Can pure play internet banking survive the credit crisis?

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Abstract

The credit crisis has exposed flaws in the workings of the banking industry. Many banks using the so-called transaction-oriented business model (TOM) have fallen victim to the simultaneous collapse in market and funding liquidity. Banks relying on a relationship-oriented banking model (ROM) have remained relatively shielded from the turmoil in the financial markets. This paper positions the pure-play internet banking model (PPI) as a hybrid business model that, on the surface, combines features of both relationship and transaction banking. Although in terms of customer orientation PPI banks may partly resemble relationship banks, they lack their comparative advantage in generating borrower-specific information. Instead, the characteristic features of PPI banks are low costs and easy scalability. While the latter may enable PPI banks to quickly capture market share, it may also generate overexposure in risky markets. We present a case study on ING Direct, one of the leading global PPI banks and address the sustainability of the PPI business model by comparing the ING Direct foreign operations. The findings for ING Direct are validated using data for E-Trade Bank. We conclude that the strong growth and mono-line nature of ING Direct balance sheets may pose risks when the macroeconomic environment turns sour. Managing growth appears to be the prime challenge to PPI banks.

Keywords: Internet banking, credit crisis, ING Direct, E-Trade

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1. Introduction

The unavoidable time gap in most financial transactions, whereby an initial transfer of funds raises the expectation of a future payback, leads to potential problems of asymmetric information. Lenders need to screen and monitor borrowers to tackle adverse selection and moral hazard problems. This makes the financial sector an information-intensive industry, which is strongly affected by developments in information and communication technology (ICT). ICT has enabled financial institutions to generate, process and disseminate information "better-faster-cheaper" (White 2003), allowing financial institutions to expand their reach and consumers to increase their indebtedness. For example, securitization, the process of converting bundles of non-tradable loans into tradable securities, requires large amounts of information to be collected, transmitted and analyzed efficiently. Although the credit crisis has raised questions regarding the quality of the information being generated – and, more specifically, about the disincentive to invest in information gathering when financial risk can easily be passed on (Buiter 2008) – the ICT improvements are here to stay.

The credit crisis has also exposed flaws in the business models of some banks. The literature on financial intermediation traditionally distinguishes between a relationship-oriented banking model (ROM) and a transaction-oriented one (TOM). Boot (2000) defines relationship banking as financial intermediation that invests in obtaining proprietary information about its clients, evaluating the profitability of its investments by engaging into multiple transactions with one client, either across product ranges, or over time. In contrast, transaction-oriented banking focuses on independent, often impersonal transactions, whereby financial services are commoditized and marketed (Buiter 2008). The credit crisis has drawn attention to the perceived weaknesses of the transaction-oriented model, such as the quality of information being generated and the vulnerability to liquidity shocks. As a consequence, some banks have renewed their focus on relationship banking.

The black-and-white distinction between relationship and transaction banking is not always easy to maintain. In the decade prior to the credit crisis, an ICT-enabled pure-play (i.e. branchless) internet banking model (PPI) has emerged and gained in popularity. On the surface, this model combines features of both relationship and transaction banking. The strategic value of PPI banking is said to stem from significantly lower overhead costs. This enables banks to offer high deposit rates and low service fees, and allows them to grow fast and to quickly capture market share. The model has often been cited in the literature as highly innovative (Dermine 2005; Güttler & Hackethal 2005; Verweire & De Grande 2008). Recently, however, some doubts regarding the sustainability of this new form of financial intermediation have come to the fore. These pertain to the stability and profitability of individual PPI institutions and to their impact on the savings market. The very advantage of the PPI model, easy scalability, may also be its main weakness. While the deposit base of a PPI bank can be expanded quickly by offering competitive rates, the selection of the most interest-sensitive clients may weaken the stability of its funding base. Further,

lacking the infrastructure to screen and monitor loan applicants, a PPI bank may be challenged to quickly invest its funds in ways that cover their high cost of funding but do not entail excessive risks. From a micro-prudential perspective, both effects reduce the stability of individual PPI banks.

On a macro level, one concern is that internet banks tap savings from the traditional relationship banks. This may reduce the pool of savings which is available to small and medium sized enterprises that have no access to capital market funding, and as a result hurt investment and future growth. An additional complication in the European context is that cross-border branches of internet banks can easily tap the European savings market. In the event of failure, this may expose the home country to financial obligations which surpass its tax-bearing capacity. The failure of the Icelandic banks is an extreme case, but other countries face similar exposures. This case has also shown that the cross-border activity of internet banks raised questions about the current European system of financial regulation and supervision.

In light of the observations listed above, we believe that the credit crisis calls for a reassessment of the viability of the PPI model. Pure-play internet banking is a relatively new topic area. The existing literature on PPI is small and focuses on the presumed cost advantage of PPI banks (DeYoung 2001, 2005; Delgado, Hernando and Nieto 2007). The paucity of high-quality data, due to the fact that most PPI banks are small and have been in business for only a short period, hampers empirical research. The current paper therefore uses a case study approach by presenting the case of ING Direct, the largest, global internet bank. We will argue that ING Direct represents a critical case due to its fast growth, size and interest-rate sensitive clients. For purposes of validation, we include an analysis of a second pure-play internet bank: E-Trade Bank.

Prior to the crisis, ING Direct has been the subject matter of many case studies emphasizing the success of its business model (Dermine 2005; Heskett 2005; Sequira, Ryans & Deutscher 2007; Verweire & Van den Berghe 2007). Recently, however, the bank has experienced serious problems, most notably in the US. We use the ING Direct case to find an answer to several questions. Can the PPI model be considered as a hybrid business model, combining features of both ROM and TOM, or does it primarily lean towards one of these models? How does ING Direct cope with scalability? Is the funding base of ING Direct sufficiently stable? Does the interest rate sensitivity of ING Direct clients differ from those of non-PPI banks?

Our paper is structured as follows. First, we try to position the PPI model in the spectrum from relationship-oriented to transaction-oriented banking. Next, we deduce what the PPI positioning implies for the sustainability and stability of the business model. The following section discusses the literature on the traditional business models in banking (ROM and TOM). Section 3 introduces the PPI model and positions it vis-à-vis ROM and TOM. In section 4 we justify our case study approach and introduce ING Direct as well as E-Trade Bank. In section 5, we explore whether the ING Direct

case fits our positioning of the PPI model and examine ING Direct in terms of scalability and funding stability. Section 6 concludes and summarizes.

2. Traditional banking models

This section first briefly discusses relationship banking as the traditional form of financial intermediation by banks, before turning to some of the changes in the banking landscape and to transaction banking. Central to the concept of relationship banking are information asymmetries. Diamond (1984) explains the existence of financial intermediaries by emphasizing their role in mitigating problems of information asymmetry and reducing agency costs. Financial intermediaries do this by specializing in screening and monitoring services. While Diamond (1984) focuses on the benefits of diversification, Greenbaum and Thakor (1995) introduce the inter-temporal reusability of information. Financial intermediaries thus reduce asymmetrical information problems both by diversification (multiple clients) and by reusing information over time (multiple transactions with one client). In the traditional banking model, banks use deposits to fund loans. The typically large number of deposit holders may in turn give rise to coordination and free-rider problems, necessitating financial regulation and supervision to protect deposit holders from excessive risk-taking by banks.

Boot (2000) defines relationship banking as financial intermediation that invests in obtaining proprietary information about its clients and evaluates the profitability of its investments by engaging into multiple transactions with one client, either across product ranges, or over time. A relationship loan is defined as "a loan that permits the bank to use its expertise to improve the borrower's project payoff" (Boot and Thakor 2000, p. 684). Relationship banking may stretch beyond extending loans: it can involve a myriad of different financial services. The primary goal is to add value to the customer, which the bank can do by investing in costly expertise through sector specialization (Boot and Thakor 2000). In this way banks generate value and effectively achieve a competitive advantage over *de novo* lenders. According to Boot (2000), the value-enhancing potential of a relationship over time can permit the funding of loans that are not profitable from a short-term perspective, but may become so if the relationship with the borrower lasts long enough. In addition, the concession of continued bank funding sends a signal of financial stability to other investors.

Thus, in overcoming information asymmetries, relationship banking benefits both lenders and borrowers. But close bank-customer relationships may also have negative effects. A bank may be more lenient towards the customer than would be advisable from a rational point of view, causing a misallocation of funds (soft budget-constraint problem). Since the bank has a monopoly on customer-specific information gathered over the course of a client relationship, its bargaining power

increases with time and it may be tempted to offer loans at non-competitive rates (hold-up problem). The literature is divided on relationship banking's net contribution to overall welfare. Some authors maintain that the advantages of overcoming information asymmetries outweigh the disadvantages and believe that the relationship banking model of financial intermediation provides a net benefit for both lenders and borrowers, contributing to Pareto-efficiency (Diamond 1984; Bhattacharya and Thakor 1993; Boot 2000). Others point out that the costs of soft-budget constraints and hold-up problems may outweigh the positive effects of a relationship-oriented banking model (Sharpe 1990; Rajan 1992; Weinstein and Yafeh 1999).

Whereas relationship banking depends on multiple, informed transactions with a single client, transaction-oriented banks focus on independent, often impersonal transactions. As such, it has been termed finance at arm's-length (Rajan 1992; Boot and Thakor 2000). Transaction banking commoditizes financial relations. It is also referred to as the capital markets model, as trade in commoditized financial instruments often takes place through organized exchanges or OTC markets. Transaction banks differ from relationship banks regarding both lending and funding. In contrast to a relationship loan, a transaction loan is one that does not require costly investments in sector-specific information by the bank. Securitized mortgage loans belong to this category. As regards funding, relationship banks typically rely on deposit-taking, while a transaction bank often has a large share of wholesale funding attracted via the money and capital markets. While securitization and wholesale funding may improve marketability and liquidity, the liquidity improvement can prove fleeting in times of crisis (Buiter 2008). The originate-to-distribute model used in transaction banking reduces a bank's incentive to collect information on the creditworthiness of a borrower and to monitor the performance of a loan. Considering this loss of information, Buiter (2008) perceives the transactions-oriented model as a potentially detrimental form of financial intermediation.

