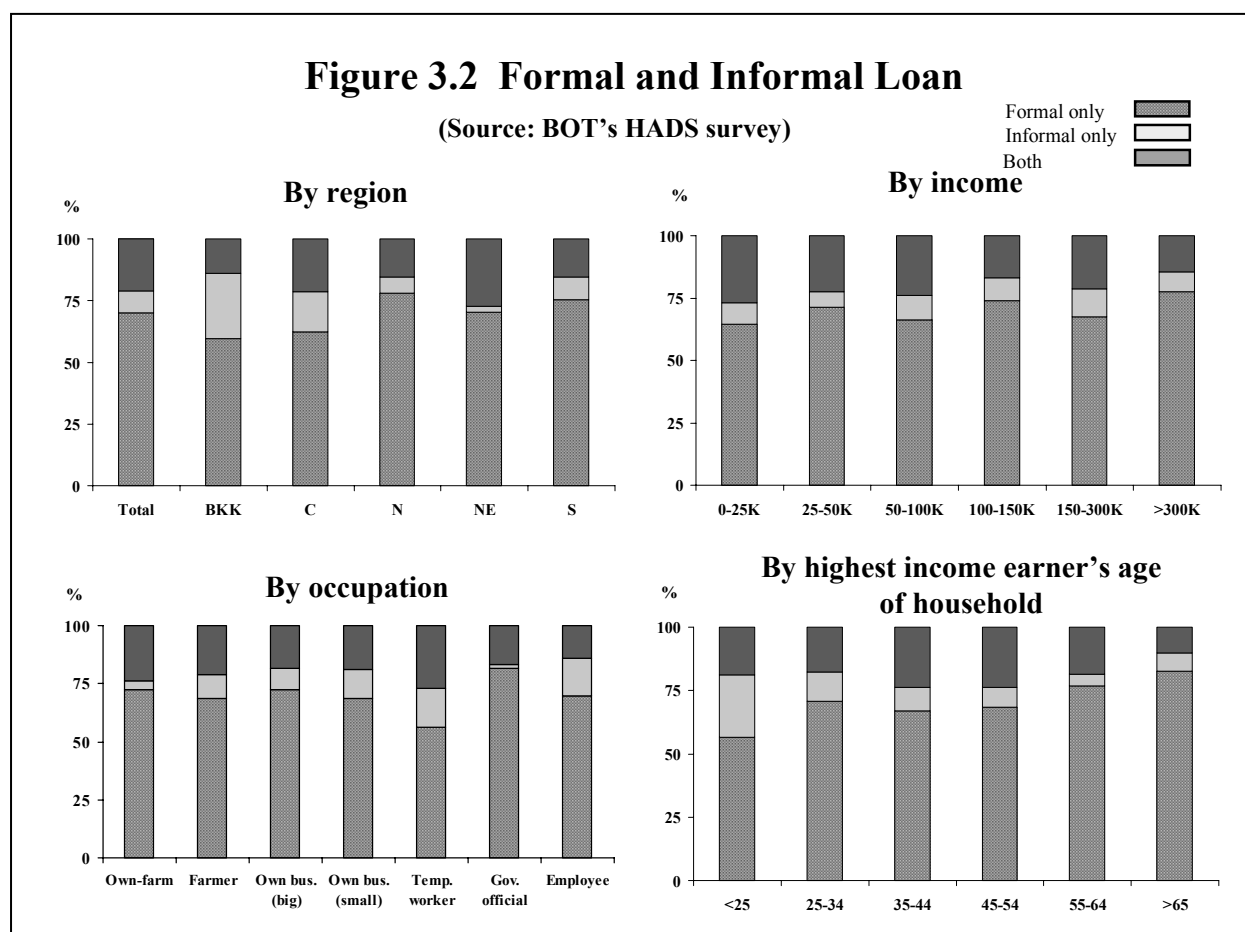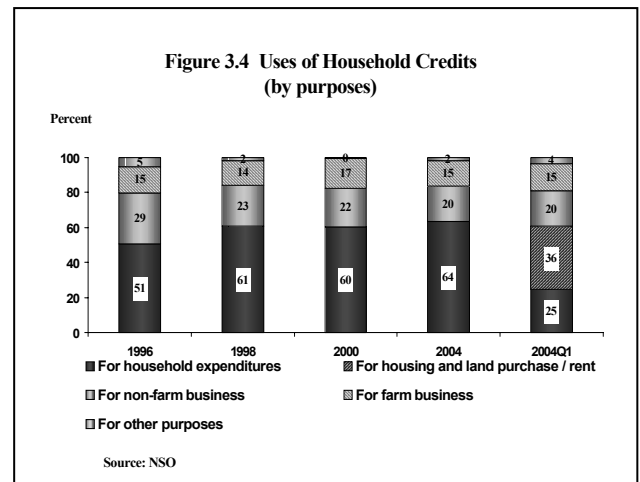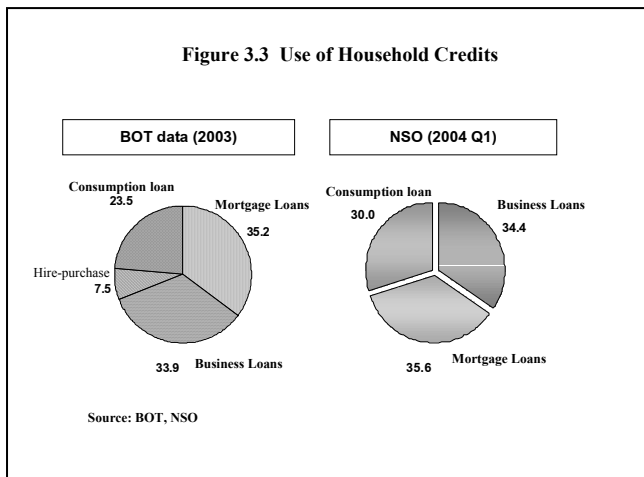
Figure 3.2 Formal and Informal Loan

(Source: BOT's HADS survey)

Table 3.2 Lending interest rate structure for informal credits (percent per month)

Rate	0%	>0-1%	>1-2%	>2-3%	>3-5%	>5-10%	>10-20%
% of total households	29.9	14.7	4.9	14.7	20.1	9.0	6.3

Source: BOT's HADS survey

       Information on lending interest structure for informal credits reveals broad dispersion in the household's cost of borrowing. Those who reportedly paid zero interest rate for their loans likely borrowed from their relatives or friends. Among those who do pay interest on their informal loans, most pay between 3-5 % per month (or 36 - 60 % per year). In addition, more than 15 % pay between 5 – 20 % per month (or 60 – 240 % per year). Thus, it seems that lack of access to formal credits may subject a sizable portion of households to exorbitantly high interest rates. However, more information is needed to analyze the extent to which these seemingly high rates represent risk premia or rents to monopolistic money lenders.

Uses of loans

Figure 3.3 Use of Household Credits

BOT data (2003)

Consumption loan 23.5
Mortgage Loans 35.2
Hire-purchase 7.5
Business Loans 33.9

NSO (2004 Q1)

Consumption loan 30.0
Business Loans 34.4
Mortgage Loans 35.6

Source: BOT, NSO

Figure 3.4 Uses of Household Credits (by purposes)

Source: NSO

**More than two-thirds of credits to households is used for asset accumulation or business loans.** Data from both the NSO survey (2004Q1), which include non-formal credits, and the BOT database (at end of 2003), which include only formal credit sources, share similar patterns. Mortgage loans accounts for the biggest share around 35-36 percent of total loans. Business loans rank second and the NSO data shows that the share of business related loans has declined slightly since the 1997 crisis.

Figure 3.5 Housing Loans by Financial Institutions

Commercial banks — SFI — Finance companies — Total

Source: BOT

Figure 3.6 Hire-purchase Loans and Car Sales

Motorcycle (RHS)
Passenger car(LHS)
Hire-purchase loans (LHS)

Source: BOT
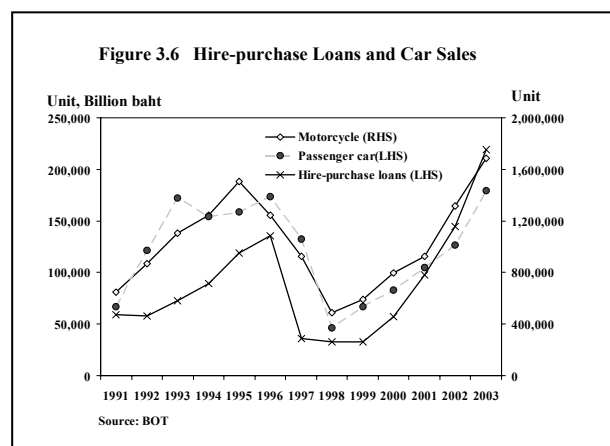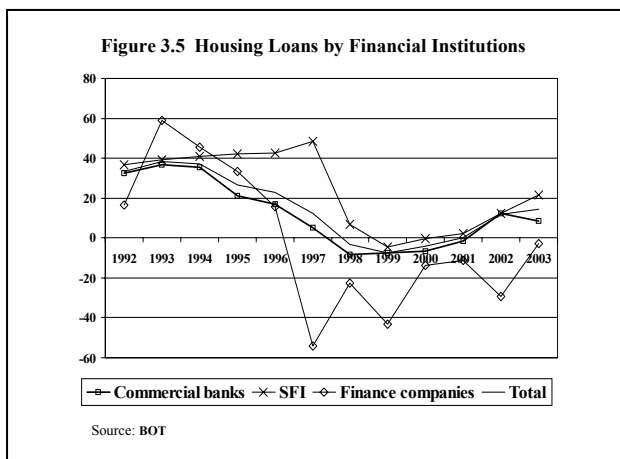
Housing loans have expanded favorably over the past two years, averaging over 14 percent growth annually. Commercial banks and the Government Housing Bank account for 50 and 40 percent of market share, respectively. The strong resumption in mortgage loans fueled the activities in the real estate sector, which were further supported by improved consumer confidence, and tax incentive measures. Hire purchase loans also grew robustly in line with strong demand for new cars and motorcycles. Indeed, the number of cars and motorcycles sold as well as hire purchase loans outstanding are now back at the peak before the 1997 crisis.

Figure 3.7 Household Asset Accumulation

Unit / Household

Source: NSO Survey
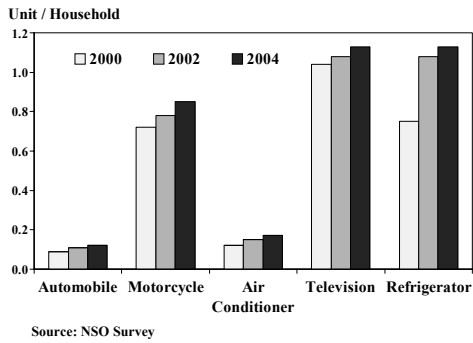
The NSO data also reveals that household have accumulated higher amount of physical assets, including durable items. The rise in household asset is partly financed by strong growth in household credits for asset purchase over the past few years. Unfortunately, we do not have the data (by household) on the value of housing, land and other financial assets. This prevents us from constructing the asset side of the household balance sheets.

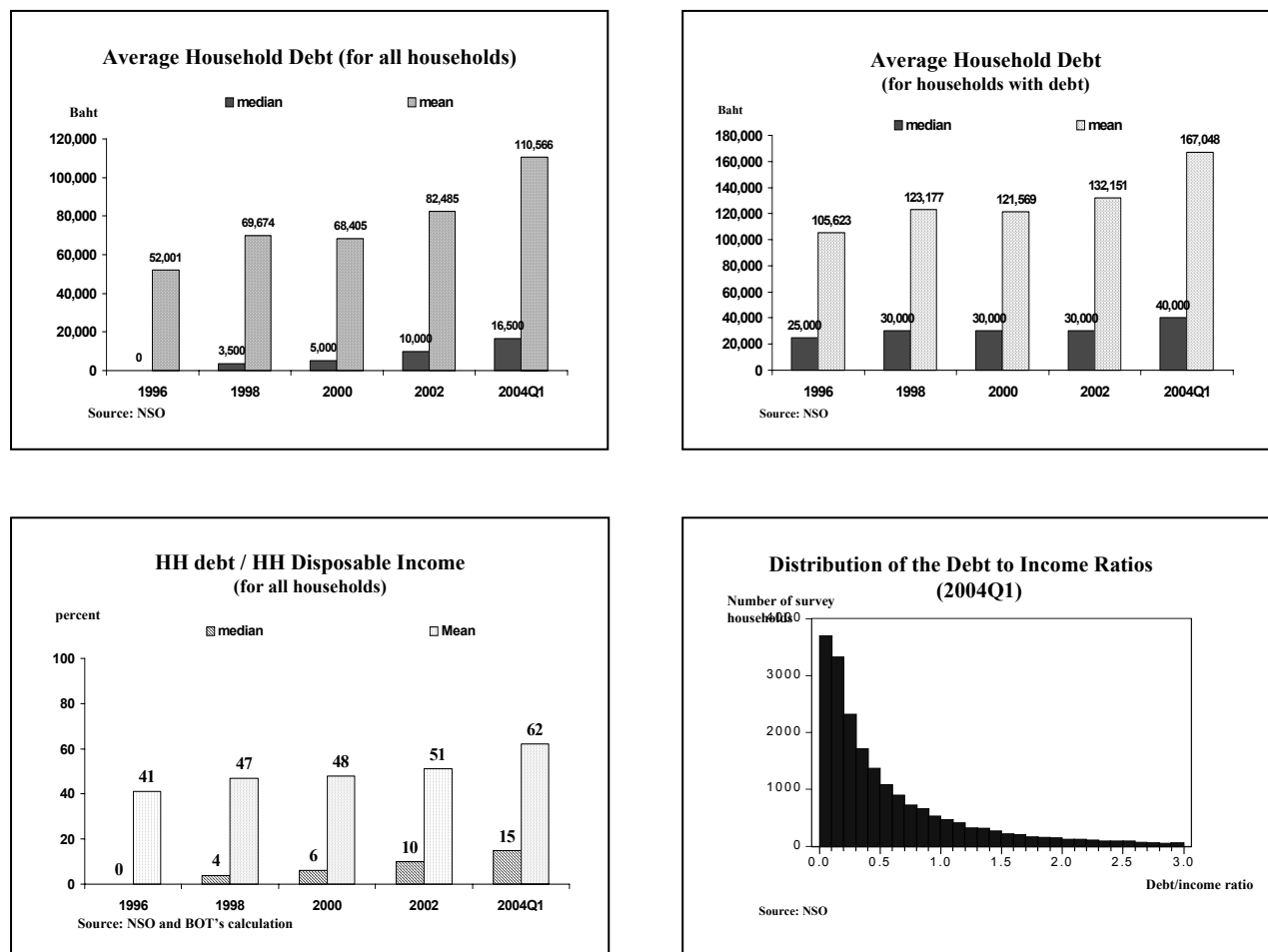**Figure 3.8 Growth of Credit Card (Credit Outstanding)**

Percent

Source: BOT
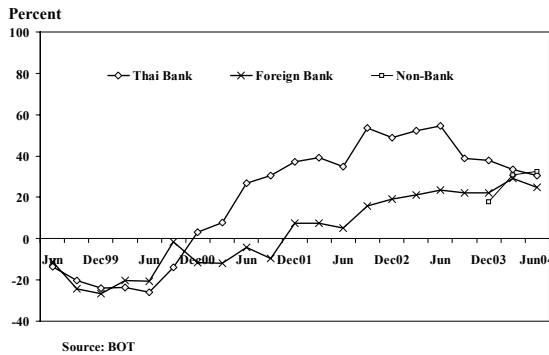
The growth of consumer spending has also been supported by the rapid expansion of credit card services. Between 1999 and 2004, credit card debt outstanding increased by more than two times. There are about 8 million credit cards in circulation in a country with a workforce of approximately 34 people. The pace of credit card expansion appears to slow down a bit, following the BoT's measures in April 2004 aimed at moderating the credit card usage, especially by low-income consumers.[13]

Distribution of household debt

　　Looking only at the aggregate data of the indebtedness of the household sector may conceal substantial and interesting variations in the distribution of the debt across individual households. It is important for policymakers and market analysts alike to aware of the debt distribution across groups of households as well as its implications. Given the variation in the debt burden across region, income or occupation groups, the impact of policies, such as a change in the policy interest rate, would likely have different impacts on different groups of households. Therefore, policymakers need to take into account of the distributional aspects of household debt burden when setting policies in order to achieve policy objectives while minimizing unintended or undesirable consequences.