With the perceived failure of the transaction-oriented model in the wake of the credit crisis, it is unsurprising that interest in relationship banking has reignited. Boot and Marinč (2008) conclude that a deep market penetration, a strong local presence and durable customer relationships still form the basis of a bank's competitive advantage. These durable ties to local businesses may act as lifelines in times of economic crisis. Ferri, Kang and Kim (2001) attest to the positive value of relationship banking during the Asian crisis, by showing that relationship banking reduced the liquidity constraints and diminished the probability of bankruptcy of many viable small and medium-sized Korean enterprises. Also from an accounting perspective, relationship loans provide more stability during a crisis. According to the IFRS accounting rules, banks should use fair value for transaction loans but may use amortized cost valuation for non-traded relationship loans (classified under 'loans and receivables'). In October 2008, the IASB amended the IFRS rules to allow the reclassification of some transaction loans as 'loans and receivables'. While this may have

avoided large asset write-downs, it has also made it more difficult to gauge a bank's nature from its balance sheet.

In addition, the credit crisis has stimulated transaction banks to reduce their reliance on wholesale funding and to compete for deposits. The Icelandic banks Landsbanki and Kaupthing are a case in point. Following advice from the rating agencies and the IMF, these banks started to diversify their funding by taking deposits even before the Lehmann collapse. As they had outgrown their home market, the deposits had to come from abroad, prompting them to enter mature markets using internet banking websites and by offering better terms to depositors. In this way Landsbanki was able to raise its share of deposit funding from 25% prior to the crisis to 40% in July 2008 (Buiter & Sibert 2008). When the wholesale markets shut down following the Lehmann collapse, internet banking was also employed by a number of small European banks in their scramble for funding. Quick access to deposit funding via internet banking did not save the Icelandic banks in the end. Instead, their case has raised a number of questions regarding this business model. The following section discusses the rise of internet banking and compares it to traditional banking models.

3. Pure-play internet banking

For banks, as for other firms, the internet has opened up a new distribution channel and a new business model. The internet increases competition by enabling new entrants to compete with established banks in local markets, which can no longer be dominated simply by a bank's physical presence. In practice, a bank can choose between two internet strategies. Most banks maintain their traditional network of branch offices while establishing a website that customers can use to complete transactions online. This business model is known as a 'click-and-mortar' strategy (as opposed to 'bricks-and-mortar', which refers to the traditional model using branch offices to cater to local markets). DeYoung (2005) states that the strategic value of the click-and-mortar business model lies in channeling the routine, low value-added transactions through the internet, while channeling customized, high value-added transactions through the more costly branch network. The bank thus offers clients the option to conduct their transactions online, without losing those customers who prefer banking via branch office employees.

This paper focuses on the second internet strategy: the pure-play internet bank (PPI). In this business model, a bank relinquishes physical offices altogether and establishes a virtual, branchless or internet-only bank (Furst, Lang & Nolle 2000). The presumed strategic value of PPI derives from its lack of physical presence. First, the absence of an expensive branch network may lower overhead costs compared to traditional banks. This cost advantage can be further increased by offering a limited range of commoditized financial products, instead of selling customized products which need face-to-face contact. Second, internet banking may increase the scalability of banking operations, i.e. the ability to cope with increased business volumes without experiencing a negative

effect on the contribution margin. Low costs and easy scalability allow internet banks to capture market share fast. Upon presenting its PPI strategy in 2001, ING Direct stated that it aimed to: "quickly reach sustainable size in large mature markets by offering best value for money, achieved by means of cost efficiency and effectiveness in marketing with the lowest acquisition costs" (Verkoren 2001).

How does the PPI model compare to transaction and relationship banking? At a first glance, PPI and relationship banks share some traits. Both rely on deposit funding, are active in the retail segment and may engage in multiple transactions with one client, either across product ranges or over time (cf. Boot 2000). However, an important ingredient in relationship banking – a bank's investment in obtaining proprietary or sector-specific client information – is not central to the PPI strategy. PPI banks do not engage in customized corporate lending, but mostly offer commoditized loans (mortgages) to households. In processing loan applications, PPI banks will typically rely on 'hard information', which is easy to quantify, store and transmit (Petersen 2004). The absence of a local physical presence precludes the collection of so-called 'soft information', which is qualitative, difficult to transfer and collected in person. Any client-specific information that a PPI bank collects, will require little investment, is not proprietary and will generate few rents. Thus, most mortgages originated (and often securitized) by large financial institutions or PPI banks can be characterized as transaction loans.[1]

Compared to transaction banks, PPI banks operate in a different segment. Whereas PPI banks typically serve consumers in the retail segment, transaction banks operate mainly through the financial markets. The PPI business model is built on the ability to quickly capture market share in mature savings markets. If this strategy is successful, lack of funding is not an issue. In contrast to transaction banks, PPI banks therefore do not rely on wholesale funding. Turning to the other side of the balance sheet, PPI banks may be faced with a surplus of funds when mortgage lending cannot keep up with deposit growth. As we will see below, PPI banks may then resort to (temporarily) investing their surplus funds in securities.

[Insert Figure 1 here]

Figure 1 summarizes the preceding discussion by positioning the PPI model along the dimensions customer orientation and client-specific information. It suggests that the PPI model is a hybrid business model, combining aspects of both relationship and transaction banking. We also conclude

[1] This doesn't imply that all mortgages are transaction loans. The recognition that the originate-to-distribute model may entail a loss of soft (and sometimes even hard) client information, may result in a renewed interest in relationship mortgage lending.

that PPI banks lack relationship banks' key source of competitive advantage, which is the investment in proprietary client information. In its place come lower costs and easy scalability due to the absence of physical branches. We will next discuss the strength of this comparative advantage and the implications for the sustainability and stability of the PPI model.

The literature on PPI banking is small and focuses on the presumed cost advantage and financial performance of PPI banks (DeYoung 2001, 2005; Delgado, Hernando and Nieto 2007). DeYoung (2001) finds that US PPI banks do not have lower overhead costs and are significantly less profitable than regular banks. High ICT expenditures are one reason why the cost advantage turns out to be illusive. PPI banks cannot use the excess system capacity of the mother firm for customer support, computer networks, data processing or the underwriting of loans. Customers expect around-the-clock service, so operating a 24/7 call center is a basic necessity. PPI labor costs are also higher. DeYoung (2001) finds that on average PPI banks pay $7,000 more per year than the average branch bank, as internet banking requires a more highly educated and thus more expensive workforce. Finally, PPI banks' marketing costs are higher, as they need to establish a brand without the promotional benefits of a physical branch network. For non-financial retailers, Rosen and Howard (2000) find that online retailers spend ten times as much on marketing and advertising than physical retailers do. DeYoung's (2001) sample contains many young banks, who have been testing a relatively new business model. This holds out the possibility that the model is viable, as banks progress along the learning curve. In a follow-up paper, DeYoung (2005) argues that PPI banks may achieve scale economies in the future. In another, more recent publication, Cyree, Delcoure and Dickens (2009) argue that although their accounting profits are still not up to par, the profit efficiency of internet banks is higher than that of bricks-and-mortar start-ups, thus attesting to their potential once scale is achieved. Yet in a global sample, Delgado, Hernando and Dieto (2007) find that PPI banks have been outperformed by their traditional competitors. The failure to find conclusive empirical evidence for the profitability of the PPI banking model contrasts with a number of academic case studies trumpeting the success of ING Direct, the largest global PPI, providing low-cost and high-interest financial services (Dermine 2005; Heskett 2005; Sequira, Ryans & Deutscher 2007; Verweire & Van den Berghe 2007).

While the pre-crisis literature has focused on the presumed cost advantage of PPI banks, the credit crisis has drawn attention to the pros and cons of easy scalability in the banking industry. Analyzing the Northern Rock failure, Onado (2009, p. 102) points to aggressive growth as the fundamental cause of the crisis. This growth could only be maintained given an unlimited supply of funding to creditworthy banks in the wholesale markets. The successful introduction of ING's PPI business model in a number of mature savings markets, see section 4 below, attests to its easy scalability. As in the case of Northern Rock, however, aggressive growth raises questions about financial stability. What are the risks of pure-play internet banking in times of financial crisis?

The easy scalability of PPI banks may result in a less stable funding base compared to traditional banks. PPI banks are likely to attract relatively interest rate sensitive clients. DeYoung (2001) calls these the financially savvy 'hit-and-run' customers, who search the web for attractive deposit rates and are not interested in purchasing other services. Most banks initially try to attract savers with high teaser rates, which, over time, start to lag behind market rates. With hit-and-run customers this pricing strategy does not work. The interest rate sensitivity of PPI customers implies that PPI banks need to keep interest rates at high levels to keep customers or be faced with deposit outflow as well as inflow and thus a high volatility of its depositors-base. ING Direct UK experienced this when between 2006 and 2008 its deposits dropped from £24.4 bln to £15.5 bln due to uncompetitive rates.

In addition, such a successful introduction of the PPI concept in a mature savings market may expose a mismatch in the scalability of assets and liabilities. The loan department will find it difficult to keep up with strong deposit growth *and* earn the high yield needed to satisfy its interest sensitive clients. As a result, either lending standards will be relaxed or funds will be reinvested in the financial markets, introducing further financial instability on the asset side of the balance sheet. ING Direct USA experienced this type of instability after it had invested a large part of its funds in Alt-A RMBS securities (see below).

To these micro-prudential concerns about the stability of the individual PPI bank can be added concerns about the stability of the market as a whole. By offering high rates whilst operating under deposit guarantee schedules, PPI banks may erode the funding base of the traditional relationship banks. When their savings are tapped by PPI banks, relationship banks will find it harder to extend credit to firms. Especially in an economic downturn, relationship banks are needed to reduce SMEs liquidity constraints and diminish their probability of bankruptcy, as shown by Ferri, Kang and Kim (2001) for Korean businesses during the Asian financial crisis. Finally, insofar as PPI banks are active as cross-border branches within the EU or EEA, they provide a challenge for supervisory authorities and complicate the system of deposit insurance. When the Icelandic banks failed, foreign savers had to rely on the ability of the Icelandic government to guarantee an amount of deposits which by far exceeded Icelandic GDP.

Summing up, PPI banking can be conceived as a hybrid business model, positioned in between the traditional relationships-oriented banking model and a transactions-oriented banking model. The pre-crisis literature has raised question marks as to the profitability of PPI banks. The credit crisis has added further doubts related to their financial stability. Below we will address these questions and doubts using the case of ING Direct.

4. The case study approach: methodology and background

4.1 Case study approach

When little is known about a phenomenon and existing perspectives are contradictory, inadequate to explain current events, or not supported by empirical evidence, a case study can be an appropriate research method to generate new insights (Eisenhardt 1989; Yin 2003). Case study research is capable of studying causal mechanisms in greater detail than other research methods and allows the formulation of a comprehensive theory: one not only explaining why emerging relationships exist, but also detailing under what circumstances they are expected to hold. The triangulation made possible by multiple sources of data, both quantitative and qualitative, helps substantiate new constructs and hypotheses (Eisenhardt 1989; Yin 2003; Jaspers 2007). Case study research relies on theoretical sampling, not statistical or random sampling (Eisenhardt 1989; Yin 2003). As Eisenhardt (1989) puts it, theoretical sampling focuses effort on theoretically useful cases, meaning those that replicate or extend the emerging theory by filling conceptual categories. Thus, it makes sense to choose an extreme or 'polar' case (with large values for X), in which the process of interest is transparently observable (comparable to the 'least likely case' in Gerring 2007). We aim to substantiate hypothesized causal relations by presenting a case study of ING Direct, representing a critical case due to its fast growth, size and interest-rate sensitive clients. Hypothesized causal relations are expected to be strong and transparently observable. We use the case to test whether our propositions are correct as well as articulate why and under what conditions these causal relationships tend to exist.

We present a single case study with embedded units of analysis: ING Direct Canada, USA, Australia, Germany, Austria, United Kingdom, Spain, Italy and France. Analytical techniques such as pattern matching, time series analysis, explanation building and cross-case synthesis are used to obtain detailed results. The comparison between geographical segments yields important insights into the how and why of uncovered causal relations. Conducting a longitudinal analysis of both crisis and non-crisis period, we examine whether measured relationships change with the economic environment. Since our empirical analysis of ING Direct is based on a small database with a limited number of observations, the findings are replicated within a cross-case context using data for E-Trade Bank to enhance both internal and external validity.

4.2 ING Direct

ING Group NV, formed in 1991 with the merger of Nationale-Nederlanden and NMB Postbank Groep, is one of the largest savings banks in the world, which is for a large part due to its internet banking activities under the global ING Direct brand. The group has established pure-play internet banks in nine major developed countries: Canada, USA, Australia, Germany, Austria, United Kingdom, Spain, Italy and France. In the first four countries, ING Direct operates through

subsidiaries, which are supervised by host authorities and fall under local deposit guarantee schemes. In the latter four countries ING Direct operates through branches of its Dutch legal entity ING Direct NV. In the current legislative environment, deposits attracted via such foreign branch offices fall under the deposits guarantee facility of the country in which the main firm is based, in this case the Netherlands. Austrian savers are served through the German subsidiary. Both ING Direct NV and the foreign subsidiaries are part of ING Group.

Since its conception, ING Direct has experienced strong growth. It has often been cited as a successful example of strategic innovation. This section briefly summarizes the strategy of ING Direct. The case studies by Dermine (2005), Heskett (2005), Sequira, Ryans & Deutscher (2007) and Verweire & Van den Berghe (2007) provide further details. ING Direct's strategy is based on simplicity. It relies on offering straightforward banking products, aggressive pricing, strong branding, standardized processes and strong growth to quickly achieve cost efficiency by means of economies of scale. The strategy includes entering large, mature markets with sufficient infrastructure for direct banking; launching with a simple and attractive savings account in order to attain critical size as quickly as possible; and subsequently introducing a second product, usually mortgages, adapted to the local market. All products are marketed using local campaigns, for a large part via direct channels (the internet, telephone and e-mail). Over time, ING Direct has expanded its range of products with consumer investment products and payment accounts. Summing up, ING Direct's competitive strength lies in creating simple product offerings that meet customers' needs; in discouraging relationship banking and encouraging self-service; and in a strict adherence to the low cost direct model.

Since the launch of the ING Direct pilot in Canada in 1997, ING Direct has experienced rapid growth, achieving €100 bln in funds entrusted by the end of 2003 and doubling this by the year 2006. With over 22 million clients and more than €200 bln of funds entrusted, ING Direct is the largest internet bank in the world. Of all ING Direct operations, ING-DiBa (in Germany and Austria) and ING Direct USA are by far the largest (both with over €50 bln in funds entrusted as of June 2009). ING-DiBa is the only non-greenfield operation of ING Direct. DiBa (Allgemeine Deutsche Direktbank) was founded in 1965 and has focused on pure-play internet banking from 1994 onwards. The bank entered into a strategic partnership with ING in 1998. In 2002 ING Group acquired a majority ownership stake of 79%. With the takeover of DiBa's competitor Entrium Direct Bankers AG in 2003, DiBa became the largest pure-play internet bank in Europe. As of July 2003, DiBa became 100% ING-owned, changing its name to ING-DiBa in June 2004. That year, the bank also expanded its activities to the Austrian market. Supported by acquisition of Entrium, ING-DiBa rose to the no. 4 position in the German retail banking industry (Güttler & Hackethal 2005). As of the end of 2007, ING-DiBa ranked no. 2 in the savings, mortgage and funds/brokerage business.

In contrast to DiBa, the story of ING Direct USA is one of fast autonomous growth, based on a greenfield operation. Since its launch in September 2000, the bank has achieved a total of $75.1 bln in deposits and over 7.6 million customers (as at December 2009), rendering it the no. 3 savings bank and no. 1 direct bank in the US. Due to its large exposure to the US mortgage market, ING Direct USA played a major role in the difficulties experienced by the ING Group during the credit crisis. Market conditions have forced ING Direct to write down €1,876 mln in impairments on its US Alt-A RMBS portfolio in 2008, and another EUR €491 mln in 2009 (Q1 and Q2). In January 2009, the ING Group has taken advantage of an Illiquid Assets Back-Up Facility offered by the Dutch state in January 2009. Under this facility, 80% of the risk of the $36.4 bln US Alt-A RMBS portfolio is transferred to the Dutch government. This deal has enabled ING to shield its capital from further asset write-downs, but has at the same time invited the scrutiny from the EU competition authorities.

The remaining ING Direct subsidiaries and branches are much smaller (between €10 – 20 bln as at December 2009). ING Direct Canada was launched in May 1997, as a pilot for the ING Direct concept. Since 2000, it has been the no. 1 direct bank in Canada. In May 1999, ING Direct launched a second direct bank in Spain. After being operational for ten years, this is now the largest direct bank in Spain, with over €14.6 bln in funds entrusted. ING Direct Australia started operations in August 1999. The popularity of ING Australia's initial 'Savings Maximizer' led total deposit volume to grow from A$9.9 bln in 2002 to A$30.0 bln in 2009. Similarly, the success of its 'Mortgage Minimizer' led its mortgage balance to increase from A$8.7 bln in 2002 to A$34.5 bln in 2009. The bank became Australia's 5th largest retail savings bank and in a position to challenge the 'Big 4' of the Australian banking industry. ING Direct branched out to France in March 2000, quickly achieving fast deposit growth and reaching €13 bln in deposits by the end of 2007. Operational as of March 2001, ING Direct Italy enjoyed similar growth in its initial years, quickly achieving €14 bln in deposits (end-of-year 2006). ING Direct UK was launched in May 2003. After its initial success (mid 2006 its deposits exceeded £25.5 bln), ING Direct UK witnessed a withdrawal of funds in the year 2007, as its rates were lagging behind the rising base rate, hitting a low in September 2008, with total funds at £15 bln. In October 2008, the UK Treasury announced the transfer of £2.5 bln of deposits held by British savers with Icelandic-owned bank Kaupthing Edge to ING Direct UK. In addition, ING Direct announced the acquisition of £0.5 bln of savings held with Landsbanki-owned Heritable Bank. But as at December 2009, total deposits still amount to no more than £15.8 bln.

In recent years, ING Direct's growth has slowed down markedly, with total funds entrusted hovering around €200 bln. In addition to the difficulties it has experienced in the UK, a failing consumer confidence since the start of the financial crisis has resulted in an outflow of funds in 5 of the 9 countries in which ING Direct is active. Since the end of 2008, deposits dropped in Spain, Australia, France, Italy and in Germany/Austria. More serious still are the impairments of the

securities portfolio of ING Direct USA, which have affected the profitability and stability of the ING Group as a whole. As part of a deal with the EU competition authorities, in October 2009 ING Group announced its intention to put ING Direct USA up for sale and to separate its insurance from its banking business.

4.3 E-Trade Bank

We have selected E-Trade Bank, the second-largest PPI bank of the United States (ING USA is the largest, with total assets amounting to US$90 bln), with US$ 45 bln in assets as at December 2009, for a cross-case study. Founded in 1992, E-Trade Financial Corporation started out as a deep-discount online brokerage services provider. Today, its diversified portfolio includes traditional banking services.[2] Subsidiary E-Trade Bank is a federally chartered savings bank insured by the FDIC. With such products as high-rate checking and savings accounts and straightforward mortgage loans, E-Trade Bank has achieved fast growth in the period 1998 – 2007. Since the start of the credit crisis, however, the bank has suffered both deposit outflow and a persistent mortgage balance decline. Expecting the same causal mechanisms affecting ING Direct to be at work here, we provide an analysis of data on E-Trade Bank for a sample period ranging from 1993 to 2009. If the findings in this cross-case study corroborate the results of the ING Direct case, this will add to the robustness of our results and offer some opportunity for generalization.