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[13] Please see in the Appendix I for comparison of credit card development in Korea and Thailand

Figure 3.9 Average, Median and Distribution of Household Debt and the Debt to Income Ratios

Average Household Debt (for all households)

Average Household Debt (for households with debt)

HH debt / HH Disposable Income (for all households)

Distribution of the Debt to Income Ratios (2004Q1)

From the set of figures above, we can see that the median level of debt per household for all households and for households with debt is much lower than the average level.   In terms of debt to income ratios, the mean level for all households is 62 %, while the median level is 15%.   The reason for this vast differences is that more than 30 percent of Thai households do not borrow, and for the majority of those that borrowed, their debt to income ratios are quite low.   Only a small percentage of households have very high levels of indebtedness.

Figure 3.10 Share of Indebted Households
(as share of total households)

Percent

Year	Value
1996	49.23
1998	55.08
2000	56.27
2002	62.43
2004Q1	66.17

Source: NSO

Figure 3.11   Contribution to Growth of Household Debt

■ Ratio of indebted households
□ Average debt of indebted household

During 1998 - 2002   During 2002 – 2004Q1

growth rate   growth rate

Total BKK C N NE S   Total BKK C N NE S

Source: NSO
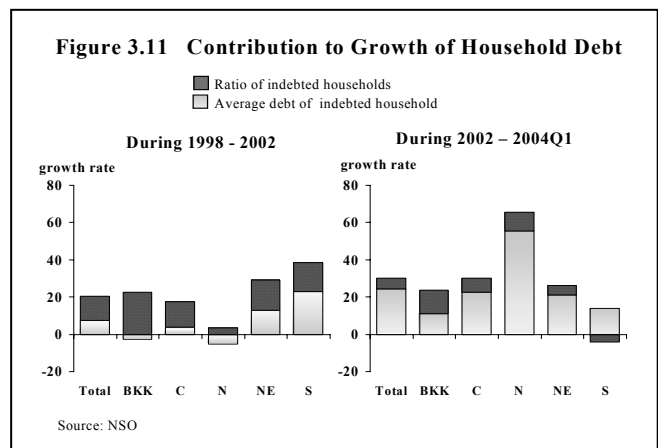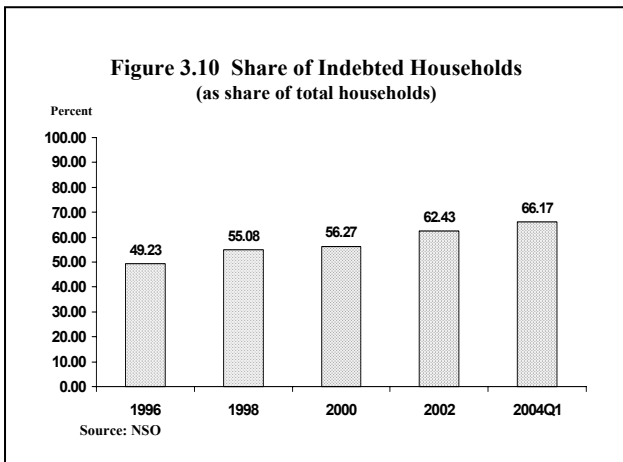
The share of households with debt has increased steadily, from 49 % in 1996 to 66 % of households as of 2004Q1. The rise in the share of indebted households accounted for most of the contribution to the rise in the debt to income ratios of all households during 1998 to 2002. This likely reflects greater financial access as described earlier.   However, during the 2002 – 2004Q1, the rise in the debt to income ratios was accounted mainly by the increase in the average debt for households with debt. In another word, those that borrowed decided to borrow more. This could be explained by the fact that, over this same period, loans for housing and hire purchase has expanded significantly due to a number of favorable factors, namely, historically low interest rates, rising consumer confidence, and attractive loan offerings.

There are many more dimensions of the distribution of household debt that could be analyzed, but we will highlight just two additional dimensions, namely income and occupation groups.

Figure 3.12 Growth of Household Debt (2002-2004Q1)
(by income group)

percent   ◆ growth (2002 - 2004Q1)

Household income (Decile)

Source: NSO

Figure 3.13   Share of Indebted Households
(by income group)

▨ Indebted household 2002   □ Indebted household 2004Q1

%

Household income (percentile)	2002	2004Q1
10	51	53
20	63	65
30	65	71
40	65	69
50	66	69
60	61	68
70	60	61
80	62	63
90	65	71
100	66	72

Source: NSO
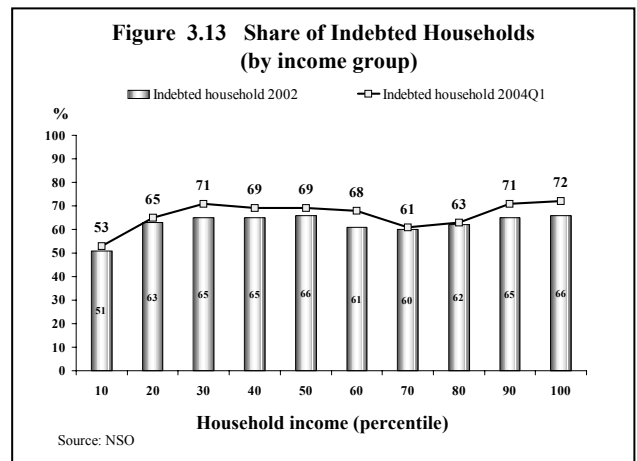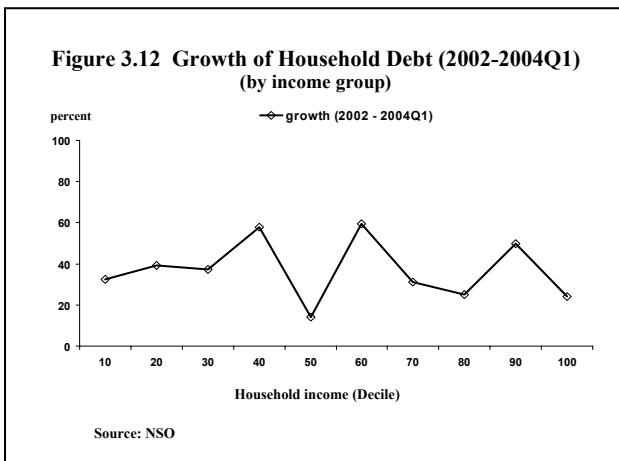
Share of households with debt and household indebtedness (as measured by the debt to income ratio) has increased across all income groups during 2002-2004Q1. We divide households into ten income groups (by income deciles) based on the SES data. Figure 3.12 shows that all income groups experience increase in household debt from 2002 to 2004Q1, with averaging growth rate of debt accumulation ranging from 14 to 60 percent. Meanwhile, Figure 3.14 displays the debt to income ratios by income group for both 2002

Figure 3.14 Debt to Income Ratio for Thai Households

2002

2004Q1

Household income (percentile)

Source: NSO
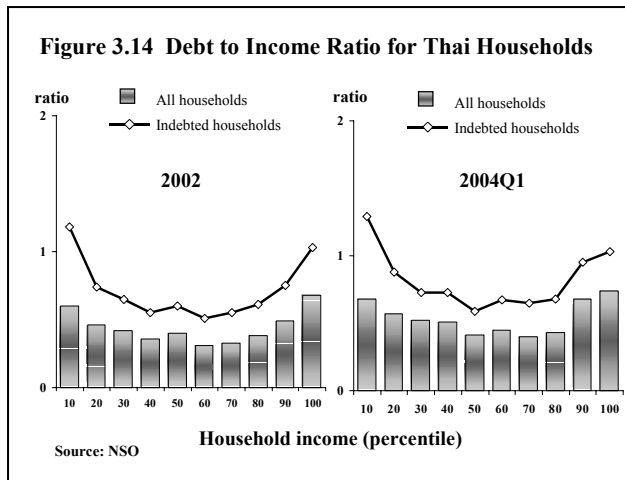
and 2004Q1. Both ratios for all households and for households with debt (with ratios being higher) have similar "smile" patterns, with the ratios for lowest and highest income groups being higher than the middle income group. With debt growth surpassing income growth (not shown), the debt to income ratios has therefore risen across all income groups over the past five quarters. However, overall patterns of the debt ratios between 2002 and 2004Q1 changed very little.

Data also reveals a number of interesting distributional aspects in term of occupational groups. The professional employee group has the highest indebtedness among all occupations both in term of absolute debt amount and debt to income ratio. Though in growth term, the group did not experience the highest growth of debt amount, but in absolute term, the group's debt increased the most over the past year. This could be explained by the fact that majority of their debt is for housing loan. So in terms of interest rate risk, this group will be the most vulnerable.

Figure 3.15   Household Debt by Occupation

baht / household

growth rate

Source: NSO, Author's calculation

Figure 3.16   Purpose of Household Borrowing

Source: NSO, Author's calculation

Figure 3.17   Debt to Income Ratio by Occupation

2002

2004Q1

1 = Farm operator (owning land)
2 = Farm operator (renting land)
3 = Own business (non-farm)
4 = Professional employee
5 = Farm worker
6 = Clerical & production worker
7 = Economically inactive

Source: NSO, Author's calculation

Compared to 2002, every occupational group has higher debt to income ratios in 2004Q1 except the farm worker group, whose borrowing is mainly for consumption and farm business. For clerical and production workers, their debt also rose significantly, but still have relatively low debt burden indicated by low debt to income ratio. For farm operators, as expected, most of their borrowings are for farm business related loans.
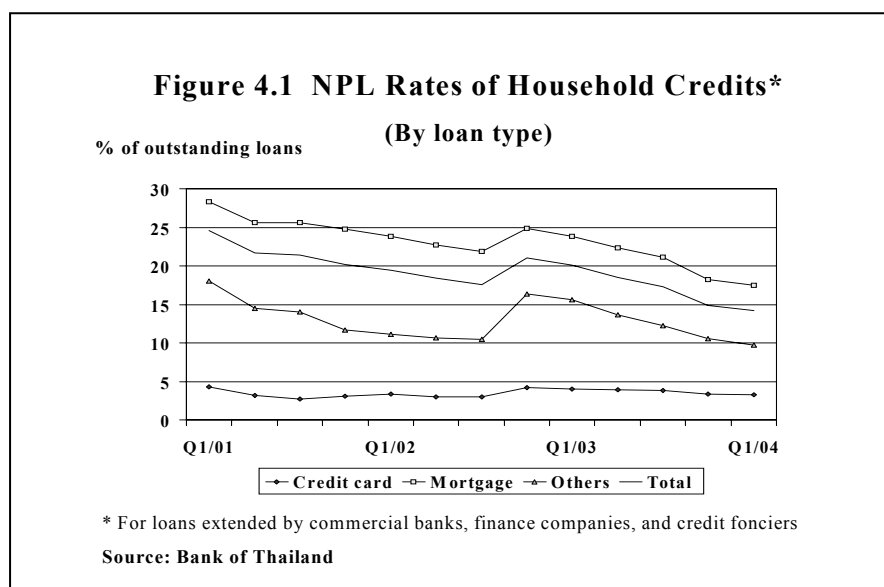
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Part 4 Assessing vulnerabilities of household's ability to service debt

The unprecedented rise in household debt raises the following questions Do households have too much debt? And which groups are relatively more vulnerable to adverse shock? This part adopt both macro and microeconomic approaches in addressing the said question. At the macroeconomic level, indicators of household credit quality, and overall debt interest payment trends are analyzed and compared at the international level. We find that at the macro level, household sector stability is still satisfactory.

At the microeconomic level, we examine which household demographic is particularly vulnerable. Indicators of vulnerability such as heavy debt burden perception, debt-to-income ratios, exposure to cyclical risks, over-optimism, and financial literacy are synthesized to form a coherent picture. Last, an econometric model of household debt stress is constructed to simulate household stress under various shocks. We find that on overall the household sector is resilient to shocks but some pockets of the population exhibit vulnerabilities.

4a Developments in household credit quality

Delinquency rates on household credits, albeit relatively high as a result of the legacy of the 1997 financial crisis, have declined steadily over the past few years.[14] Figure 4.1 depicts recent development of the ratio of non-performing loans, defined as loans with at least 3 months of non-payment, over outstanding household loans extended by commercial banks.[15] Among different types of household credits, mortgage loans have the highest NPL rate, following by other types of loans (e.g. consumer loans) and credit cards. The NPL rate for credit card loans by banks, in particular, remains relatively low by historical as well as international standards. Looking at these numbers, one is inclined to conclude that the credit quality of household credits has improved in recent years.

Figure 4.1 NPL Rates of Household Credits*
(By loan type)

% of outstanding loans

* For loans extended by commercial banks, finance companies, and credit fonciers
Source: Bank of Thailand

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[14] The slight jumps in the NPL ratios in Q4 of 2002 were due to changes in BOT's official classification of NPL, resulting in the NPL which had previously been fully provisioned being added to the pool of NPL under the banking sector's balance sheets. They did not, by any means, signal changes in credit quality of household credits.
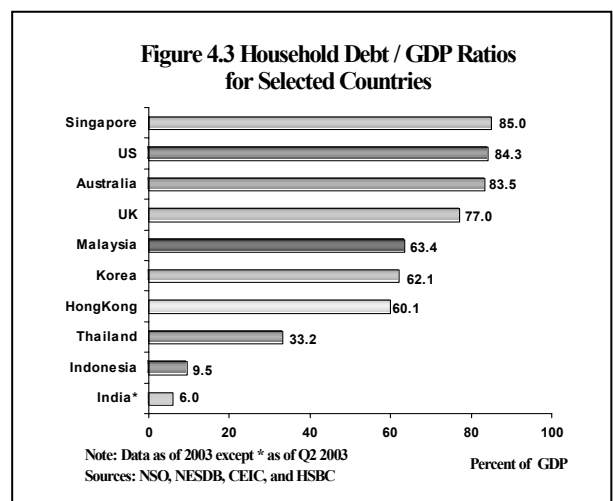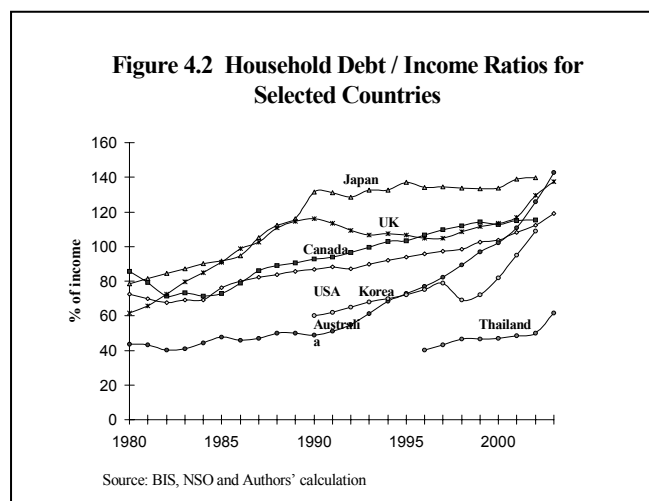[15] The NPL rate for specialized financial institutions (SFI)which cater mainly to the household sector, namely GHB, GSB, and BAAC, is approximately 14.5 % as of April 2003.