5. Empirical results

5.1 Positioning the PPI business model

In this section we first look at balance sheet data of ING Direct to position its various foreign operations along the dimensions customer orientation/client specific information (cf. Figure 1) and thus compare it to the traditional banking business models (ROM and TOM). In the second and third sections we discuss the issues of scalability and funding stability.

In order to see to what extent the ING Direct business model fits the ROM/TOM definitions of Boot (2000) and Buiter (2008), we benchmark ING's foreign internet banking divisions against the group's domestic retail bank. Where possible, we include data on both foreign subsidiaries and the foreign branches. As data are more readily available for separate legal entities, some of the analyses below exclude branch data. Table 1 reports recent simplified balance sheets for ING's Dutch retail bank, its foreign ING Direct subsidiaries and (partially) the foreign ING Direct branches. We have included E-Trade for comparison and validation. A few observations stand out. First, while corporate lending is a sizable activity of the Dutch retail bank, is it virtually absent from ING

[2] For more information on E-Trade Financial Services and its history, see Gupta, Hatter and Pinnoju 2008.

Direct's foreign activities. Second, funding at ING Direct is predominantly through deposit-taking (with the exception of Australia, which also uses some money-market funding). Third, all subsidiaries are active in local mortgage lending, especially in Canada and Australia. The German and US subsidiaries also invest a relatively large share of assets in securities. Note that subsidiaries are usually required by their host supervisors to (partially) balance their assets and liabilities regionally. Fourth, not all European branches of ING Direct engage in local mortgage lending. In France, ING Direct is absent from the mortgage market, while in the UK, mortgage activity is quite low (7% of funds entrusted). In contrast, mortgage lending is much higher in Spain (51% of funds entrusted) and Italy (37% of funds entrusted). The branch format thus offers ING the choice to be locally active in funding only, or in both funding and investing and seems to be more flexible than the subsidiary format.

[Insert Table 1 here]

Table 1 broadly confirms the positioning of PPI in Figure 1. ING Direct targets the consumer segment by taking deposits and offering mortgages, but does not engage in corporate relationship lending. It is surprising, however, that the subsidiaries of ING Direct are quite active in financial markets. This holds especially for ING Direct USA, which invests more than 50% of assets in securities. Investing in securities is not ING Direct's deliberate policy, but rather a by-product of differences in scalability between assets and liabilities. It is a stop-gap solution to the problem that mortgage lending takes more time than deposit taking. As confirmed by ING (ING Group 2008), ING Direct USA has not able to originate mortgages fast enough so as to keep up with its deposits growth. Being legally bound to reinvest its money in local mortgage-related products, the bank has made considerable investments in Alternative-A Residential Mortgage-Backed Securities (Alt-A RMBS).[3] Between 2000 and 2008, securities constitute on average 68% of total assets of ING USA.

The German subsidiary, ING-DiBa, achieved comparable size not by autonomous growth, but by taking over existing businesses (Allgemeine Deutsche Direktbank, Entrium and Interhyp). These businesses had time to grow a solid mortgage base. This seems to show in today's balance sheet: ING-DiBa has a higher proportion of mortgages and a lower share of securities than ING Direct USA. A large portion of the securities still on today's balance sheet was purchased in the pre-takeover years 2001 and 2002, when deposits growth was highest.

The other subsidiaries have not managed to reach a size quite as impressive as that of ING USA or ING-DiBa. ING Canada's mortgage lending has grown at about the same pace as its deposits

[3] These securities have risk profiles in between prime and subprime and bear AAA or AA ratings.

funding, resulting in a smaller gap of 22% invested in securities. Australia was the setting for a particularly booming housing market.[4] In addition, the savings market was characterized by tough competition, notably from Australia's big four. This combined with a deposit outflow to these four banks in the year 2008 triggered by uncertainty surrounding coverage of ING Direct's deposits by the government's insurance scheme might be reason why at ING Australia, mortgage lending actually started overtaking deposits growth from 2006 onwards, forcing ING Australia to increase its money-market funding (debt issues in the form of corporate bonds, floating rate notes and A$1 bln in redeemable preference shares issued to ING Bank NV in 2008).

In the next section, we discuss these issues of scalability in more detail. Important in terms of positioning, is that the heavy investments in securities have impacted the overall character of the US banking division. The left-hand side of its balance sheet looks more like that of a transaction bank than that of a relationship bank. Judged from the liabilities side of the balance sheets in Table 1, ING Direct would resemble a traditional relationship bank. All branches and subsidiaries carry a large amount of deposits, even compared to ING's domestic activities. But Boot's definition of relationships-oriented banking hinges on the presence and utilization of proprietary information. The relatively large amounts of securities and standard mortgages and the tiny share of corporate loans on the ING Direct balance sheets fit uneasily with this definition. The case of ING Direct exposes the difficulty of applying the definition of relationship banking in practice.

In principle, it is possible for clients to have both a savings account and a home loan with ING Direct. By engaging into multiple transactions with these clients over time, in theory, ING Direct has the opportunity to build a relationship and obtain proprietary information. Some ING Direct customers will thus receive financial services that formally fit Boot's definition of relationship banking. But since ING Direct's products are commoditized and there is little personal contact between customers and bank personnel, one can question the amount and the quality of the information that is being gathered from these customers. In addition, ING Direct hardly extends any corporate loans – one of the most important sources of proprietary information. Furthermore, it is clear from the data that ING Direct reinvests a large amount of deposits in securities. There thus appears to be a group of customers who conduct no further business apart from opening a savings account. These customers may have been attracted by a high savings rate on their internet account, but apparently prefer to receive other financial services elsewhere. This group makes up a substantial part of the total client base. As ING does not conduct multiple transactions with these customers, little proprietary information can be obtained from them. We conclude that ING Direct

[4] The Australian housing market is the only market where total mortgage lending more than doubled in the period 2002 – 2007.

fails to fit Boot's definition of relationship banking in a stricter sense and seems to lean more towards Buiter's definition of a transaction bank.

With a large position in securities, the absence of corporate loans and high reliance on deposit funding, the balance sheet of E-Trade roughly confirms the findings for ING Direct. Different from the ING Direct subsidiaries and ING the Netherlands, E-Trade carries a small amount of consumer loans on its balance sheet. These are non-secured loans to individuals for household, family and other personal expenditures, including outstanding credit card balances, student loans and medical expenses. Like ING Australia, E-Trade has made some use of money-market funding ('other liabilities' includes advances from Federal Home Loan banks, federal funds purchased and securities sold under repurchase agreements). At E-Trade, like at ING Australia, mortgage growth overtook deposits growth in the period 2003 - 2005, forcing E-Trade to supplement its deposit funding by money-market funding. Deposits growth revived in 2006, bringing the percentage of alternative funding down. Money-market funding now makes up approximately 21% of total liabilities (coming from a high at 46% in 2005). The above leads us to conclude that, as concerns positioning, E-Trade corroborates the results for ING Direct.

5.2 Scalability

We next examine the issue of scalability in more detail. Figure 2 plots time-series for deposits, mortgages and securities for the four foreign ING Direct subsidiaries. Figure 3 shows the same time series for E-Trade.

[Insert Figures 2 and 3 here]

The graphs show that in the markets where deposit growth was strongest - Germany and the US – funds were mainly invested in securities (at least initially). The strong deposit growth in Germany between 2001 and 2003 is mirrored in an equally strong growth in securities. For the US, deposits and securities grow at the same pace till the eve of the credit crisis. The picture is very different for Australia, where deposits and mortgages grow hand-in-hand and securities constitute a just small fraction of assets. The Canadian data show a mixed picture, where the initial predominance of securities has been overtaken by mortgages after 2003. The visual impression from Figure 2 suggests that strong deposit growth creates the need to park surplus funds in securities and thus leads to a high share of securities in total assets.

We formally test the hypothesis that deposit growth may influence PPI banks' balance sheet composition by means of a panel analysis, using data on the five ING Direct entities that engage in comprehensive financial reporting (these are the ING Direct subsidiaries in the US, Germany, Canada, Australia and the Netherlands). The basic specification of our panel model is:

$$secur/assets_{j,t} = \beta_{j,0} + \beta_{t,1} + \beta_2 d\log(dep)_{j,t} + \varepsilon_{j,t} \quad (1)$$

where $secur/assets_{j,t}$ is the share of securities in total assets for ING entity j at time t and $dlog(dep)_{j,t}$ denotes deposit growth for entity j at time t. Equation (1) includes both cross-section and period fixed effects. We add to this basic specification the following control variables: housing price growth in market j, denoted *dlog(hp)*, and the size of the five different entities, measured by the log of total assets, denoted *log(assets)*. We perform a similar regression using the share of mortgages in total assets, denoted $mortg/assets_{j,t}$ instead of $secur/assets_{j,t}$.

The data are end-of-year and run from 2001 to 2009. Table 2 reports the results of the Levin, Lin & Chu (2002) panel unit root test on our variables. The test statistics indicate that the null hypothesis of a unit root can be rejected for all variables. Given the limited sample, the results of the panel unit root test should, however, be interpreted with caution. As an extra robustness check, we also present estimation results including the lagged dependent variable. All estimates are done for both the full sample period and for a subsample which excludes the credit crisis (2008-2009). One reason for excluding the period 2008-2009 is that in times of financial crisis the causality in equation (1) might reverse, as PPI banks which invested heavily in risky assets could suffer most from deposit flight. This implies that we would expect a stronger positive relationship between deposit growth and asset composition for the pre-crisis period. A separate analysis for the 2008-2009 period to test the reverse causality yields insignificant results due to a lack of observations. The estimation is done using pooled least squares and uses White standard errors to accommodate serial correlation and time-varying variances in the disturbances.