Nevertheless, there are problems with relying too much on the NPL or delinquency rates as warning signs for problems in household's credit quality. First, the recent decline in NPL rates could be attributed to the rapid growth of household credits in recent years as much as to the reduction in the amount of NPL themselves. Second, given the recent surge in household credits, we would not expect the nonpayment to increase significantly after only one or two years of borrowing especially during current period of relatively favorable macroeconomic conditions and credit access. One high-ranking bank executive with whom we spoke to pointed out that the NPL will probably not start to show significant rise until three years after initial borrowing. Lastly, NPL rate are subject to certain delay in reporting and thus could at best serve as a lagging indicator of household's credit quality.

4b Aggregate level: macro-prudential analysis and international comparison

Has the sharp rise in the household debt to income ratio observed in Thailand over the past few years mean that it is now too high, or has reached an unsustainable level? The precise answer may be elusive, but by considering key financial ratios which measures household's financial position should improve our assessment of households' ability to service debt as well as how vulnerable they are to potential shocks.

Following the convention in the corporate balance sheet analysis, we could focus our attention on two types of measures to gauge the strength of household balance sheet, namely the solvency and liquidity ratios.

Figure 4.2 Household Debt / Income Ratios for Selected Countries

Source: BIS, NSO and Authors' calculation

Figure 4.3 Household Debt / GDP Ratios for Selected Countries

Note: Data as of 2003 except * as of Q2 2003
Sources: NSO, NESDB, CEIC, and HSBC

The first financial ratio for households, which often cited as measure for household's solvency, is debt to disposable income. Figure 4.2 presents a comparison of household debt to income ratios for Thailand and a number of developed countries. The most obvious feature is that the ratio exhibits an upward trend in all countries, with most experienced the acceleration in debt accumulation since 1980s. Due to the lack of data, we can present the ratios for Thailand only over the past decade. Figure 4.2 also shows the considerable variation in household debt relative to income across countries.[16] Compared with other

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[16] One explanation for the variation across countries is the different statistical definitions of the household sector. In some countries like Canada, Japan, and Germany, the unincorporated business sector (generally small business run by households) are included in the household sector data. Thailand also belongs to this group as NSO does include the amount of credits that household borrowed for their businesses into the aggregate

countries' ratios, Thai household indebtedness remains relatively low. Figure 4.3 shows that the picture does not change much when comparing Thailand's debt to GDP ratio to that of other economies, including some regional economies with more comparable financial development to Thailand. By international comparison, Thai household indebtedness does not appear to be excessive.

However, this should not cause us to be complacent since, based on international experiences, there does not appear to be a predetermined level of debt to income ratio at which problems begin to happen. In the case of Japan, its household debt ratio peaked around 1.3 after the equity and property bubble burst, but it was corporate debt rather than household debt which fueled the bubble. In the UK, the ratio reached 1.15 in the early 1990s and then fell along with rising default rate. Since then the ratio has risen up again and now in the 1.20s without creating significant problems. Moreover, the debt to income ratio, though useful for a comparison of household indebtedness across countries, may not suitable as a measure for solvency as it is comparing a stock (debt) against a flow (income).

A better measure for solvency or debt sustainability would be the debt to asset ratio, sometimes called gearing or leverage. Unfortunately, there is no reliable national database on the value of household assets. The SES conducted by the NSO does collect information on household's physical asset holdings, such as units of car, motorcycle owned, but not in terms of value. Nor does it collect data on holdings of financial assets. Thus, it precludes us from calculating the gearing ratio for Thailand.[17]

Figure 4.4 Household Debt /Asset Ratios for Selected Countries

Source: BIS
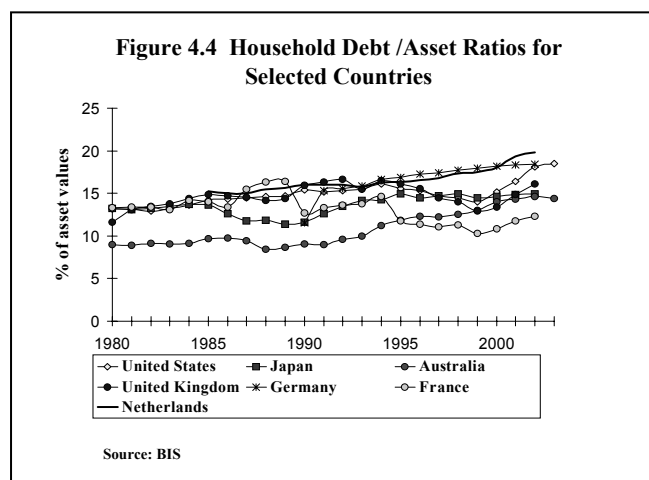
Nevertheless, we produce figure 4.4, which shows the developments of the gearing ratios in a number of developed countries over the past two decades in order to highlight how one can interpret the debt to asset ratios. As figure 4.4 illustrates, gearing has not increased nearly as dramatically in these countries, compared to using income as a scaling factor. Actually, in some countries like France, the ratio has actually declined. The relatively small rise in the gearing ratio was likely due to the steady rise in housing value over the period, which account for a significant share of household asset holdings. Also, in some instances, it reflected period of increase in equity wealth. As such, care must be applied when using this measure as an indicator of debt sustainability, since any significant fall in housing or equity prices could lead to a rapid deterioration of household gearing.

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household debt. On the other hand, some other countries do not treat the unincorporated business sector as a part of household sector. To the extent that the business sector tends to be more highly geared, it may affect the aggregate ratio. However, from the macro perspective, the precise definitions of household sector may not be crucial, but it is good to keep in mind the difference when comparing figures across countries.

[17] One household survey that does collect household asset value is Robert M. Townsend's (University of Chicago) Townsend-Thai project. Please see Appendix II for more details.

The most important financial ratio from the household perspective is the debt-service ratio – the ratio of interest payments to disposable income. Debt service ratio (or interest cover) measures household's liquidity position and thus its ability to service debt payment via its current flow of disposable income. As the debt service burden rises, it will increase likelihood of default as households have a smaller buffer against unforeseen expenses or income losses. Moreover, the incentives to declare bankruptcy also increase because the immediate consumption gains from bankruptcy are larger. The ratio sometimes includes principal repayment as well. However, due to the lack of information on amount of principal repayment, our definition of debt service will include interest payment only.

To calculate the debt service ratio for Thailand, we have to calculate the effective borrowing interest rate faced by average Thai household and multiply this rate to the amount of average household debt as reported by NSO. The effective interest rate is the interest r weighted by the household's sector share of outstanding loans by purpose and associated interest rates. The weighted interest rate r is calculated thus:

$$r = \frac{\sum_p r^p D^p}{\sum_p D^p}$$

where r^p is the interest rate of each loan type defined by purpose (i.e. mortgage, hire-purchase, personal loans, credit cards, investment) and D^p is the household sector's outstanding balance of each type of loan attracting interest.[18] According to our calculations and shown in Figure 4.5 (on the left and below), we calculate the present mean and median interest payment to income ratio for all households to be at approximately 5.8 percent and 1.5 percent of income, respectively.

In term of movements of the mean ratio over the past decade, it peaked in 1998 at 6.5 %, driven mainly by high interest rates following the 1997 financial crisis. Despite household income being outstripped by household debt over the 1998-2002 period, the mean ratio declined steadily owing to lower interest rate environment. However, by 2004, the growth of debt has surpassed the growth of income so considerably that the mean debt service ratio started to rise once again, in spite of low interest rates. As for the median ratio, it started in 1996 from roughly zero, reflecting less than half of Thai households borrowed at that time. Since then it has increased steadily in line with higher household indebtedness. The median ratio remains far below its mean counterpart, as a significant share of households remain free of debt together with the fact that the mean value was pulled upward owing to small number of households with considerable amount of debt.

However useful this measure is, it has the potential to misrepresent the impact of mortgage interest payment on household cash flows because of changes in home ownership. In case of Thailand, there appears to be an increase in home ownership in recent years. Therefore, households which previously rented will now have to pay the mortgage interest payment instead of rental. Thus, the rising debt service ratio may have overstated the impact of interest burden on their disposable income net of housing cost. On the other hand, since our debt service ratio does not include the principal repayment due to lack of information, it will understate the true debt service burden. In any case, the focus here is on how sensitive a

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[18] Unlike other types of loans, the total outstanding credit card balance does not attract interest.

representative household's debt service burden is to interest rate changes. In that sense, the analysis based on our calculation should be reasonable.

Figure 4.5 Debt Service Ratio for Thailand and Other Selected Countries
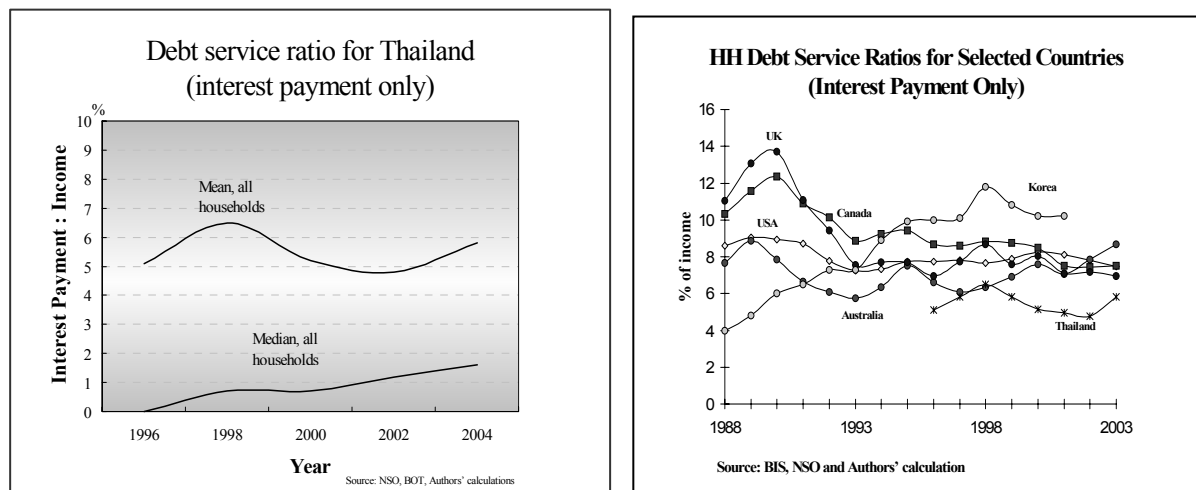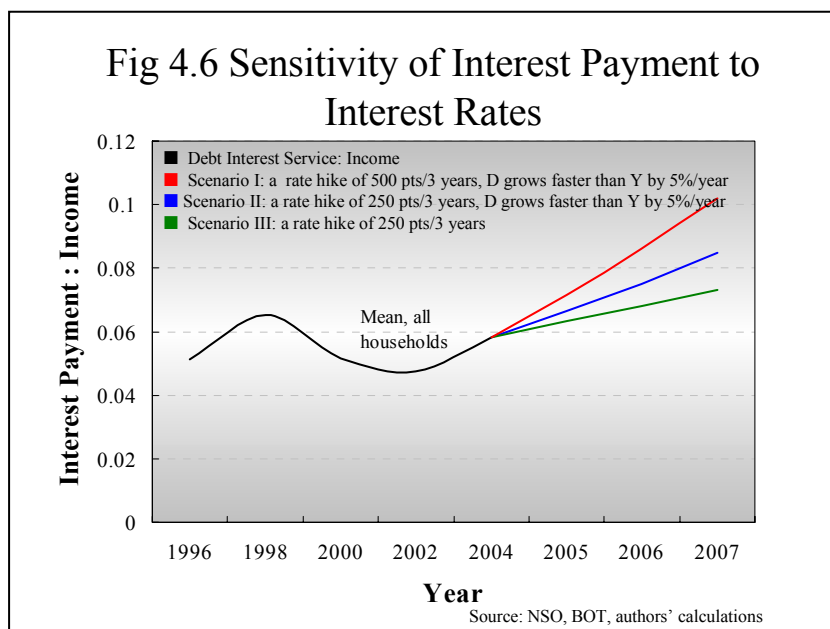

Figure 4.5 (on the right) reveal that the debt service ratios in most countries have been relatively stable in recent years, as the increase in household indebtedness has been offset by the decline in borrowing rates. However, with interest rates are on the rise in many countries, the ratios would most likely set to rise especially in countries with variable mortgage loans. Meanwhile, the ratios for South Korea have been relatively high in recent years. This most likely underlined the problem in the Korean household balance sheet which eventually culminated in rising delinquencies in credit card accounts in 2002.

Sensitivity of household interest service to interest rate shocks

Macroeconomic shocks, such as interest rate shocks may undermine the financial position of households, adversely affecting the health of financial institutions, and undermining the strength of economic growth. So as to understand trends in the interest rate burden[19] over time and into the near future, we conjecture a combination of changes in the debt-to-income ratio and the interest rate under three different scenarios. The first scenario is an extreme scenario in which the interest rate rises by 5.0 percent over three years and returns to a nominal rate consistent with the 15-year average real interest rate and low inflation. The second scenario has the debt-to-income ratio growing at 5 percent per year and the interest rate rising by 2.5 percent over three years. The debt-to-income rise is reasonable given the expected slow-down in debt growth from 30 to 15 percent and income growth remaining steady at 10 percent. The posited interest rate rise of 2.5 percent is consistent with market expectations. The last scenario has the debt-to-income ratio remaining constant in the face of an interest rate rise of 2.5 percent over three years.

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[19] One may ask why the interest payment burden is used over the debt service burden. Debt service is indeed a more accurate measure of a household's debt burden. However, no data exists on Thai households' overall debt burden. Since we are interested in comparing debt burden trends across countries, using the interest payment burden will suffice as the interest payment burden is correlated with debt service.

Fig 4.6 Sensitivity of Interest Payment to Interest Rates

■ Debt Interest Service: Income
■ Scenario I: a rate hike of 500 pts/3 years, D grows faster than Y by 5%/year
■ Scenario II: a rate hike of 250 pts/3 years, D grows faster than Y by 5%/year
■ Scenario III: a rate hike of 250 pts/3 years

Mean, all households

Interest Payment : Income

Year

Source: NSO, BOT, authors' calculations

The last scenario is noteworthy for the fact that the interest payment burden will exceed the historical high in 1998 simply on the back of rising interest rates even though the debt-to-income ratio remains constant. The first scenario has the interest payment to income ratio almost doubling. Even under the first scenario, Thailand's interest payment burden will not exceed international levels. The second scenario sees the ratio attaining 9 percent. We stress that a simple comparison of highs and lows across time is not enough to draw conclusions. The historical high during 1998 occurred following a systematic crisis, mostly arising from the excessive leverage in the corporate sector. It would therefore be unwarranted to conclude that household non-performing loans rate would substantially rise if the interest payment ratio exceeds the 1998 level. Nevertheless, we can conclude from this simple exercise that the Thai economy is headed for uncharted terrain in which Thailand's interest payment burden will approach international levels and households will have to learn to cope with unprecedented levels of debt servicing and increased sensitivity of discretionary income to interest rates.

4c Disaggregated level: which household groups are more vulnerable?

This section takes a microeconomic approach in discerning which groups of households are most vulnerable to difficulties in servicing debt. Difficulties in servicing debt may arise if households misperceive the true cost of debt or the impact of various shocks under the burden of debt. We make use of both quantitative and qualitative data in identifying households that are particularly vulnerable to shocks amplified by the burden of debt. In doing so, we ask four key questions. First, which households exhibit heavy debt burden? Second, which households suffer from cash flow problem. Third, do certain households have over-optimistic perceptions? And fourth, do households indicate varying degrees of financial literacy?
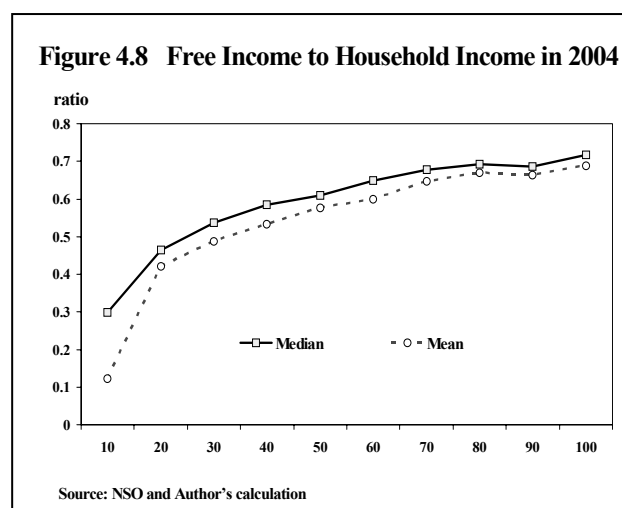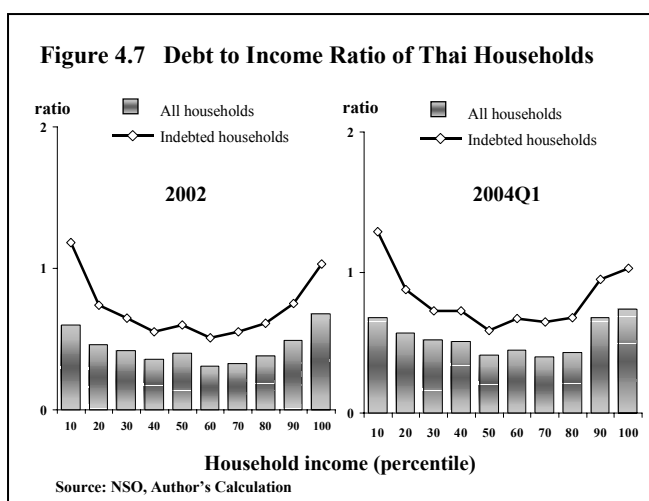
We find that certain groups of indebted households are indeed at greater risk than others. Low income households are particularly vulnerable to shocks given their high debt burden and low discretionary income. A large portion of households in the agricultural sector experience output price fluctuations and exhibit overly optimistic expectations of crop prices. Lastly, certain indebted households demonstrate low levels of financial literacy rendering them more vulnerable to financial stress.

(i) Which households have relatively heavy burden of debt?

One indicator of a household's debt burden is its debt-to-income ratio. One objection to this measure is its comparison of a stock variable to a flow variable. However, given that the flow of debt service is correlated with debt stock, we believe that the debt-to-income ratio is informative of households' debt burden.

Consider Figure 4.7 which depicts the distribution of households' debt-to-burden ratios by income deciles. In both 2002 and 2004 Q1, the distribution follows a curved line attaining its minimum around the middle deciles and its maxima at the lowest and highest income deciles.

Consider Figure 4.8 on average household free income by income deciles. We define free income as the household's total income minus committed debt interest payments and necessary expenditures such as food, housing, clothing, education,

Figure 4.7 Debt to Income Ratio of Thai Households

Source: NSO, Author's Calculation

Figure 4.8 Free Income to Household Income in 2004

Source: NSO and Author's calculation

marginal transportation costs, and medical bills. The remaining income can be interpreted as discretionary income available for household expenditures on durables, luxury items, or savings. Average free income is shown to be increasing in household income. It illustrates the striking point that low income households have particularly low levels of free income that can be used as a buffer in the event of shocks. The figures on free income and the distribution of debt-to-income ratios, taken together with the fact that low income households do not have much wealth, emphasize the vulnerability of poor households.

One admittedly difficult aspect in gauging the burden of debt is the incompleteness of information regarding each household's specific ability to service debt. Relevant information that is difficult to collect but pertinent to the gauging of the household's ability to service debt include, for example, the household's assets, debt profile, attitudes, financial literacy, and access to funds through its network of family, friends, or acquaintances. One way to circumvent this problem, as the BoT HADS survey does, is to simply ask the household directly if its debt burden is "heavy, somewhat heavy, or not a burden."

The following two figures summarize the findings from the said question. Figure 4.9 shows the distribution of perceived debt burden by region, income, debt level, and age for indebted households. It shows that more than a third of indebted households consider their debt burden to be heavy. The northeast region registers the highest share of households with high debt burden.[20] Low income groups tend to exhibit greater share of heavy debt burdens. With respect to age, very young and retirement-aged households show greater debt burdens due to their both falling into the low income bracket. Higher debt is also generally correlated with heavy debt burden. It is noteworthy that the highest debt amount shows a lower share of heavy debt burden than the second-highest amount. This can be explained by the fact that those able to borrow very high amounts are likely to be wealthy and thus own a disproportionate share of assets.

Figure 4.9   Perception of Debt Burden

Source: HADS Survey

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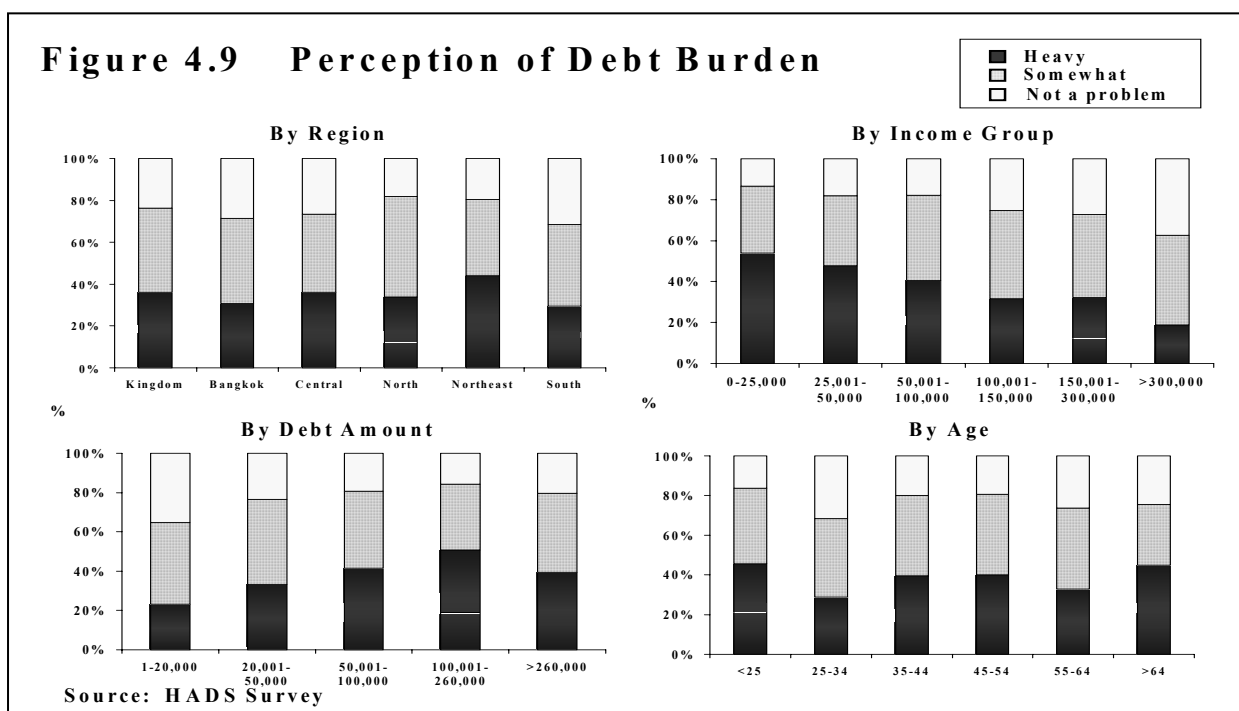
[20] One criticism of comparing perceived debt burden perception across regions is that the households of different regions may differ in their perception of what it means to have a heavy debt burden. A logit regression

Consider Figure 4.10 on debt burden perception which depicts the share of indebted households associated with a certain debt burden perception by different demographics. Low education is correlated with greater shares of heavy debt burden and possibly reflects the correlation of education with income and financial literacy. With respect to occupation, farme operators, small business owners, and temporary workers, or in other words households subject to the vicissitudes of the market or nature, exhibit higher debt burden. In terms of source of loans, households borrowing from informal sources tend to be associate with higher debt burden. The relationship between source of loans and debt burden is very possibly a two-way relationship in which stressed households in need of quick loans have to resort to informal channels or households are exploited by high interest rates of informal loans.
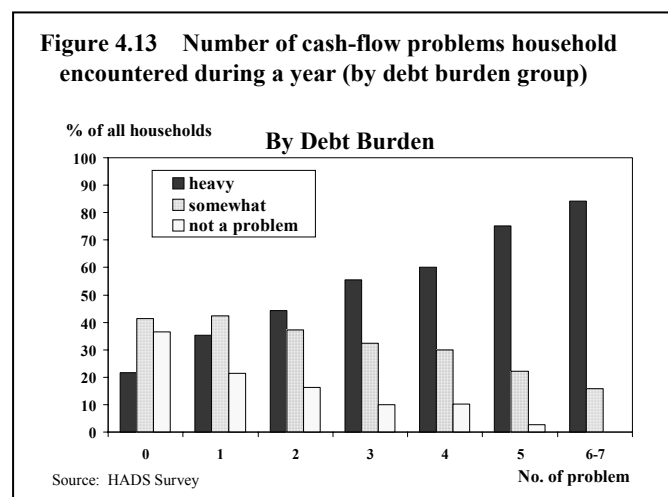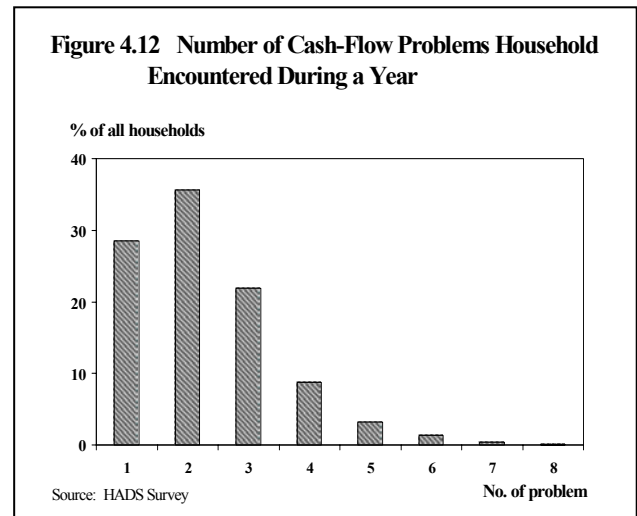

Figure 4.10 Perception of Debt Burden

Source: HADS Survey
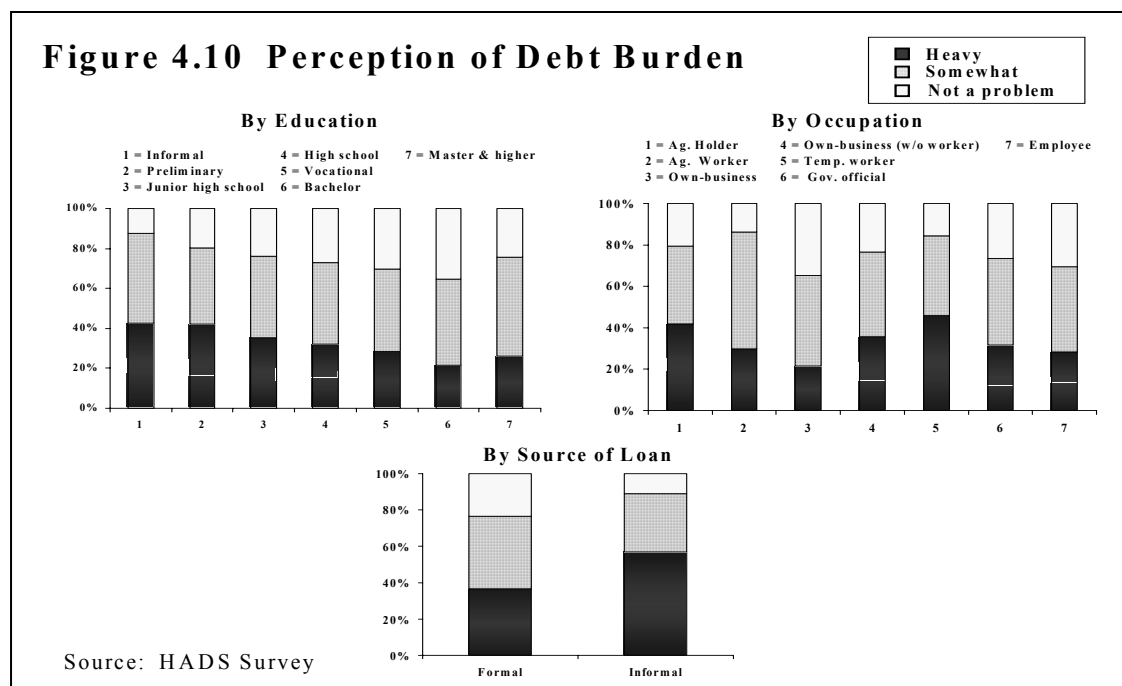
(ii) Which households are indebted and suffering from cash flow problem?

Another measure of household vulnerability is its degree of stress. Household stress is the presence of cash flow problems. A cash flow problem occurs when households have difficulty in meeting necessary payments. Alternatively, a cash flow problem can viewed as a level of free income that is dangerously close to zero. In this case, households will have the difficult choice of foregoing or delaying expenditures on necessary items. The BoT survey specifically asks if the household experienced any instance of cash flow problems within the last year from a list. Figure 4.11 lists seven possible answers as described in the following figure on cash flow problems. A strikingly large 51 percent share of all households relied on help from family or friends in dealing with cash flow problems. The next most prevalent solution, at 20 percent of all households, is the selling or pawning of assets. More than 70 percent of households experience one or two instances of cash-flow problems. Cash-flow

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of debt burden on various socio-economic characteristics and regional dummies do not support this contention as the regional dummies are not significant.

problems and degree of debt burden perception are shown in Figure 4.13 to be correlated. Data on cash-flow problems and debt burden will be used in the final section of this part in modeling household stress under debt.

Figure 4.11 Cash Flow Problem

Source: HADS Survey

Figure 4.12 Number of Cash-Flow Problems Household Encountered During a Year

Source: HADS Survey

Figure 4.13 Number of cash-flow problems household encountered during a year (by debt burden group)

Source: HADS Survey
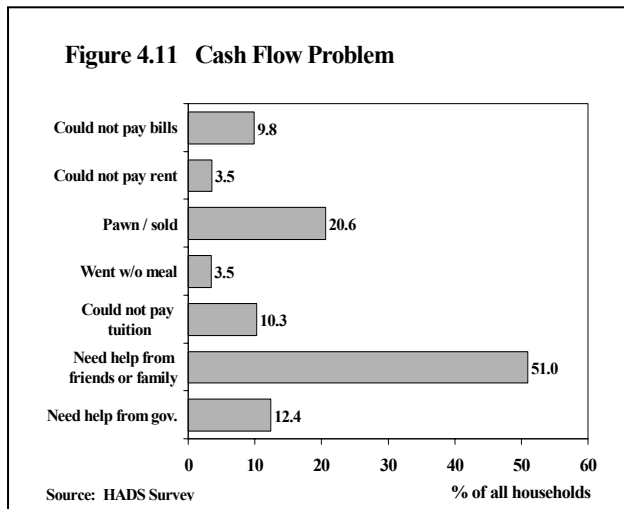
(iii) Which households are exposed to cyclical and non-cyclical risks?