[Insert Tables 2 and 3 here]

The panel results are reported in Table 3. Deposit growth is positively related to the securities-to-assets ratio and negatively related to the mortgages-to-assets ratio. These relationships are significant at a level of 5%. Interpreting the coefficient of 0.127 in panel A, a deposit growth of 40% (the average deposit growth for ING Direct USA) would increase the securities-to-assets ratio by 0.05 (or five percentage points). The coefficient on deposit growth increases to 0.184 when we include the lagged dependent variable in our model and to values above 0.2 when we exclude the period 2008-2009, which indeed suggests that the reverse causality effect may have been at work during these years. The coefficients on the mortgages-to-assets ratio are even higher, indicating that in times of high deposit growth, mortgage origination cannot keep up the pace. Fast (deposit) growth, reputedly the cornerstone of a PPI bank's success, thus seems to strengthen a PPI bank's

drift towards the transaction-oriented model. Table 3 also reports the results for Bartlett test on the equality of the residual variances across panel members, indicating that there is no evidence of cross-sectional heterogeneity in the residuals.

The issue of scalability should also be interpreted against a macro-economic backdrop. In the decade prior to the credit crises, housing prices and mortgage lending saw strong growth rates in many markets. Table 4 summarizes the evidence for the markets in which ING Direct is active. The buoyant macro-economic environment raises two questions. First, the experience of ING Direct prior to the crisis (cf. Figure 2), may understate the problem of PPI banks to match their lending and investing to high deposit growth. The mono-line nature of its asset side implies that the success in investing deposits profitably depends to a large extent on the state of the housing and mortgage markets. If growth in these markets slows down or turns negative, ING Direct will find it more difficult to invest its funds and it may need to slow down deposit growth. Second, if ING Direct selects markets based on their growth potential (i.e. their potential to generate deposits *and* mortgage investments) it may end up being overexposed to markets which experience housing bubbles. A case in point is that in the only market where housing prices and mortgage lending did *not* grow prior to the crisis (Germany), the strong growth of ING Direct resulted from takeovers instead of autonomous growth.

[Insert Table 4 here]

We next try to validate the ING outcomes by applying the same panel model to E-Trade Bank. We use end-of-year balance sheet data from the FDIC database of thrift reports. Our panel consists of two members (E-Trade versus all other FDIC insured banking institutions) and runs from 1993 to 2009. The specifications and control variables are the same as in Table 3. However, the estimation differs in two regards: the inclusion of US national housing price growth (a variable which is identical for both panel members) precludes the use of period fixed effects and the heteroscedasticity across panel members necessitates the use of generalized least squares using cross-section weights. Table 5 shows that the results for the unit root tests are mixed: for the asset ratios the null hypothesis of a unit root cannot be rejected. As by definition the asset ratios have to lie between 0 and 1, this outcome is puzzling. We proceed by estimating the panel regression in levels and again add specifications including the lagged dependent variables as an extra robustness check. Table 6 reports the results. As in Table 3, deposit growth is positively related to the securities-to-assets ratio and negatively related to the mortgages-to-assets ratio. The coefficients on deposit growth are, however, smaller than in the case of ING Direct. This could be due to the fact that the PPI weight in this dataset (i.e. the weight of E-Trade vs. all FDIC-insured banking institutions) is substantially smaller than the PPI weight in the ING Direct dataset. Still, the results

for E-Trade Bank confirm the relationship between a PPI bank's deposits growth and its balance sheet composition.

Both the graphs and the regression results show that when deposit growth slows down, the PPI banks gradually adjust their balance sheets by reducing their reliance on securities. However, this process can take a number of years, during which the bank is vulnerable to shocks in financial markets. So their short-term imbalance may have longer-term consequences.

[Insert Table 5 and 6 here]

5.3 Funding stability

With regard to funding stability we need to distinguish between two separate sources of instability in PPI funds. The first arises from a potential lack of confidence of deposit holders, while the second relates to the interest-sensitivity of PPI banks' clientele. The confidence issue applies in principle to all banks. By offering liquid assets that can be withdrawn on demand, banking is an intrinsically unstable business. This is one of the reasons why banks traditionally have impressive premises. ""Look", these buildings proclaim, "our institution is as solid as a mountain of stone or a castle of steel and glass"" (Wolf 2009, p. 16). PPI banks lack such a visible – though often illusive - symbol of soundness.[5] Ultimately, however, deposit holders' confidence in banks – whether PPI or traditional – is maintained through government deposit guarantee schemes. Applied to ING Direct, the confidence issue is further complicated by ING's strategy to create a global savings brand and by the fact that the precise form of deposit protection depends on the legal format (branch versus subsidiary). While creating a global internet savings brand under the ING Direct label has been a highly innovative and, at least initially, successful marketing strategy, it also exposes all operations to negative spillovers from local mishaps. For example, on hearing about the losses at ING Direct USA, Canadian deposit holders might have withdrawn funds from ING Direct Canada. In Europe, the credit crisis may have sparked closer scrutiny by depositors regarding their protection. Some deposit holders in the British, French, Italian or Spanish branches may have preferred protection from their own government to guarantees from a small country such as the Netherlands (witness the case of Iceland described above). When fear overtakes financial markets and the public seeks safety close to home, a global internet bank is vulnerable. While generally savings were up due the precautionary savings motive, the end of 2008 witnessed the withdrawal of funds entrusted in 5 of 9

[5] In this context, one can question ING Direct's judgement in sponsoring Formula 1 racing. ING announced in February 2009 that it would not renew its sponsorship contract with Renault due to the credit crisis. In September 2009, ING abruptly terminated the existing contract after a ruling on race fixing.

markets in which ING Direct is active (deposits in Spain dropped €1.7 bln in Q4 2008, in Australia AUD 0.8 bln, in France €2.0 bln, in Italy €0.3 bln and in Germany/Austria €1.3 bln).

The second source of funding instability derives from the interest-sensitivity of customers. A common pricing strategy in the banking industry is to attract savings through high initial 'teaser' rates and increase profitability later by either lowering rates or not adjusting rates upward when market rates rise. This strategy works when customers are inert and do not shift savings in search of the highest yield. As described above, DeYoung (2001) argues that this strategy will *not* work for PPI banks, as they select the interest sensitive 'hit-and-run' customers. This implies that any attempt to use interest rate setting to increase profitability may invoke more funding instability for PPI banks than for traditional banks. Some anecdotic evidence that this is indeed the case comes from the UK, where an outflow of funds at ING Direct UK was triggered by uncompetitive rates. Figure 4 compares ING Direct UK savings rates to the Bank of England's base rates. Indeed, the period when ING Direct UK started to offer less competitive interest rates corresponds to the period in which the amount of funds entrusted started to decline.

[Insert Figure 4 here]

The hypothesis that PPI banks have more interest sensitive customers is difficult to test, as bank-specific historical interest rates (as offered to the customer) are usually unavailable. Nonetheless, we will use publicly available data to test the interest rate sensitivity hypothesis in two ways. Our first test is implicit in the sense that it does not use data on the flow of deposits. The idea is that the interest expenses of PPI banks should follow market rates more closely than the interest expenses of other banks - at least in the upward phase of the interest rate cycle - if PPI banks indeed would be faced with a credible threat of deposit withdrawals by interest-sensitive customers. For the US, we have quarterly data on bank-level interest expenses from the FDIC reports. We use the FDIC data to investigate how the interest expenses of ING Direct USA and E-Trade respond to market rates and compare this to US banking industry as a whole (i.e. all FDIC-insured institutions). As the market rate we choose the Fed funds rate, denoted *ffr*. Interest rates expenses are taken as a percentage of total liabilities, denoted *intexp/liab*. As unit root tests on both *ffr* and *intexp/liab* fail to reject the null of a unit root (not reported), we perform our analysis in first differences. Table 7 reports the outcome for the following panel regression model:

$$d(int\,exp/liab)_{j,t} = \beta_{j,0} + \beta_{j,2} d(ffr)_t + \varepsilon_{j,t} \qquad (2)$$

where panel members *j* are E-Trade (ETR), ING Direct USA (ING) and all FDIC-insured institutions (AI). As equation (2) includes both cross-section fixed effects and cross-section specific coefficients, running separate regressions for the panel members would have produced the same results. Table 7 shows that for the complete sample, the differences in $\beta_{j,2}$ are small and, judged by the Wald test statistic, insignificant. So, for the complete sample no difference can be discerned between the way in which interest expenses of ING Direct, E-Trade and the US banking industry respond to changes in the Fed funds rate. Yet this conclusion changes when we differentiate between upward and downward movements in the Fed funds rate. Table 7 reports a strong response of PPI interest expenses to a monetary tightening (an upward change in *ffr*). The coefficients for E-Trade and ING are between 0.69 and 0.90 and differ significantly from the coefficient of 0.299 for all institutions. This finding supports the hypothesis that PPI banks have more interest-sensitive customers than traditional banks. Although in the downward phase the coefficient is highest for all institutions, implying that PPI banks reduce rates less quickly than traditional banks, these differences are not statistically significant.

[Insert Table 7 here]

Our final test relates deposit growth to interest expenses. The empirical analysis is again hampered by the fact that we do not have data on the historical interest rates and money flows on a product level. In addition, deposit growth can be influenced by many other factors besides interest rates. We try to deal with this problem by measuring both deposit growth and interest expenses of ING and E-Trade relative to the market as a whole. This results in the following basic specification:

$$d\log(dep) - d\log(dep\_ai)_{j,t} = \beta_{j,0} + \beta_1 d(int\,exp/liab - int\,exp/liab\_ai)(-1)_{j,t} + \varepsilon_{j,t} \qquad (3)$$

where $dlog(dep)\text{-}dlog(dep\_ai)_{j,t}$ measures the difference between the deposit growth of panel member *j* (either ING or E-Trade) and the market as a whole (all institutions) and $d(intexp/liab\text{-}intexp/liab\_ai)_{j,t}$ denotes the change in the interest expense ratio of panel member *j* compared to the market. Our null hypothesis is that β_1 is positive, implying that when ING and/or E-Trade pay higher interest expenses – and thus become more attractive to interest-sensitive savers – their deposit growth will outperform the market. Equation (3) is further expanded by four control variables: the change in the fed funds rate, housing price growth, the log of deposits and the lagged dependent variable. The first two control variables capture changes in the economic environment, while the latter two control variables capture deposit growth dynamics for both panel members. As the crisis may have triggered deposit (out)flows unrelated to interest expenses, the panel regressions are executed for both the full sample period and a sub-period excluding the credit crisis. Table 8 shows that β_1 is

positive and significant: a one percentage point above-average interest expense ratio would result in above average deposit growth between 10 and 20%. Ideally, our funding stability hypothesis should be tested using product level data on rates and flows, which unfortunately are confidential. Nonetheless, our findings in Tables 7 and 8 offer some evidence in support of the hypothesis that PPI banks have more interest sensitive clients.