The results on debt burden perception presented above suggest that households subject to income stability have higher debt burden. In this section we specifically identify groups facing high risks of income fluctuations arising from cyclical fluctuations. An analysis of the Thai economy's cycles reveals the real interest rate and the unemployment rate to be below trend. Mortgage debtors and low skilled employees are therefore potentially exposed to downside risks, especially if they did not carefully factored in these cyclical risks when they made consumption and borrowing decisions, resulting in excessive borrowing over the past few years. Farm income has been high of late and is shown to above trend. Farmers in the rice, rubber, and palm sectors are particularly at risk of a downwards cycle in crop prices. Property indices are also above trend and suggest risks to home owners, land owners and financial institutions.

Another risk factor is the unrealistic or over-optimistic views of future income and interest rate paths. Households could be lured into borrowing excessively to finance current consumption if they become overconfident about future income prospects. In case of home mortgage, households could decide to raise the mortgage amount to finance a bigger and more expensive homes based on the attractive mortgage package with low down payment and a low fixed interest rate during the first few years. As long as the decisions are based on reasonably realistic assumptions on future income and interest rate paths, the risk exposure from future shocks to these households are at least internalized in their decisions. However, if they based their decision without properly taking into consideration a more conservative prospects of their future income, they will be more vulnerable to income loss or rising interest rates in the future.

Figure 4.14   Macro Risk Exposure

Macro Risk	Macro Variable	Position relative to trend	Who has expose?
Interest rate Shock	Real MLR	Below	Mortgage Debtor Long term and floating rate
Income Shock	Unemployment rate	Below	Private sector worker (employee, worker)
	Farm Income	8% Above	Farmer
	Price of rice	18 % Above	Rice farmer
	Price of rubber	29% Above	Rubber farmer
	Price of palm	36% Above	Palm farmer
Wealth Shock	P/E Ratio	Below	High-income group

	Property Price Index
	  - Land + Townhouse
	  - Land + Single-Detached House
		
		Above
		Above
			Home owner, Fin. Institution
			High and middle income groups

Source: calculated by authors

Two groups of households that perhaps are potentially more susceptible to over optimism in income prospects is the farmer and laborer in the agricultural sector. A deeper look at the agricultural sector indicates a dissonance between cyclical trends and farmers' expectations. Over the past few years, farm income has risen markedly as a result of favorable price trends in major crops. In 2002, farm income has grown considerably. Given recent favorable income growth and assurances from the government, these farmers may have increased their borrowing. The figure 4.15 on farm expectations reveals that a substantial portion of farmers in the rice, rubber, and sugarcane sectors expect prices to rise. These farmers may be particularly at risk of over-borrowing and debt stress if they have overly optimistic projections of their income path.

Figure 4.15 Farmer's Expectation on Future Price of Their Main Crops

Percentage

Major Crops	Stable	Increase	Decrease	Unsure
Rice	11.5	45.8	5.5	37.2
Rubber	20.6	29.1	19.0	31.4
Sugarcane	22.6	36.5	2.0	38.8

Source: HADS Survey

(iv) Who have poor financial literacy?

One major determination of a household's ability to manage its debt burden is its financial literacy. Financial literacy, within the context of this paper, is defined as the understanding of the "pricing" of loans and the implications of loan default. Adequate financial literacy is essential if households are to maintain feasible debt burdens. The HADS survey poses four questions on financial literacy in an attempt to measure households' financial literacy.

The first question asks for households' perceptions of interest rate trends in the coming 2-3 years. The second question asks if households can distinguish between monthly and yearly interest rates. The third question asks if households are aware that information on incidences of default at a certain bank will be shared with other banks. The fourth and hardest question asks for the household's calculation of the impact of a rise in interest rate from 5 to 10 percent on the interest payment of a floating-rate loan. Even though the survey was field in June and thus before the Aug 25 BOT policy rate increase, it is still reasonable to expect that average consumer would know about the imminent upward movement of interest rate cycle, given information available in the public domain. Therefore, the first question would require that households indicate an upward trend to be considered correct. The correct answer to the fourth question is 100 percent.

Figure 4.16 on household financial literacy displays findings from the survey. Most households correctly answered questions 2 and 3. However, most households answered questions 1 and 4 incorrectly.   Furthermore, of the households under mortgage loans and particularly exposed to interest rate rises, only 21 percent answered both questions 1 and 4 correctly. Figure 4.17 depicts the financial literacy index which is the share of financial literacy questions correctly answered. Plotting the index by education and income indicates a positive correlation as expected. Variation across regions is minimal with a peak in the Bangkok region. Financial literacy is somewhat declining in age and may reflect differences across cohorts rather than age *per se*.   Nevertheless, we can infer that pockets of the population in the low income and education brackets exhibit low financial literacy and are particularly exposed to shocks amplified by debt.

Figure 4.16   Households' Financial Literacy

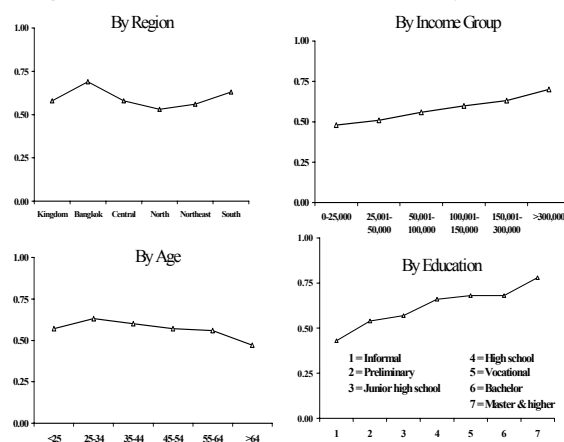| Financial Literacy	Right (%)	Wrong (%)
1. Interest Rate Prospect	38.1	61.9
2. The difference of interest rate per month vs per year	80.4	19.6
3. Credit Bureau Existence	76.1	23.9
4. Impact from interest rate change towards debt service burden	39.2	60.8

Among Those with Mortgage Loan

Financial Literacy in 1 & 4	Right (%)	Wrong (%)
1. Interest Rate Prospect	43.2	56.8
4. Impact from interest rate change towards debt service burden	42.6	57.4

Both wrong 35%   Both right 21%   Only one right 45%
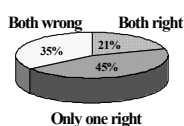
Source: HADS Survey

Figure 4.17 : Households' Financial Literacy Index

By Region

By Income Group

By Age

By Education

1 = Informal   4 = High school
2 = Preliminary   5 = Vocational
3 = Junior high school   6 = Bachelor
7 = Master & higher

Source: HADS Survey

4d   A model of household financial stress: estimation and shock simulation

Borrowing can be a useful tool for a household desiring to reallocate consumption across time. However, borrowing also entails risks. It adds to the sum of the household's committed payments each period and therefore reduces the household's flow of discretionary income that can be used to deal with adverse shocks such as unemployment or illnesses. Furthermore, the household may not foresee the extent to which debt increases its exposure to various risks. Given a large enough shock, the burden of debt can sometimes become heavy and, in the extreme, insupportable if debt payments cut into the household's budget on necessities such as food and rent. Debt therefore amplifies the effect of shocks.

In this section we seek to examine the causes of household stress arising from burdensome debt loads. First, we discern the relationship between household stress, debt, income and various socioeconomic characteristics using the BOT survey on household debt. Second, using the estimated relationship, we predict incidents of household stress within the Socioeconomic Survey (NSO 2004 Q1) as a result of income and debt shocks.

We find that small pockets of the population are vulnerable to interest rate and income shocks and debt increases. Those with low education, low income, high debt-to-income ratios, a high share of floating-rate loans, and working as farm operators, non-farm laborers, or entrepreneurs are particularly vulnerable.

Explaining household stress within the BOT survey on household debt

We are interested in examining households under severe stress from heavy debt burdens using an empirical model. The model is constructed with the goal of answering the following questions: Which households are under severe stress? And what socioeconomic variables tend to predict stress? There is no theory of household stress *per se* around which to construct an empirical model. Nevertheless, household stress can be thought of as arising

from cash flow problems in which the household's expenditures on necessities and debt servicing exceed its inflow of cash and holdings of liquid assets.

In informing our empirical analysis of household stress we glean various variables of interest from economic theory and the household survey literature.[21] First, we define households stress as one or more incidents of cash flow problems. A cash flow problem means a lack of funds to cover necessary expenditures such as food, housing, utilities and others.. Using an ordered logit model[22] we estimate the relationship between household debt, income, other socio-economic characteristics and past exposure to shocks. We then obtain the conditions under which households are most likely to face stress. The models suggests that excessive household indebtedness is a multifaceted problem.

The BOT survey contains two questions that relates to households under stress from heavy debt burdens. The survey inquires whether the respondent's household had encountered a combination of cash flow problems within the past year.[23] The survey also inquires whether the household's debt burden is heavy. Using these two pieces of information, we construct an ordering variable that serves as measure of household debt stress. The variable takes on the integer values 0 to 2. A value of 2 means that the household reported having a heavy debt burden and more than 2 cash-flow problems within the last year. A value of 1 is similar but for cash-flow problems numbering from 1 to 2. All indebted other households obtain the value of zero. The variable in question is an ordering. That is, a value of 2 implies more stress than a value of 1, and 0. Like letter grades, it does not imply that a value of 2 is twice as stressful than a value of one. The tables below show the percentage of households experiencing stress and associated debt-income ratios. There is a correlation between household stress and the debt-to-income ratio and suggests that higher debt-income ratios tend to cause more stress.

Table 4.1 Households Under Stress

Household Stress Level	Weighted Percentage
0	78.23
1	15.83
2	5.94

Source: BOT HADS Survey (2004)

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[21] For an excellent overview of the field, see Angus Deaton (2000) The Analysis of Household Surveys (John Hopkins University Press: Baltimore)

[22] A logit model is often used when the dependent variable is a dummy variable that takes on the value 0 or 1. An ordered logit model is an extension of the logit model. However, in the ordered logit model, the dependent variable is an ordering of various outcomes. The ordering indicates the ordering of preferred outcomes. Examples include bond ratings and letter grades.

[23]Please see variables B48-B54 of the BOT HADS survey. Possible choices include the following: 1) late payment on water, electricity, or telephone bills, 2) late rent payment, 3) sale of assets 4) cutting down on meals 5) late education expenditures 6) requesting help from relatives or friends and 7) requesting help from governmental or welfare agencies.

Table 4.2 Household Stress and Debt to Income Ratios

Household Stress Level	Median Debt to Income	Mean Debt to Income
0	0.64	1.60
1	1.49	2.82
2	1.60	3.59

Source: BOT HADS Survey (2004)

Table 4.3 Estimation of Ordered Logit Equation of Household Stress
Implied probabilities at sample means

Variable	Coefficient	Sample Mean	Base Unit	Marginal Effect on P (Y=0)	Marginal Effect on P (Y=1)
Ln Debt/Income	0.09***	-0.24		-0.02	0.01
Ln Debt Service	0.18**	10.41		-0.03	0.03
Ln Debt	0.26***	11.25		-0.05	0.04
Ln Income	-0.51***	11.47		0.10	-0.07
Age, primary earner	-0.02*	44.38		0	0
Primary	-0.81*	0.59	No education	0.16	-0.12
Secondary	-1.09*	0.23	"	0.18	-0.14
Certification	-1.62**	0.05	"	0.20	-0.16
Bachelor or higher	-1.73**	0.10	"	0.22	-0.18
Education unknown	-1.53	0.01	"	0.19	-0.15
Farm operator	-1.61**	0.36	Unemployed	0.27	-0.21
Farm labor	-2.58**	0.02	"	0.24	-0.19
Employer	-2.28**	0.07	"	0.25	-0.20
Entrepreneur	-1.64**	0.19	"	0.24	-0.19
Labor / Short-term	-1.43**	0.14	"	0.21	-0.16
Government	-1.38**	0.09	"	0.19	-0.15
Office employee	-1.38**	0.11	"	0.19	-0.15
Retired	-1.23*	0.01	"	0.17	-0.16
Home mortgage	0.38**	0.08	Home owner	-0.08	0.06
Home rental	-0.04	0.10	"	0.01	-0.06
Home stay	0.15	0.07	"	-0.03	0.06
Home other	0.07	0.00	"	0.01	0.01
Household size	0.08*	4.22		-0.02	0.02
Central	-0.17	0.20	Bangkok	0.03	-0.03
North	-0.56**	0.22	"	0.10	-0.08
Northeast	-0.23	0.37	"	0.04	-0.03
South	-0.32**	0.13	"	0.06	-0.04
Dependency ratio	0.59**	0.42		-0.11	0.09
Financial Lit. (4)	-0.26**	0.38	Literacy low	0.05	-0.04
Informal (r=0%)	0.89**	0.04	No informal (r=0)	-0.20	0.14
Informal (r>0%)	1.18**	0.25	No informal (r>0)	-0.25	0.18
Income shock	0.64***	0.29	ΔIncome ≥ 0	-0.13	0.10
Financial access up	-0.25**	0.57	ΔAccess ≤ 0	0.05	-0.04
Debt interest up	0.40**	0.18	ΔInterest ≤ 0	-0.08	0.06

Number of observations = 1,785; Number of Jangwat = 14
Number of primary sampling units = 280; Population size = 10,295,255; Psuedo R^2 =0.15

Note: ***, ** and * denote 1, 5, and 10% significance levels, with heteroskedasticity-robust standard errors. Outliers with undue influence were removed.

The results of the ordered logit estimation, based on the BOT HADS 2004 survey and its associated survey sampling weights, with adjustments made for cluster sampling are presented above. The model's R-squared term or goodness of fit is admittedly small. This is expected given that the model is a logit estimation of cross-sectional data. In such a case, we do not expect the model to explain all our observed outcomes. We stress that low R-square is therefore not necessarily an impediment to our analysis. What is important, however, is that the model reveals to us the relationships between household stress and our variables of interest. The nature of the said relationships is reflected in the size, sign, and significance of the estimated coefficients of each variable. A positive sign indicates that the variable in question, at the very least, is correlated with positive stress. At the very most, a positive sign indicates a causal relationship in which the said variable increases the likelihood of household stress. A correctly specified model will therefore allow us to examine the marginal effect of a change in variable, holding all else constant. The significance of many of the explanatory variables suggests that an understanding of household stress under debt will require a multifaceted approach. The table reports the marginal effects or partial derivatives of the probability P of outcome j occurring with respect to a certain characteristic X_k, $\partial P(y=j)/\partial X_k$, in the last column, evaluated at the sample means.

We find that household stress is increasing in the debt-to-income ratio as expected since the level of the household's debt service and remaining duration of the loan is related to the outstanding loan amount. However, household stress is also decreasing in the household's cash income level. Households that enjoy high income levels, even though they may share the same debt to income ratios as low income households, will tend to be less stressed. This is not surprising given the fact that high income households tend to have more assets than low income households. High debt service also contributes to stress. The debt service variable is correlated with debt but does not pose a problem for the model as coefficients are still significant.

The educational attainment of the household's highest income earner is correlated with less stress. Higher levels of educational attainment result in smaller likelihood of stress. Financial literacy is shown to be important and largely not substitutable by formal education, although both are correlated.[24] Respondents who answered incorrectly to the BOT survey question on the impact of an interest rate hike on interest service were more likely to be stressed.[25] Households who answered this question incorrectly tended to underestimate the true cost of an interest rate hike. These households would therefore be vulnerable to shocks from *foreseen* interest rate hikes let alone unforeseen changes. The coefficients on the usage of informal debt suggests that high interest rates can cause stress. Consider the size of the coefficient on the usage of informal debt with a zero interest rate as opposed to the coefficient on the usage of informal debt with a positive interest rate. The larger coefficient on the latter variable indicates that high interest rates are associated with stress.

A household with a home mortgage tends to be more stressed compared to a household in complete ownership of its home. Households paying rent, however, did not show a tendency to be stressed. It is noteworthy that for household to attain the security of home ownership, it must take the risky path of drawing on a home mortgage. The risks of a home mortgage relate to the fact that home mortgage loans become floating loans after three years. A large rise in interest rates can potentially result in a substantial rise in mortgage

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[24] Omitting education variables from the regression only marginally increases the effect of financial literacy.
[25] The question of interest (Q. E05, BOT Survey on Debt Attitude) asks the following: "If Mr. Smith has interest-bearing debt and the debt interest rate rises from 5 to 10 percent, by how much more will his *interest service* increase?" The correct answer is 100 percent. Our regression result still holds if we limit our estimation sample to cases where our respondent is the highest income earner or the spouse of the highest income earner.

payments. Furthermore, to qualify for home mortgage, a household must submit a sizeable down payment and submit the home as collateral. A home mortgage will therefore leave the household with diminished flexibility in coping with unanticipated shocks.

Increasing household size and the dependency ratio tend to be correlated with increasing stress and may indicate the difficulty that households have in managing finances when its members are numerous or not working.

It is noteworthy that some of the regional dummies are significant in relation to the Bangkok province. The northern and southern dummies are significant and negative indicating that being a household residing in the northern or southern region will tend to decrease the probability of stress compared to Bangkok resident households *holding all else constant*. However, since all else is not constant, one cannot conclude that northerners and southerners are better off than Bangkokians. Nevertheless, the significance of the regional dummies warrants a deeper look into indebtedness at the regional level.[26]

Simulation of economic shocks

The steady rise in household debt over the past few years and unavoidable business cycles both at home and abroad begs an unavoidable question: how vulnerable are Thai households to future adverse shocks? In this section we propose a simplified econometric model of household stress which we subject to interest and income shocks and debt increases. We analyze the resulting increase in the number of stressed households and ask which socio-economic group will tend to bear the brunt of the impact. Furthermore, we simulate the sensitivity of household interest debt service to changes in interest rates.

Simulating household stress under interest rate shocks

Will incidents of household stress increase following an interest rate hike? By simulating interest shocks within the framework of the ordered logit model of household stress presented above we find that on overall, households are resilient to interest rate shocks. Using the ordered logit model of household stress above, we assume that a rise in the interest rate *r* will result in each household's debt service, defined within this section as including both interest and principal payment, rising from its current level δ^t to its new level δ^{t+1} by the change in the interest rate times the amount of floating loans outstanding, d_f^t , thus:

$$\delta^{t+1} = \delta^t + \Delta r^{t+1} d_f^t$$

We assume that the interest rate facing households rises by the same amount across all households and for all types of floating-rate loans.[27] However, due to lack data on financial assets, we omit changes in return on assets. Given the high concentration of assets among very high income groups, we believe this is an acceptable omission since the cost would be a positive bias in the effect of an interest rate hike on very high income groups. The results, presented in the table below, indicate that most households, let along extremely high income

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[26] For a deeper discussion of household debt at the regional levels, please see forthcoming papers on household debt from the Bank of Thailand regional offices.

[27] We assume that the interest rate facing households rises by the same amount across all households and for all types of floating-rate loans. Extrapolating from NSO SES data, mortgage loans are assumed to be floating loans if the household's primary income earner is aged 40 or above. Education and hire-purchase loans are fixed-rate loans.

households, will not experience severe stress as a result of the said shock. Following a 1 percent hike, the share of households under a stress level of zero falls by 0.60 percent. A 2 or 3 percent hike sees the same share falling by 0.61 percent. The marginal effect of a 2 or 3 percent hike relative to 1 percent hike is small in regards to the group under the least stress. However, the 2 and 3 percent hike will see more households being pushed to the highest stress category. This is not to say that households will generally not be affected at all by interest rates. Households will indeed be affected in that they will have to adjust their consumption plans. However, the degree to which households are severely affected to the point of incurring cash flow problems is not currently cause for alarm.

Who are the one percent of households that is indeed affected? Of the affected group, farm operators, laborers, and entrepreneurs (with no employees) are disproportionately represented. These affected households are characterized by below median income, high median and mean debt-to-income ratios of 3 and 5 respectively, and low education: a majority of 70% have primary education, 24% have secondary education. Furthermore, they are exposed to loans that are predominantly floating-rate in the form of investment and mortgage loans.

Table 4.4   Increases in Household Stress from Interest Rate Shocks

Stress Level	1%	2%	3%
0	-0.60%	-0.61%	-0.61%
1	0.54%	0.64%	0.68%
2	0.01%	0.11%	0.16%

Source: BOT HADS survey (2004) and authors' estimation

Figure 4.18
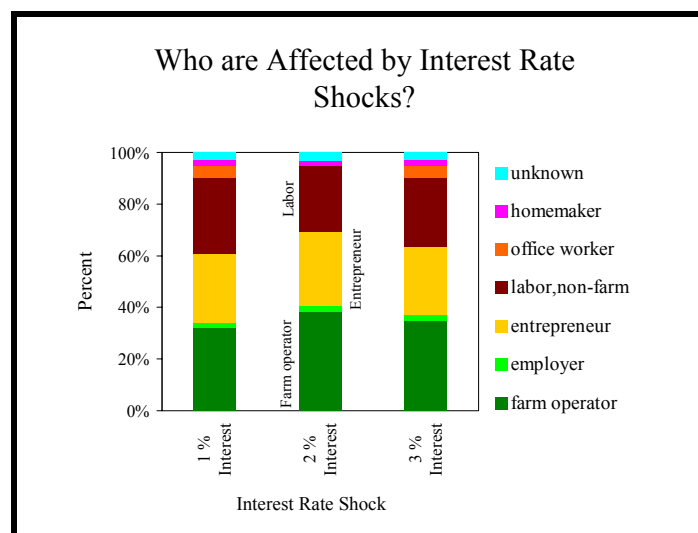
A simplified model of household stress

42

We present a simplified ordered logit model of household stress using the BOT survey on household debt and attitudes for the purpose of performing out-of-sample predictions within the NSO SES survey. We simplify the model so as to obtain a model based on variables that are available in both the BOT survey and the NSO's 2004 Q1 socio-economic survey. We therefore omit variables related to changes in income, interest rates, financial access, and informal debt status categorized by zero interest and positive interest. This simplification will allow us to obtain a model of household stress with which to perform out-of-sample predictions using the socio-economic survey (NSO 2004 Q1), arguably the most representative data set of Thai households.

The results of the simplified model are consistent with the full-fledged model presented above. However, in the simplified model, the informal dummy takes on the value of 1 if the household is borrowing from at least one informal source.

Table 4.5 Estimation of Simplified Ordered Logit Equation Model of Household Stress
(Implied probabilities at sample means)

Variable	Coefficient	Sample Mean	Base Unit	Marginal Effect on P (Y=0)	Marginal Effect on P (Y=1)
Ln Debt/Income	0.44***	-0.22		-0.02	0.01
Ln Income	-0.20**	11.51		0.10	-0.07
Age, primary earner	-0.015*	44.10		0	0
Primary	-0.79	0.57	No education	0.16	-0.12
Secondary	-1.06*	0.24	"	0.18	-0.14
Certification	-1.36**	0.06	"	0.2	-0.16
Bachelor or higher	-1.56**	0.11	"	0.22	-0.18
Education unknown	-1.33	0.01	"	0.19	-0.15
Farm operator	-1.27**	0.33	Unemployed	0.27	-0.21
Farm labor	-1.82**	0.02	"	0.24	-0.19
Employer	-1.86**	0.08	"	0.25	-0.20
Entrepreneur	-1.18**	0.20	"	0.24	-0.19
Labor / Short-term	-0.90**	0.14	"	0.21	-0.16
Government	-1.01**	0.09	"	0.19	-0.15
Office employee	-0.97**	0.11	"	0.19	-0.15
Retired	-0.99*	0.01	"	0.20	-0.16
Home mortgage	0.45**	0.09	Home owner	0.09	-0.07
Home rental	0.07	0.11	"	0.17	-0.13
Home stay	0.16	0.07	"	-0.08	0.06
Home other	-0.08	0.00	"	0.01	-0.01
Household size	0.13*	4.22		-0.03	0.02
Central	-0.15	0.19	Bangkok	-0.01	0.01
North	-0.53**	0.23	"	-0.02	0.01
Northeast	-0.26	0.30	"	0.03	-0.03
South	-0.45**	0.19	"	0.10	-0.08

Number of observations = 1945; Number of Jangwat = 14
Number of primary sampling units = 280; Population size = 11,203,126; Psuedo R^2 =0.13

Note: ***, ** and * denote 1, 5, and 10% significance levels, with heteroskedasticity-robust standard errors

Stress test of households under income shocks and debt changes

Using the simplified model, we predict the impact of debt changes and income shock on household stress using the NSO SES survey (2004 Q1). The following table presents the marginal effects under scenarios of 10, 20, and 30 percent decreases in income and 10, 20, and 30 percent increase in debt.

<table>
<tr><td colspan="4">**Table 4.6 Increases in Household Stress from Income Shocks**</td><td colspan="4">**Table 4.7 Increases in Household Stress from Debt Increases**</td></tr>
<tr><td>**Stress Level**</td><td>**-10%**</td><td>**-20%**</td><td>**-30%**</td><td>**Stress Level**</td><td>**10%**</td><td>**20%**</td><td>**30%**</td></tr>
<tr><td>0</td><td>-1%</td><td>-2%</td><td>-4%</td><td>0</td><td>-1%</td><td>-2%</td><td>-2%</td></tr>
<tr><td>1</td><td>10%</td><td>16%</td><td>35%</td><td>1</td><td>6%</td><td>11%</td><td>13%</td></tr>
<tr><td>2</td><td>12%</td><td>35%</td><td>50%</td><td>2</td><td>9%</td><td>15%</td><td>28%</td></tr>
<tr><td colspan="4">Source: BOT HADS survey (2004), NSO, and authors' estimation</td><td colspan="4">Source: BOT HADS survey (2004), NSO, and authors' estimation</td></tr>
</table>

On overall, households at the lowest stress level are mostly resilient to income shocks and debt increases. The results indicate that income shocks are generally more potent. Furthermore, the marginal effects of income shocks are strong relative to the relatively muted marginal effects of debt increases.

Part 5   Implications of higher household indebtedness

In this section, we will discuss any implications of rising household indebtedness to the financial system stability and macroeconomic prospects. Admittedly, analyzing these implications would require extensive studies, including stress testing and simulation of the macroeconomic model with financial sector module, which is beyond the scope of this paper. Rather, we will outline some of the key implications of rising household debt, which should be taken into considerations by policy makers and market participants alike.

5a Implications on financial system stability

High growth rate of credits extended to the household sector over the past few years is unlikely to pose any serious problem to the financial stability. At present, there is no sign of quality deterioration of household credits the NPL rates for household loans are declining. Though remaining relatively high by international standard, all the NPL have been adequately provisioned. In addition, the capital adequacy ratio for commercial banks and finance companies remains solid with the BIS ratio being more than 14 percent. In term of household ability to service debt, our calculation of debt service burden shows that currently the average debt service is still relatively low by international standard. Moreover, for most commercial banks, the exposure to the household sector is not high, with all household loans accounting for around 30 percent of total outstanding loans. Equally important is the fact that most of the financial institutions has upgraded their risk management practices over the past few years with increased uses of credit scoring and information from credit bureaus. Lastly,

bulk of household credits are mortgage and hire purchase, which offer relatively good collateral values for financial institutions in case of loan defaults.

However, there are some unique risk factors that may put specialized financial institutions in a more vulnerable position relative to their private sector counterparts. Naturally, with majority of loans by GSB, GHB and BACC being extended to the household sector (more than 80 percent of total loan), it will be more exposed to any systematic shocks to the household balance sheets, which will reduce household's ability to service debt. But another risk that is equally important is the willingness to pay.

In the BOT survey, we have asked a hypothetical question, **'Supposed that you have borrowed from three sources of loans, 1) private owned financial institutions, 2) specialized financial institutions and 3) village funds. Now, if you could not avoid a default on your loans, in what order would you default your loans?**' The lower score would mean greater default risk. The table below shows the results.

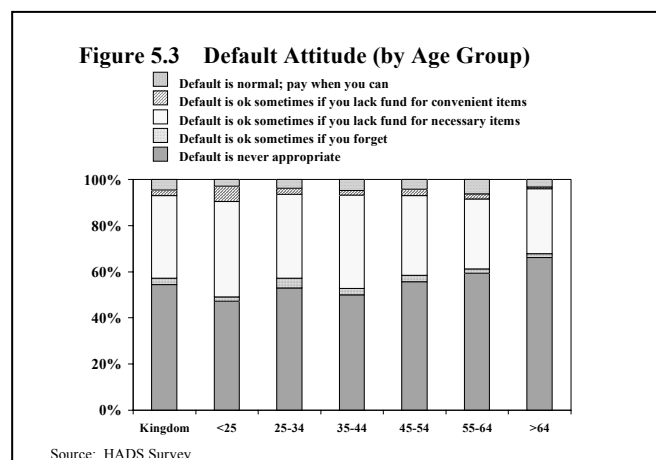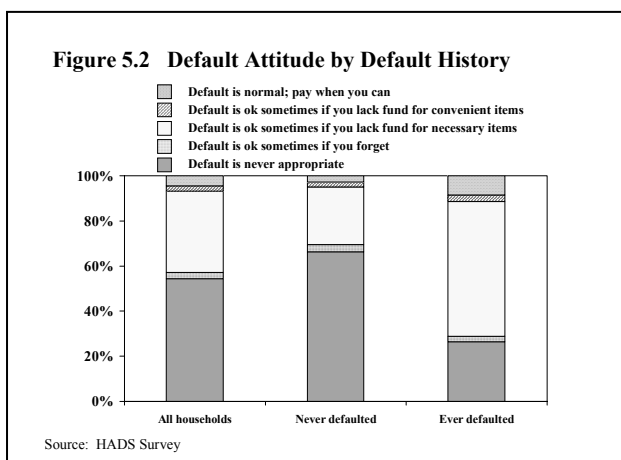| Table 5.1 Order of default			
Borrowers with at least one loan from	*Average Ranking of Default*		
	SFI	*Private FI*	*Village Fund*
Village Funds	1.74	2.09	1.87
Private FI	1.70	2.16	1.86
SFI	1.74	2.14	1.88
SFI + Private FI	1.82	2.18	1.84
SFI + Village Fund	1.75	2.11	1.93
Private FI + Village Fund	1.83	2.11	1.81
SFI + Private FI + Village Fund	1.85	2.11	1.84
All Borrowers	1.72	2.11	1.86
non-Borrowers	1.64	1.97	1.80
All households	1.70	2.07	1.84

Source: HADS Survey

On an average basis, more households choose to default SFI first, followed by village funds and then private FI. The relative standings of average order of default are quite stable across groups of households. As the result indicates, SFI may face greater default risk relative to village fund and its private counterparts. Admittedly, this is a statement of relativity, not absolutism. It only indicates that SFI have more risk in relative term, but the overall default risk needs not be high. Moreover, this is not a statement about the effectiveness of SFI. SFI may have been established with the goal of providing financial access to particular groups of households. Indeed, some of the households served by SFI are among the low income group and may have difficulty in accessing other formal financing. There are also instances where SFI may be more lenient towards their customers. The example of BAAC's farmer's debt suspension program comes to mind. It is possible that when considering the overall welfare of society, the way that SFI has been operating may be optimal. Nevertheless, it is important that the authorities are aware of this risk and try to minimize to the extent that is possible.

Another potential risk to the stability of financial system as well as implications on public contingent liability is the issue of moral hazard with related to household borrowing.

In the BOT survey, we ask **whether households expect government assistance if they ever face a debt payment problem.** Of all households, 37% said "yes", 23.9 "no" and 38.1 "unsure". The share of households expecting government assistance increases with low education and farmer groups. When divided into groups by source of funding, we found that greater share of SFI borrowers indicate that they expect government assistance. This further underscores the extra risk SFI may have to face with.