[Insert Table 8 here]

6. Conclusions

Up to now, the literature on PPI banks has focused on their financial performance compared to traditional banks. Authors often stress PPI's positive prospects (DeYoung 2005; Cyree, Delcoure and Dickens 2009). Even prior to the credit crisis, the evidence that their low-cost business model enables PPI banks to reap superior profitability was mixed at best. During the credit crisis, some doubts regarding the sustainability of this new form of financial intermediation have come to light. The very advantage of the PPI model, easy scalability, may also be its main weakness. This paper focuses on the dark sides of the PPI business model. We use the global internet bank ING Direct for a case study and include data from E-Trade Bank for purposes of validation.

We start off describing PPI banking as a hybrid business model that, on the surface, combines features of both relationship and transaction banking. Although in terms of customer-orientation PPI banks may partly resemble relationship banks, they lack their comparative advantage in generating borrower-specific information. Instead, the characteristic features of PPI banks are low costs and easy scalability. Easy scalability appears to be a mixed blessing. While it enables PPI banks to quickly capture market share in the savings market, it also raises the problem of what to do with the acquired funds. The case of ING Direct shows that the faster deposit growth, the more difficult it is for lending to keep up. Differences in scalability between the assets and liabilities sides of the balance sheet are at the heart of the troubles at ING Direct USA, where management decided to park surplus funds in Alt-A mortgage-backed securities. The need to quickly invest acquired savings may have also led ING Direct to be active in buoyant housing and mortgage markets and may thus have generated overexposure in risky markets. At both ING Direct and E-Trade Bank, deposit growth is positively related to the securities-to-assets ratio and negatively related to the mortgages-to-assets ratio. Fast (deposit) growth, reputedly the cornerstone of a PPI bank's success, thus seems to strengthen a PPI bank's drift towards the transaction-oriented model. We conclude that the strong growth and the mono-line nature of ING Direct foreign balance sheets may pose risks when the macroeconomic environment turns sour and that managing growth appears to be the prime challenge to PPI banks.

A second dark side of PPI banking relates to funding stability. PPI banks lack the local physical presence which may inspire a minimum of confidence in deposit holders and thus need to rely on governmental deposit guarantees to maintain depositors' confidence. In addition, ING Direct had to manage the reputation damage to its global brand arising from the difficulties in the US and the complexities of deposit protection, for which the legal structure varies from country to country. In this context, the credit crisis has also raised doubts about the viability of global savings banks headquartered in small home countries. Next to the confidence issue, the high interest- sensitivity of PPI banks' customers implies that any attempt to increase interest rate margins by lowering savings rates put the bank's funding stability at risk. This case study of both ING Direct and E-Trade offers some evidence in support of the hypothesis that PPI banks have more interest sensitive clients than regular banks, as the two PPI banks attract significantly more new deposits than regular banks when raising their interest rate levels, as well as follow rises in the market rate more closely.

In light of the foregoing discussion, do we need PPI banks at all? Even when PPI banks manage their growth prudently and refrain from investing in the capital markets, they face a certain funding instability due to their interest rate sensitive client base. Worse still, their business model does not require the production of proprietary, or 'soft', information. The loss of information in this new, ICT-driven banking model should not be considered lightly. Mishkin (2006) maintains that banks' relationship with clients provides them with the information needed to monitor and police them. It is their role in producing information that makes banks indispensable in any modern economy. In this interpretation, the added value of PPI banks, by eroding the deposit base of real relationship banks, could be negative.

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Figures and Tables

Figure 1: Positioning of PPI banking

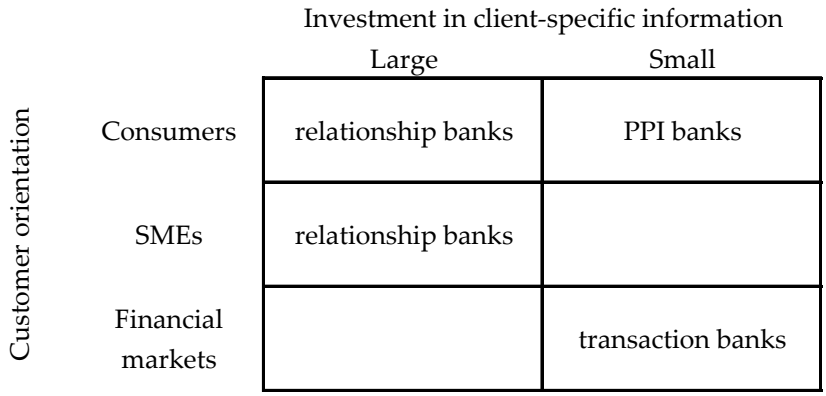
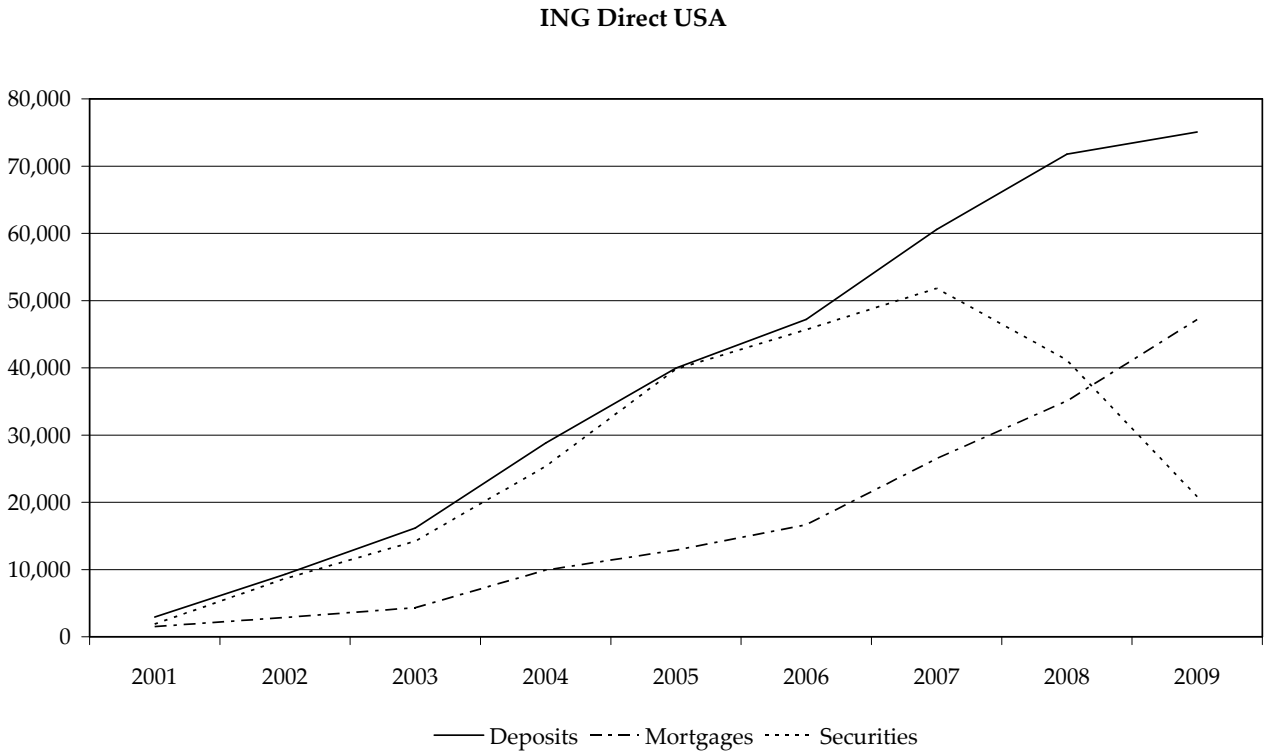