Figure 5.1 Expectation of Government Assistance on Household Debt Payment Problem

By Source of Loan

Source: HADS Survey
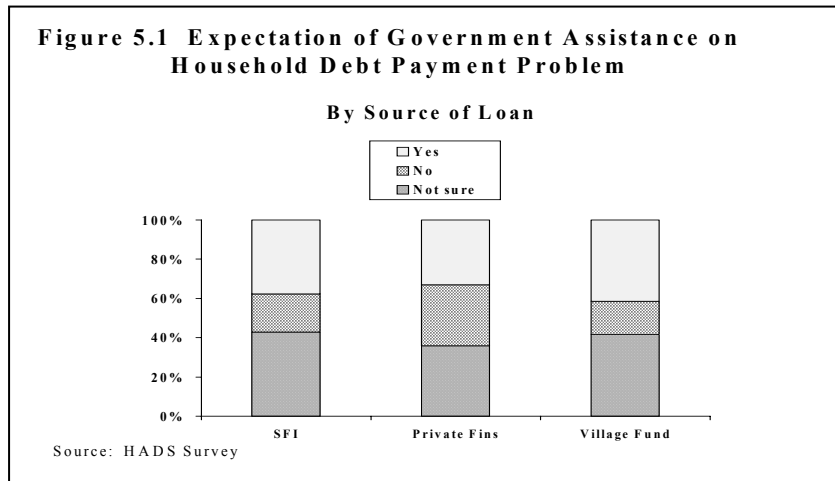
Lastly, we ask question on household attitude towards default. The choices are ranging from 1) default is normal; pay when you can, to 3) can default some time if there is insufficient fund for necessary expenditure, to 5) never appropriate in any circumstances. Among those who have defaulted at least once in the past, smaller percentage of these households answers that default is never appropriate, compared to those who have never defaulted. This evidence supports that stance that individual attitude is correlated with his or her action. Thus, casual or more forgiving attitude toward default is correlated to past default and perhaps could serve as signal for greater potential for future default. Moreover, default attitude seems to vary with age, with younger households indicate more casual attitude toward default compared to the older households. This raises additional question whether the different in default attitude is accounted by the cohort or age factors. The former factor, if proved to be more relevant, will pose additional risk in the future to the financial sector stability.

Figure 5.2 Default Attitude by Default History

Source: HADS Survey

Figure 5.3 Default Attitude (by Age Group)

Source: HADS Survey

5b Implications of increased household indebtedness on macroeconomy

We have argued that, in case of Thailand, there are no clear signs that Thai households have become overleveraged, as the average indebtedness is still below the numbers found in other countries. In any case, regardless of whether households have borrowed excessively or not, increased household indebtedness has a number of important macroeconomic implications for Thailand, which we shall briefly discussed here.

1) The higher debt-to-income ratios implies that Thai household's consumption will become more sensitive to future changes in interest rates, income and asset prices. As household's indebtedness increases, its debt service will rise, resulting in lower free income. Recall from earlier section, we define free income as total household income less necessary and pre-committed expenditures (such as debt services). If households were to experience shocks, say, rising interest rates, it would have to pay more to service debt and thus have smaller amount of income to consume other goods, compared to the case where they were debt-free.

In case of Thailand, those with mortgage loans will be vulnerable to rising interest rates as most mortgages are variable rate loans. The risks will be especially great if households were drawn to the low borrowing rate and increase the size of the mortgage excessively without properly taking into account the likely increase in interest rates and debt services that may follow.

2) The distribution of debt matters in determining the impacts of higher level of debt on the economy. For example, unemployment is more likely to happen to newer entrants into the labor force or lower income earners. If these groups happen to have high debt burden, then there is a likely chance for them to become unemployed and face severe financial stress in the future. Another example has to do with rising interest rate and the different impacts it has on net borrowers and net lenders. As we have seen, for net borrowers, the impact will be lower consumption. However, for net lenders, increase in interest rate will boost the return on their wealth. The aggregate impact will then depend critically on the distribution of debt and assets across the household sector as well as the different marginal propensity to consume across household groups.

We also have seen from earlier sections that low-income households have relatively high debt burden. This fact would also raise the sensitivity of the economy to interest rate changes. Low income groups are more likely to be vulnerable to changes in interest rates because they are less likely to have other resources to smooth their consumption. In addition, although low-income groups may have lower nominal levels of consumption than high-income groups, the higher marginal propensity to consume among the low-income groups mean their impact to the economy is still important. The impact also could be relevant in terms of changes in consumption patterns with low-income groups accounting relatively more on necessary items such as food.
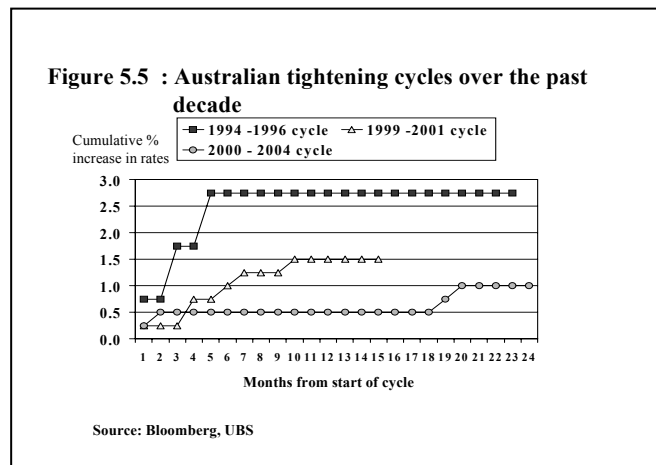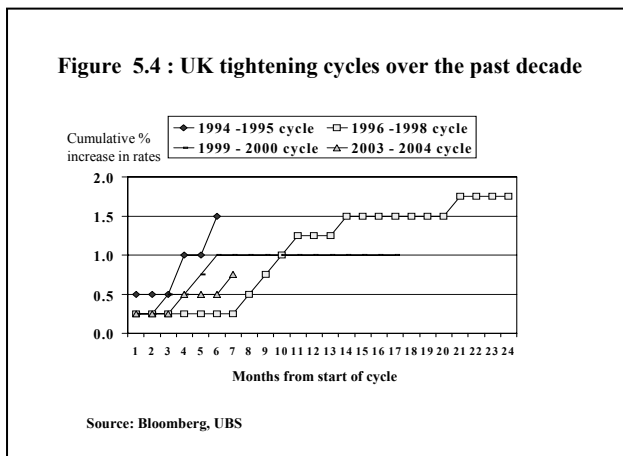
3) Monetary policy will become more potent due to increased sensitivity of the household sector to interest rate changes.

The effect of monetary policy can be divided into two clear channels of transmissions. The first is the traditional interest channel. As interest rates rise, the cost of borrowing and the opportunity cost of saving both increase, leading to slower pace of new borrowing, and

moderating the economic growth. The impact of this price channel has relatively become less relevant to corporate sector as most companies have relied on retained earnings to finance investment rather than borrowed funds. Although consumers will still respond to the interest rate channel, the impact can often be dominated by other factors like labor market conditions. Instead, the factor that could make the Thai economy more rate-sensitive today is the second channel of monetary mechanism—the credit channel.

The credit channel concerns not so much new borrowing *per se*, but rather the impact of higher interest rates on existing borrowing, and on the future willingness of lenders to provide credit. With household balance sheets become more leveraged, any increase in borrowing rates will result in higher debt services and less free income for households. The credit channel does not just work through its impact on real disposable income net of interest payments, but also through lending attitudes. In a rising interest rate environment, lenders may seek to restrict their lending by tightening credit standards for higher risk borrowers out of a concern for their ability to pay rising debt services. The provision of credit can be highly relevant to the consumption of groups that are generally credit-constrained.

With greater sensitivity of the economy to the interest rate, there is greater uncertainty on how the monetary authorities should apply the pace and extent of monetary policy tightening. If the central bank believes that the structural changes in the provision of credit place additional emphasis on the credit channel, they are likely to be more circumspect increasing interest rates. This does not preclude them from increasing interest rates, but it may imply that it may change their reaction functions. With consumers are more likely to respond to any rate rises in terms of lower spending compared to previous cycles, the monetary authorities may reconsider their "neutral" stance by setting the policy rate at a level below where conventional belief would consider "neutral" to be. And, it is likely that the central banks will be more "measured" in their tightening in order to assess the impact of the monetary policy. Thus, it may imply that interest rate cycles may have a smaller amplitude than in the past in response to a similar set of shocks.

Figure 5.4 : UK tightening cycles over the past decade

Source: Bloomberg, UBS

Figure 5.5 : Australian tightening cycles over the past decade

Source: Bloomberg, UBS

The examples of Australia and UK highlight how the central banks have adjusted to the greater sensitivity to interest rates. Both economies experienced higher household indebtedness over the past decade. In Australia, the current tightening cycle has been marked by more shallow nature of interest rate increases, and by longer duration of the overall cycle. Similar pattern also could be seen in the current tightening cycle for UK. Certainly, there are many other factors behind the moderate and deliberate policy approach from these two

central banks, but the increase in interest rate sensitivity on the part of the consumers in these two economies surely has played an important part in their policy considerations.

Household's saving rate

The recent rise in household debt has been coincided with a declining trend in household's saving rate. According to latest NESDB data, the saving rate stood at 5.96 % of household income in 2002, the lowest rate ever. Given the acceleration in household liabilities together with lower saving rate, many observers have wondered if we should begin to worry about these trends.

Figure 5.6 Household Saving Rate

Household Saving (as % of income)

Source: NESDB
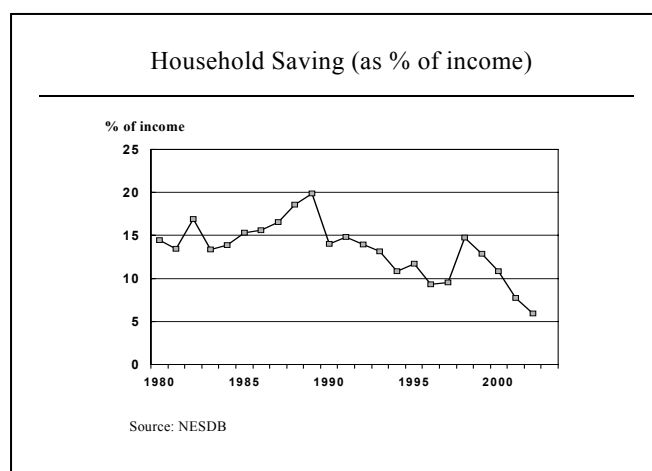
Although a thorough analysis of reasons and implications of declining household saving is beyond the scope of this paper, we can provide a possible list of factors that may have contributed to lower saving rate as well as links to household debt developments. First, based on the SNA (System of National Accounting), any household spending on durables such as car, motorcycles or other appliances will be counted as consumption, and thus will be automatically subtracted from household income, leading to lower saving rate. Since the past few years have witnessed a strong surge in durable consumption financed in a large part by borrowing, falling saving rate should not come as a surprise.

Second, favorable cyclical factors such as low unemployment rates or favorable income growth over the past few years could have raised household confidence in future job and income prospects, resulting in greater propensity to consume and lower saving rate. Figure 5.7 seems to suggest that Thailand's saving ratio and unemployment rate are highly correlated, implying that households may tend to save more as a percentage of income when there was uneasiness with regards to job prospects. Similarly, one could argue that the level of saving has fallen back because the level of income volatility has reduced steadily following the 1997 crisis. Figures 5.8 plots the saving rate against a measure of income volatility, defined as the standard deviation of the growth in real income growth over a rolling five-year period. The figure seems to loosely support the stated argument that saving rate generally varies with income volatility.

Figure 5.7 Household Saving Rate and Unemployment

Figure 5.8 Household Saving Rate and Real Income Volatility
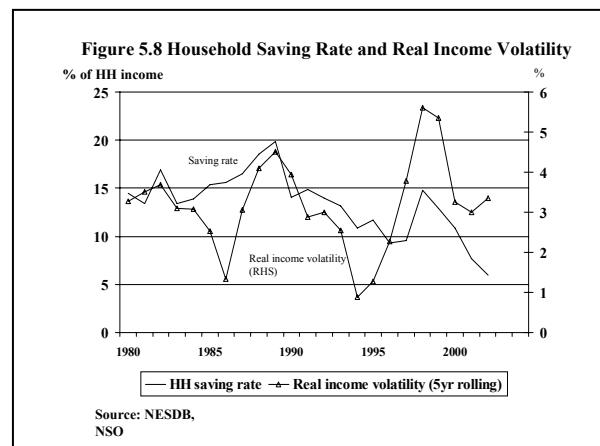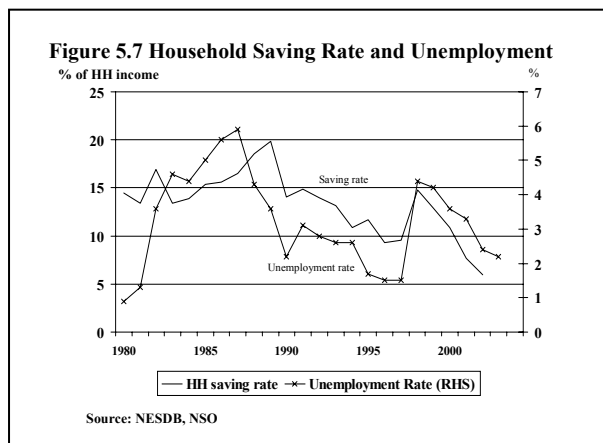
Third, a decline in saving rate may simply reflect general structural shifts in economic environment which prompted households to lower amount of saving for precautionary purposes. For example, greater financial access helps ease households' liquidity constraint, allowing them to borrow in the event of cash flow problem. Other possible contributing factors include improved social insurance programs such as social security payment or health care guarantee, causing households to adjust downward their precautionary saving accordingly.

Despite plausible economic explanations stated above, a sustained decline in household's saving rate would have important implications on the health of household's financial position in the long run as well as on macroeconomic stability. On the former, the information from the BOT's HADS survey provides some worrying trends. When asked whether their current saving behavior, if maintained, would accumulate adequate saving for use during emergency or retirement, 54.8 % of households reply negatively, while only 27.9 % reply positively, with 17.3 % being unsure. The problem of household saving inadequacy is particularly pronounced among households with low income, low education, northeastern residence, and temporary workers or own-account farmers as main income earners.

As for the implications on macroeconomic stability, at present, there still remains quite substantial excess liquidity in the banking sector. Thus, it may seem that low household saving rate may not be a problem for funding investment. However, with the anticipated financing need for government's mega projects and continued expansion of private sector investment, the excess liquidity could potentially be absorbed over the next few years. Low level of household saving, if continued without any offsetting increases in saving by corporate or public sectors, could render the Thai economy become more dependent on external financing. Though using current account deficit to finance domestic saving investment gap needs not be a problem by itself as long as funding are used to invest in high-quality projects to ensure adequate rates of return, rising dependence on external debt could add vulnerabilities to the overall macroeconomic stability in the medium run.

Part 6   Policy implications and recommendations

This paper proposes five policy recommendations concerning monetary policy: prudential policy, market institutions, financial literacy, education, and data collection on the balance sheets of households.

First, in terms of **monetary policy**, careful consideration must be taken to minimize the risks of excessive household debt accumulation arising from an unusually long period of low interest rates. At the same time, the central bank will have to take into account the increased potency of monetary policy when setting the policy rate, as a result of the increased sensitivity of household consumption and debt servicing capability to interest rate change. The increased sensitivity of households to interest rates arises from the fact that approximately two-thirds of Thai households are in debt. Of this number, many hold floating-rate loans. As of 2004, approximately 22 percent of aggregate households are accounted for by personal loans. Investment loans accounts for 33 percent. Mortgage loans account for approximately 35 percent. Personal and investment loans are floating loans and their debt service payments adjust accordingly to prevailing interest rates. Mortgage loans, however, are a hybrid of float and fixed loans.[28]

As interest rates rise, so will households' monthly payments on floating rate loans and some hybrid loans. Household income available for consumption will fall. Consumption will thus become more sensitive to interest rate changes. It is noteworthy that the increased potency of monetary policy is double-edged: it increases the effectiveness of monetary policy but at the same time, policy-makers will have to be careful not to underestimate its effects.

Second, in terms of **prudential** policy, measures should be implemented in order to strengthen the effectiveness of overall supervisory framework, including moving towards consolidated supervision to ensure that all providers of consumer credit services are being supervised under the same set of highly prudential standard. We stress that these measures should not preclude the expansion of credit where credit is needed. Credit can help households to attain more desirable stable consumption paths. The BOT HADS survey shows that increased access to credit tends to lessen the chances of household stress. A reliance on informal debt tends to be correlated with household stress. This correlation may arise from causality in both directions. Stressed households may tend to resort to quick loans available from informal sources. In addition, the high interest rates of informal loans may in turn cause household stress.   In both instances, households do stand to gain from increasing access to formal funds. However, a comprehensive prudential framework must be in place to provide a level playing field and minimize market distortions so that household debt can grow in a balanced and orderly manner.

Third, markets work best when **information** is readily available and the **institutions** underpinning market transactions are strong and transparent. This is especially true of consumer credit markets as opposed to goods market. Credit markets in general tend to suffer from a scarcity of information on consumer credit history and a lack of understanding in regards to the rules governing dispute resolution.

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[28] At present, mortgage loans are fixed-rate loans for three years. Following the first three years, mortgage loans may rise depending on prevailing rates. We extrapolate from NSO data that 71 percent of mortgage loans are past the five-year mark.

In regards to the problem of information scarcity, public credit registries or credit bureaus can go a long way in facilitating the flow of information but credit bureaus as intermediaries of information can only do so much. For credit bureaus to truly work, the sharing of information between lenders must flow both ways. There must be both give and take on behalf of lenders in regards to information on consumers' credit histories. Both positive and negative information on each consumer's borrowing record must be reported. In such an environment, some lenders may lose their informational advantages but in the long run, the market as a whole will gain as borrowers will benefit from more competitive rates and greater access while lenders will benefit from diminished NPL rates. Such an environment must be actively fostered by governmental policy. On the household side, households must be made aware of the long term consequences of a decision to default given a properly-functioning credit bureau.

The BOT survey results suggest that households' understanding of the said consequences has room for improvement. Roughly 20 percent of households could not correctly answered that should one household default at a certain bank, others banks would be aware of the fact.[29]

Progress has been made on this front. The Credit Bureau Act became effective in March 2003 and two companies, the Central Credit Information Service (CCIS) and the Thai Credit Bureau (TCB), have been granted operating licenses. At present TCB covers more than 15 million consumers and corporate accounts while CCIS covers 14 million.[30] The credit bureaus' coverage has been steadily growing.

The continued rise in household debt has two implications for **legal infrastructure** policy: 1) readiness in resolving household NPLs and 2) enforcement of transparent rule-based resolution. First, although the current household debt situation is not an immediate cause for alarm, rising debt does increase the exposure of households to adverse shocks. As such, it is expected that the number of NPL could rise in the future given that not all households can escape adverse idiosyncratic shocks. The rise in the number of NPLs is not worrying in itself. However, the legal infrastructure must be prepared to handle and resolve the increasing numbers of NPL cases. In the face of an aggregate shock and a jump in the NPL rate, the capacity of the legal infrastructure will become of paramount importance in guaranteeing a rapid recovery. Second, legal institutions must provide and communicate clear rules for the orderly and transparent resolution of NPL court cases to both creditors and borrowers alike. Clarifying the legal rules of the game is a necessary, although not sufficient step, in ensuring that households and creditors face the right incentives in transacting with one another.

Fourth, promoting **education** and **financial literacy** can serve to significantly augment the stability of the household sector. Our findings on the causes of household stress indicate that education and financial literacy play important roles in determining the vulnerability of indebted households. Debt entails an understanding of how the household's stream of debt payments can vary across time according to maturity and the interest rate. A thorough understanding of the complexities of debt service calculations can sometimes be daunting, especially for first-time borrowers. A lack of understanding can result in households underestimating the cost of debt servicing under different interest rate scenarios.

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[29] However, many of the respondents that answered correctly seemed unsure as to the correctness of their answer.

[30] There is some overlap in coverage between the two credit bureaus.

In view of growing household debt levels and the spread of credit to new pockets of the population, households must be prepared to understand and correctly assess the implications of living with debt. This goal can be achieved by promoting educational attainment at the primary, secondary, and post-secondary levels. Financial literacy can be promoted through a concerted effort between monetary authorities and financial institutions.

Lastly, Thailand is in urgent need of a **national database** on the balance sheets and debt service of households. Such a database will enrich our understanding of the financial health of the household sector as debt grows. Although current household debt levels do not pose a risk to the macro-economy at large, expanding debt will potentially put certain groups of the population at risk in the future. A national database will allow policy-makers to fulfill their duty to foresee and prevent such risks

References

Ando, A and F Modigliani, 1963, "The Life-Cycle Hypothesis of Saving: Aggregate Implications and Tests", *American Economic Review vol. 53*, pp. 55–84.

Bank of Thailand, 2003, *Supervision Report 2003.*

Barnes, Sebastian and Garry Young, 2003, "The Rise in US Household Debt: Assessing Its Causes and Sustainability", Bank of England, *Working Paper no.206.*

Beaumont, Craig, 2003,"Household Credit in Korea – A Macroprudential Analysis", International Monetary Fund.

Benito, Andrew, John Whitley and Garry Young, 2001, "Analysing Corporate and Household Sector Balance Sheets", Bank of England, *Financial Stability Review: December 2001,* pp. 160-174.

Cava, Gianni La and John Simon, 2003, "A Tale of Two Surveys: Household Debt and Financial Constraints in Australia", Reserve Bank of Australia, *Research Discussion Paper*, 2003-08, July 2003.

Deaton, Angus, 1992, *Understanding Consumption,* Oxford University Press: New York.

———, 2000, *The Analysis of Household Surveys,* John Hopkins University Press: Baltimore.

Debelle, Guy, 2004, "Macroeconomic Implications of Rising Household Debt", Bank for International Settlements, *BIS Working Papers no. 153*, June 2004.

Dynan, K, K Johnson and K Pence, 2003, "Recent changes to a measure of U.S. household debt service", *Federal Reserve Bulletin*, October 2003.

Edelberg, Wendy M. and Jonas D.M. Fisher, 1997, "Household Debt", The Federal Reserve Bank of Chicago, *Chicago Fed Letter no. 123*, November 1997.

Faulkner-MacDonagh and Martin Mühleisen, 2004, "Are U.S. Households Living Beyond Their Means?", *Finance & Development*, March 2004.

Greene, William, 1997, *Econometric Analysis,* Prentice Hall: New Jersey.

Hillier, David, Adam Law and Nick Verdi, 2004, "Household Debt: Can We Really Afford This?", *Barclays Capital Research*. February 2004.

Hong Kong Monetary Authority, 2002, "The Nexus of Consumer Credit, Household Debt Service and Consumption", *Quarterly Bulletin 1/2002*, pp.35-48.

International Monetary Fund, 2004, "Household Credit in Thailand", background information to the staff report on the 2004 Article IV consultation discussion with Thailand no.SM/04/283, August 2004, pp. 5-15.

Jitsuchon, Somchai, 2003, "Debts and Financial Security of Thai Households After the 1997 Crisis", The Thailand Research Development Institution.

Large, Andrew, 2004, "Puzzles in Today's Economy – The Build up of Household Debt", Bank of England, Speech at the Association of Corporate Treasurers' Annual Conference. March 2004.

Lee, Juliana and Michael Spencer, 2004, "How Stretched are Korea's Consumers?", *Global Markets Research*, February 2004.

Macfarlane, I, 2003, "Do Australian households borrow too much?", *ReserveBank of Australia Bulletin*, April, pp 7–16.

——— , 2003b, "Household debt: what the data show", *Reserve Bank of Australia Bulletin*, March, pp 1–11.

Maddala, G.S.,1983, *Limited-Dependent and Qualitative Variables in Econometrics*, Cambridge University Press: New York.

Maki, Dean M., 2000, "The Growth of Consumer Credit and the Household Debt Service Burden", Federal Reserve, February 2000.

Paulson, Anna and Robert M. Townsend., 2002, "The Nature of Financial Constraints: Distinguishing the Micro Underpinnings of Macro Models." Working Paper, September 2002.

Reserve Bank of Australia, 2003a, "Housing equity withdrawal", *Reserve Bank of Australia Bulletin*, February, pp 1–5.

Tudela, Merxe and Garry Young, 2003, "The Distribution of Unsecured Debt in the United Kingdom: Survey Evidence", *Bank of England Quarterly Bulletin*, pp. 417-427, Winter 2003.

Senivongs na Ayudhya, Chirathep, Pornvipa Tangcharoenmonkong and Thitima Chucherd, 2003, "Balance Sheets and Economic Recovery", Bank of Thailand Research Symposium 2003.

Visa International, 2004, *The Credit Card Report: Credit Card Usage and Debt in Thailand*, Electronic publication: May 2004.

Wooldridge, Jeffrey, 2002, *Econometric Analysis of Cross Section and Panel Data,* MIT Press: Cambridge.

Appendix I: Comparison of credit card market developments in Korea and Thailand

The debate on whether household debt is excessive invariable includes discussion of the recent boom in credit card usage and comparisons to South Korea's credit card crisis. In the Korean crisis, a mass credit card default flooded financial institutions with NPLs and eventually led to a macroeconomic slow-down. Inferring that the Thai credit card boom is headed in the same direction as the Korean experience is unwarranted.

The Thai credit card market is extremely different from the Korean. Although, it is true that the Korean credit card boom began amidst a government-stimulated consumption-led recovery, the similarity ends here. The Korean government stimulated credit card usage through removing the ceiling on cash advances, as well as instituting lottery rewards and tax incentives to encourage the use of credit cards. Moreover, consumer credit information was not widely shared among all types of financial institutions due to legal restriction, leading to instances where many consumers borrowed from one source to pay the others.

The Thai authorities, however, have taken a more conservative and preemptive approach. Unlike Korea, Thailand supported the creation of credit bureaus designed to disperse information on consumer credit history. The new restrictions on credit cards[31] (effective 1 April 2004) will serve to moderate the growth of credit-card usage as well as establish regulations on conducting credit card business to be appropriate, clear and enforceable in the same manner. The measures will therefore help minimize the risk of financial instability arising from high credit card debt burdens. It is noteworthy that not all credit card balances attract interest as some consumers choose to pay all or some of their credit card purchases each month. Visa International, which accounts for roughly 80 percent of Thailand's credit card market, reports the share of credit card balances attracting interest to be approximately 43 percent as of December 2003. Furthermore, outstanding credit card balances currently account for less than 3 percent of household debt. The share of credit card advances to total credit card balances is at 15.3 percent as of the second quarter of 2004 in comparison to South Korea's 57 percent as of the third quarter 2003. Prior to the South Korean authorities' clamp-down on credit card cash advances, the cash advance share peaked at above 70 percent. The high use of cash advances reflected credit card pyramid or Ponzi payment schemes that ultimately proved unsustainable. In comparison, Thai credit card statistics indicate the lack of such trends.

Thai and South Korean Credit Card Statistics			
	Cash Advance (% of total credit card use)	Number of Cards (millions)	Number of Cards per Working Person
South Korea (2003Q3)	57.0	100	4.0*
Thailand (2004Q2)	15.3	8.0	0.2
* peaked at 5 cards per working person end of 2002 Source: CEIC, NSO, NESDB, BOT			

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[31] The new consumer credit card regulations stipulate that debt servicing must be no less than 10 percent of the total outstanding balance. Current card holders will find this particular measure effective on 1 April 2007 so that they may gradually adjust their borrowing and consumption patterns. The repayment measure is immediately effective for new card holders. Furthermore, each cardholder's credit line will be limited to no more than five times of average income.

A more worrying development is the not-infrequent news coverage of draconian and intrusive collection methods. This development is indicative of how consumer rights will become an increasingly important issue in a society demarcated between borrowers and lenders. As the credit card market expands the institutions underpinning the credit card market, whether it be the credit bureaus, the legal infrastructure, or privacy laws must be properly in place so as to maintain market stability, minimize the risks to firms, and protect the privacy and rights of consumers.
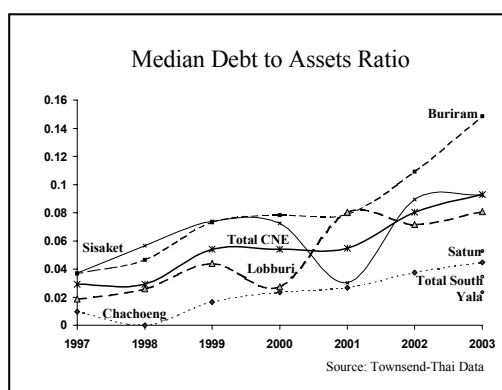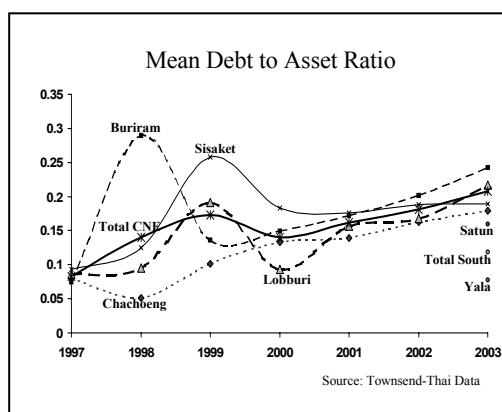
Appendix B: Debt to asset ratios from the Townsend-Thai Project

One useful indicator of a household's debt burden is its debt to assets ratio. Robert M. Townsend's (University of Chicago) Townsend-Thai panel survey is currently the only household survey that provides detailed information on individual household debt and asset value. [32] Given the paucity of data on Thai households' debt to asset ratios at the national level, we therefore provide statistics on debt to asset ratios within the Townsend-Thai survey.

The Townsend-Thai household dataset is a stratified, clustered, random dataset that includes 15 households from each of the 64 villages across four provinces: Chachoengsao, Lopburi, Sisaket and Buriram. The survey is limited to a few provinces but nevertheless has the potential to province a glimpse into the dynamics of household balance sheets within the said villages. The panel survey includes approximately 960 households. As of 2003, the southern provinces of Satun and Yala have been included.

The following figures depict the dynamics of average and median debt to asset ratios from 1997 to 2003. Assets correspond to the non-depreciated sum of household assets, business assets, farm assets, shrimp and fish pond assets, land holdings, household ownership and livestock. Debt corresponds to the amount of money or goods borrowed for each loan owed and each loan completely repaid in the previous 12 months. Both debt and assets may therefore by overestimated.

Consider the left figure on mean debt to asset ratio. In recent years, the ratios indicate a trend towards reaching levels during the nadir of the deep recession in 1998 and 1999. It must be stressed that reaching post-crisis levels does not necessarily indicate the onset of household sector duress as the 1997 crisis did not stem from the household sector. However, the figures do depict a general increase in sample households' debt burden within recent years. Nevertheless, debt to income are still at solvency levels. However, being merely solvent does not preclude the possibility of household duress under debt-amplified shocks as the liquidity and divisibility of assets will also play key roles in the ability of households to shield themselves against shocks.

Mean Debt to Asset Ratio

Source: Townsend-Thai Data

Median Debt to Assets Ratio

Source: Townsend-Thai Data

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[32] For more details, see http://cier.uchicago.edu/intro.htm