Figure 2: Scalability in four ING markets



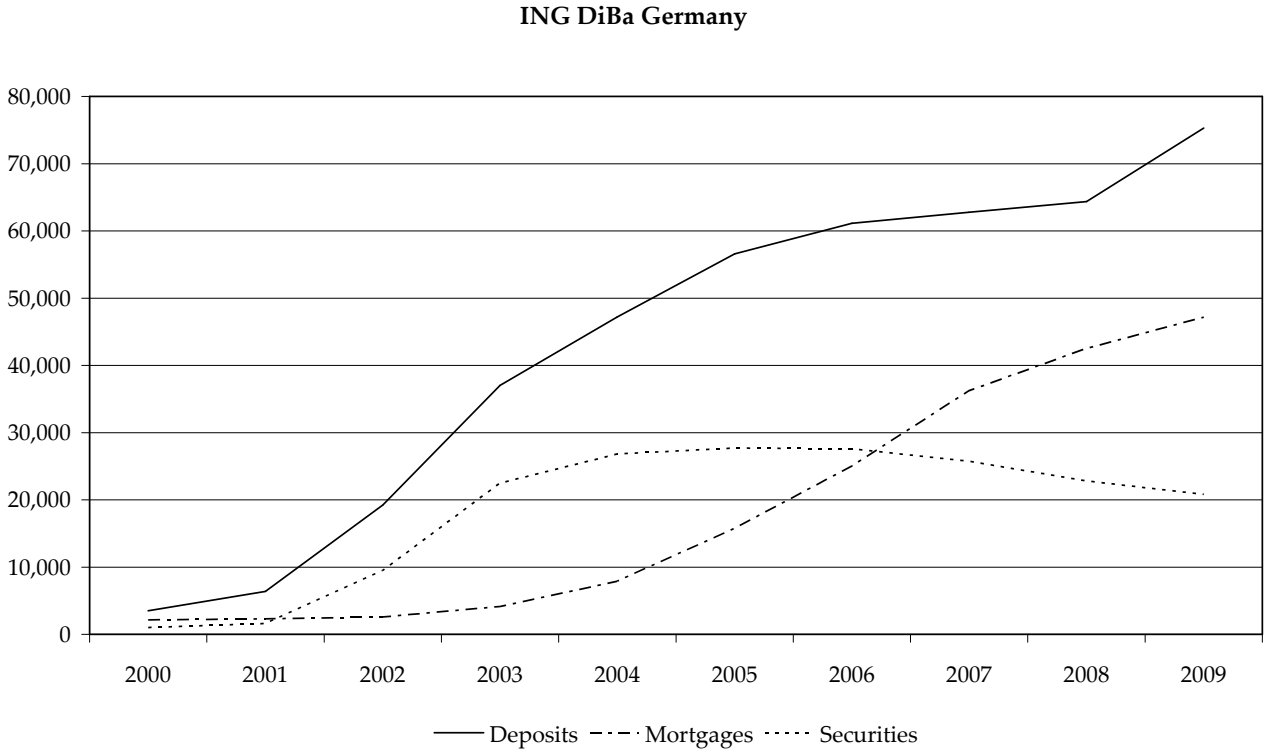
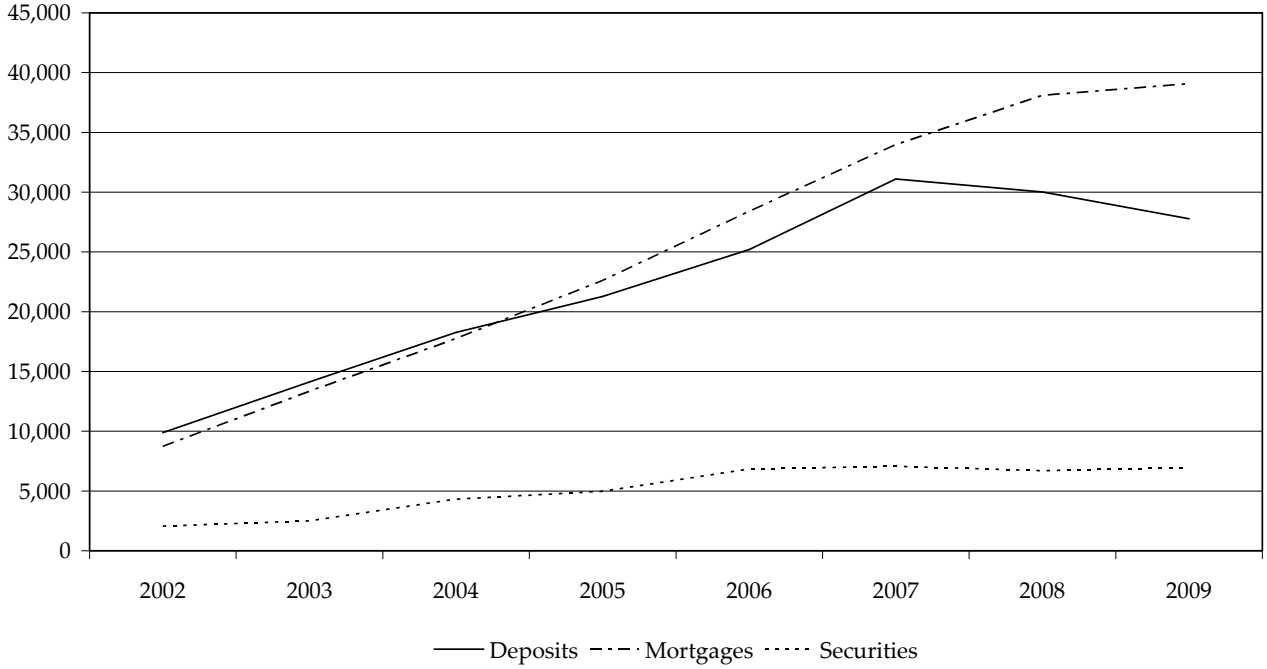


Figure 2: Scalability in four ING markets (continued)

ING Direct Australia



ING Direct Canada

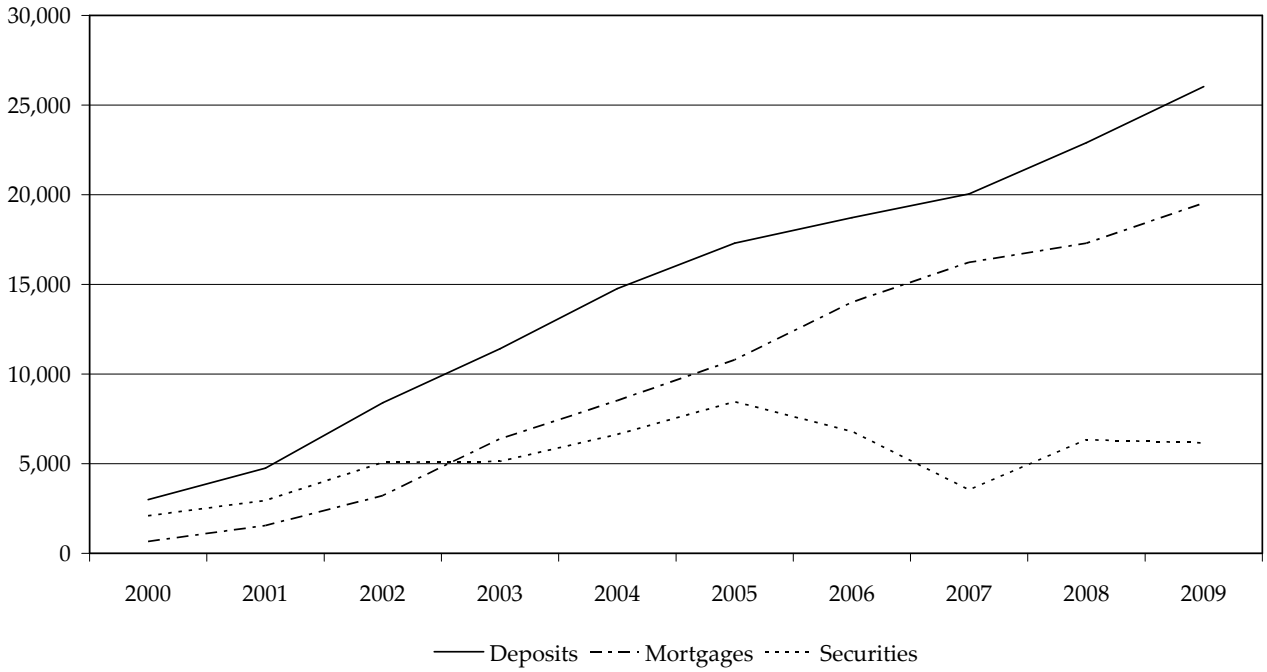


Figure 3: Scalability at E-Trade

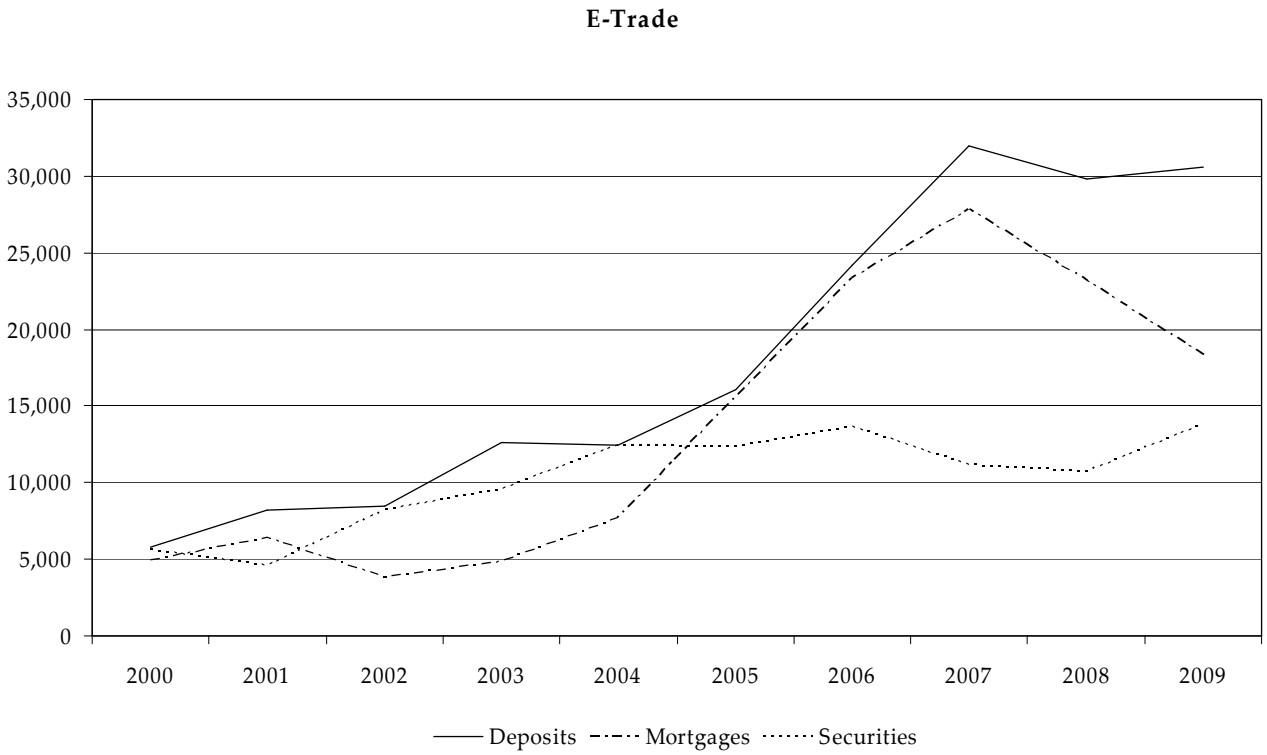


Figure 4: ING Direct UK savings rate versus country base rate

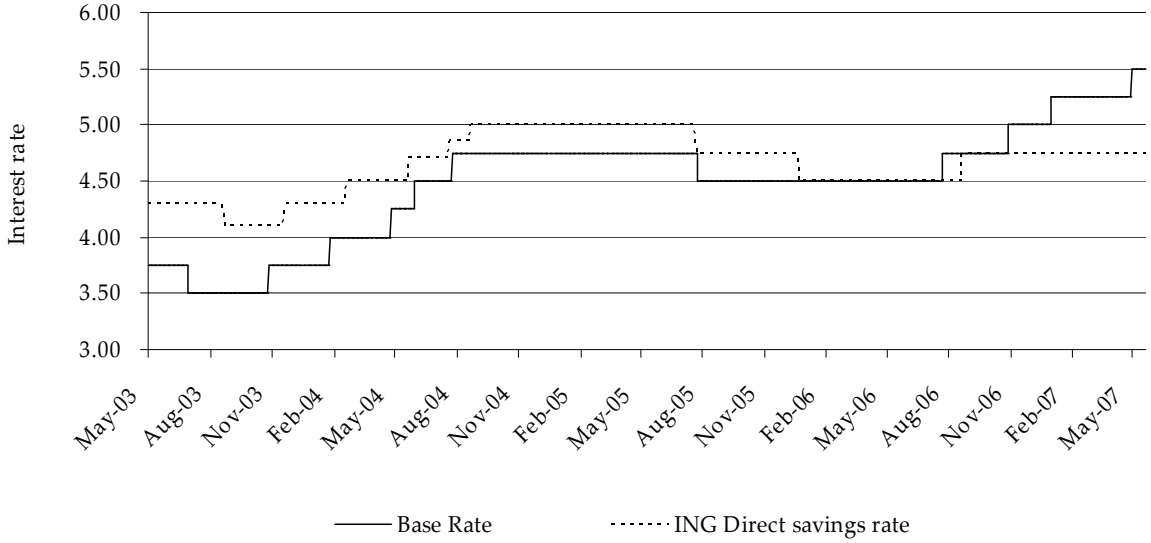


Table 1: Balance sheet data ING Direct, ING domestic operations, and E-Trade

	Germany		United States		Canada		Australia		UK	Spain	Italy	France	Netherlands		E-Trade	
(in millions)	EUR	%	USD	%	CAD	%	AUD	%	GBP	EUR	EUR	EUR	EUR	%	USD	%
Assets																
Mortgages	47,168	54	36,962	41	19,535	69	39,085	83	1,188	7,363	5,812	-	164,111	45	18,299	41
Corporate loans	0	0	479	1	126	0	0	0					122,096	33	144	0
Consumer loans	2,560	3	65	0	311	1	0	0					4,972	1	5,253	12
Securities	20,823	24	48,380	54	6,165	22	6,973	15					29,790	8	13,854	31
Other	17,195	20	4,407	5	2,105	7	1,042	2					45,643	12	7,487	17
Total assets	87,746	100	90,294	100	28,243	100	47,101	100					366,612	100	45,037	100
Liabilities																
Deposits	75,279	86	75,085	83	26,026	92	27,772	59	15,850	14,926	15,588	11,320	172,730	46	30,556	68
Equity	4,780	5	7,860	9	1,371	5	2,356	5					26,478	7	5,162	11
Other	7,687	9	7,349	8	846	3	16,972	36					178,920	47	9,319	21
Total liabilities	87,746	100	90,294	100	28,243	100	47,101	100					378,128	100	45,037	100

Note: Authors' calculations on the basis of various financial statements. All data are at year-end 2009.

Table 2: Panel unit root test, ING Direct

	statistic	p-value
secur/assets	-1.86	0.031
mortg/assets	-1.74	0.041
log(assets)	-10.54	0.000
dlog(hp)	-2.31	0.011
dlog(dep)	-7.67	0.000

Note: Levin, Lin & Chun (2002) panel unit root test; annual data 2001-2009; with automatic lag selection

Table 3: Scalability and deposit growth, ING Direct

Panel A: 2001-2009, 5 panel members

	secur/assets		*secur/assets*		*mortg/assets*		*mortg/assets*	
	coefficient	t-stat	coefficient	t-stat	coefficient	t-stat	coefficient	t-stat
intercept	-1.146	0.896	-0.452	0.751	1.580	1.601	0.321	1.595
dlog(dep)	0.127	2.774	0.184	2.602	-0.307	3.950	-0.271	4.422
dlog(hp)	0.063	0.515	0.067	0.411	0.228	0.812	0.041	0.046
log(assets)	0.134	1.139	0.048	0.886	-0.093	1.052	-0.011	0.629
lagged dependent			0.637	14.218			0.735	10.778
N	42		42		42		42	
Adj. R-squared	0.858		0.939		0.808		0.964	
p-value Bartlett test	0.465		0.567		0.576		0.051	

Panel B: 2001-2007, 5 panel members

	secur_assets		*secur_assets*		*mortg/assets*		*mortg/assets*	
	coefficient	t-stat	coefficient	t-stat	coefficient	t-stat	coefficient	t-stat
intercept	-1.817	1.688	-0.800	1.501	2.326	3.299	0.566	1.373
dlog(dep)	0.207	2.560	0.220	3.291	-0.392	4.519	-0.295	4.192
dlog(hp)	-0.137	0.717	-0.039	0.585	0.138	2.013	0.124	1.358
log(assets)	0.199	1.988	0.079	1.662	-0.167	2.534	-0.031	0.885
lagged dependent			0.671	10.809			0.675	10.739
N	32		32		32		32	
Adj. R-squared	0.875		0.955		0.874		0.967	
p-value Bartlett test	0.210		0.789		0.345		0.383	

Note: estimates include fixed cross-section and fixed period effects; White standard errors.

Table 4: Macro-economic environment

	Housing prices	Mortgage lending
Spain	39.1%	87.3%
Canada	38.3%	38.6%
France	31.4%	43.1%
United Kingdom	28.6%	41.6%
Italy	27.8%	61.8%
United States	25.2%	44.4%
Australia	18.9%	41.4%
Germany	-2.3%	1.1%

Note: cumulative growth rate over the period 2004Q1-2007Q2.

Table 5: Panel unit root test, E-Trade

	statistic	p-value
secur/assets	-0.628	0.265
mortg/assets	-0.665	0.253
log(assets)	-1.717	0.043
dlog(hp)	-3.861	0.013
dlog(dep)	-1.807	0.035

Note: Levin, Lin & Chun (2002) panel unit root test, except ADF test for dlog(hp); annual data 1993-2009; with automatic lag selection

Table 6: Scalability and deposit growth, E-Trade vs. US

Panel A: 1993-2009, 2 panel members

	secur/assets		*secur/assets*		*loans/assets*		*loans/assets*	
	coefficient	t-stat	coefficient	t-stat	coefficient	t-stat	coefficient	t-stat
intercept	0.834	7.738	0.683	22.155	0.191	3.534	0.138	6.976
dlog(dep)	0.086	3.678	0.075	2.445	-0.067	1.364	-0.037	2.171
dlog(hp)	0.158	1.287	0.127	1.034	0.019	0.197	0.069	1.647
log(assets)	-0.029	5.611	-0.024	29.241	0.018	6.158	0.009	1.440
lagged dependent			0.183	1.321			0.438	2.552
N	34		34		34		30	
Adj. R-squared	0.866		0.867		0.153		0.242	

Panel B: 1993-2007, 2 panel members

	secur_assets		*secur_assets*		*loans/assets*		*loans/assets*	
	coefficient	t-stat	coefficient	t-stat	coefficient	t-stat	coefficient	t-stat
intercept	0.822	9.218	0.709	9.038	0.095	4.513	0.049	21.150
dlog(dep)	0.071	3.015	0.072	3.732	-0.065	2.523	0.269	3.053
dlog(hp)	0.225	1.032	0.213	0.928	-0.179	0.804	-0.061	1.758
log(assets)	-0.028	7.457	-0.251	20.577	0.024	13.501	-0.114	0.619
lagged dependent			0.163	0.730			0.019	6.134
N	30		30		30		30	
Adj. R-squared	0.870		0.867		0.309		0.313	

Note: estimates includes fixed cross-section effects and uses EGLS due to cross-sectional heteroscedasticity;

Table 7: Interest rate sensitivity: ING Direct, E-Trade and US Banks

dependent variable: *d(intexp/liab)*

2001Q2-2009Q4	complete sample		upward change in *ffr*		downward change in *ffr*	
	coefficient	t-stat	coefficient	t-stat	coefficient	t-stat
intercept	-0.00014	2.781	-0.00025	2.660	-0.00030	3.299
d(ffr) - AI	0.394	6.525	0.299	1.795	0.334	3.565
d(ffr) - ING	0.430	7.122	0.694	4.170	0.311	3.323
d(ffr) - ETR	0.314	5.202	0.885	5.316	0.218	2.325
N	105		39		66	
Adj. R-squared	0.531		0.580		0.275	
p-value Wald test	0.381		0.039		0.649	

Note: pooled least squares with fixed cross-section effects; Wald test for null of equality of *d(ffr)* coefficients.

Table 8: Deposit funding sensitivity: ING Direct and E-Trade

dependent variable: *dlog(dep)-dlog(dep_ai)*

	2001Q3 2009Q4		2001Q3 2007Q4	
	coefficient	t-stat	coefficient	t-stat
intercept	0.673	1.921	0.679	1.225
d(intexpliab-intexpliab_ai)(-1)	13.054	2.677	16.536	2.356
dlog(dep)(-1)-dlog(dep_ai)(-1)	0.336	2.662	0.383	2.504
d(ffr)(-1)	-0.034	-1.532	-0.035	0.884
log(dep)	-0.038	-1.860	-0.038	1.175
dlog(hp_us)	0.584	1.176	0.495	0.629
N	68		52	
Adj. R-squared	0.433		0.377	

Note: panel estimation with 2 panel members and fixed cross-section effects.