Philippine Management Review (*Special Issue*) 2011, Vol. 18, 97-113.

Banking Industry Structure and Economic Activities: A Regional Approach for the Philippines

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This paper examines the link between banking industry structure and economic activity at the regional level in the Philippines. We apply a principal component analysis on regional banking and economic data for the period 1993 to 2005. We ranked the sixteen regions in three different groups depending on their average economic development. Our results show globally a positive link between regional indicators of economic development and banking development with a specific influence of rural banking mainly in the intermediate-developed regions, which is reinforced after the 1997 financial crisis. For the less developed regions, the more rural in the Philippines, commercial, thrift or rural banks do not seem to provide any significant contribution to economic development.

Keywords: financial development, regional economic development, banking industry structure, principal component analysis

1 Introduction

The link between financial development and economic growth has been the subject of extensive research in recent years, often anchored on the seminal works of McKinnon (1973) and Shaw (1973). Their influential work on financial liberalization laid the groundwork for the renewed interest in the role of financial intermediation in the economic growth process. The emergence of the endogenous growth theory shed a new light on the link between financial and economic development. Since King and Levine (1993a, 1993b) a large number of empirical studies have analyzed the finance-growth nexus for developed as well as developing countries (see Wachtel, 2003; Demirgüç-Kunt & Levine, 2008, for comprehensive surveys). While empirical studies used different methodologies to explore this nexus, they find overall consistent results on the sign of the relationship. Countries with better-developed financial system tend to grow faster[1]. However, existing empirical studies mainly focus on the influence of financial development on economic growth across countries, and therefore there is a need to control for institutional, social and political disparities. Moreover cross-country empirical studies are not able to capture the influence of banking system specificities on local economic development while country-level studies (Rodriguez-Fuentes, 1998; Collender & Shaffer, 2003; Valverde & Fernandez, 2004; Burgess & Pande, 2005[2]) show that small, regional and locally-owned banks may behave very differently from large, national and non locally-owned banks. Superior access to local information, greater commitment to local prosperity, differences in costs and risk management, and competition policy could explain the specific influence of such type of banks on local economic development. In developing countries where economic development is hampered by insufficient and inadequate access to financial services in rural areas, local banks could improve financing opportunities to small and medium size enterprises and favor entrepreneurship (Burgess & Pande, 2005; Kendall, 2009).

In this paper, we study the case of the Philippine regions. In this case, we can assume that macroeconomic conditions and political governance (i.e., monetary and exchange rate policies, banking regulations, education and health policies, industrial policies) are relatively homogeneous among all the regions as laws and policies are predominantly applicable to the entire country. The Philippines also has a bank-based financial system as evidenced by the limited presence of equity markets as source of finance (Gochoco-Bautista 1999) and mainly for large corporations. Hence funding for the majority of economic activities is expected to be sourced primarily from banks and

[1] A contentious area of research investigates the causality of this relationship. However, this question is beyond the scope of this paper.

[2] See Berger Hasan and Klapper (2004) for a survey.

not through financial markets (Gochoco-Bautista, 1999; Asian Development Bank, 2007). This leads us to concentrate on structural differences in the banking industry among regions in order to provide deeper insights into the finance-growth nexus.

In the Philippines, the formal banking system[3] is composed of three categories of banks: universal and commercial banks, thrift and private development banks, and regional rural and cooperatives banks. They differ primarily in terms of scope of activities. Commercial banks, which account for 57% of the total bank presence in the country[4] over the 1993-2005 period, have the same powers as thrift banks but can further act as an investment house and invest in non-allied enterprises. Thrift banks (18% of total bank presence) act as depository for individuals and government agencies, issue mortgages and extend credit. They also engage in quasi-banking and money market operations subject to the approval of the Bangko Sentral ng Pilipinas. Rural and cooperative banks (25% of total bank presence) promote the rural economy by providing local communities with basic financial services and credit facilities, aiding farmers through the stages of production, from buying seedlings to marketing of produce. Philippine banks are generally subject to common operational requirements including capitalization, limitations on single borrowers and shareholders, capital adequacy, and restrictions on bank branching.

In this paper, we aim to provide some insights on the correlation between economic activity and banking market characteristics at the regional level. To assess this question, we used principal component analysis in order to detect correlation between regional economic activity and regional banking industry structure indicators.

The paper is organized as follows: Section two briefly describes economic and banking regional characteristics of the Philippines, Section three presents our research design and the results, and Section four concludes the paper.

2 Economic Activity and Banking Industry Structure in the Philippine Regions

To assess the link between banking industry structure and economic activity in the Philippine regions, we use macroeconomic and regional banking data. The study period is from 1993 to 2005. Our dataset could not start prior to 1993 as the regions were organized differently then.

2.1 Regional economic activity

The Philippines is currently divided into seventeen geographic regions. For this study however, we refer to only sixteen regions, having integrated Region 4-A, Calabarzon and Region 4-B, Mimaropa (Region 4 was divided into two separate jurisdictions only in 2002).

Per capita real gross regional domestic product (Per Capita Real GDP) is used to rank the regions over the period covered by this study (Table 1). The ranking remains relatively constant whether the 1993 or the 2005 values are used as a reference. In view of the heterogeneity of the stages of economic development, we classify the regions into three groups: less developed, intermediate developed and developed regions.

We use the decomposition by economic sector of the real gross regional domestic product to analyze differences in the regional economic activity. This decomposition enables us to highlight for each region which economic sector provides the higher contribution to the per capita real domestic product. Per Capita Real GDP, Agri, Ind and Serv refer respectively to per capita real regional domestic product, per capita real regional added value in the agriculture, industry and services sectors.

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[3] In this paper, we do not aim to study the semi-formal and informal financial sectors. For a presentation of the financial system in the Philippines, see Dauner, Helms, and Deshpande (2005). For a detailed study of rural finance, see Llanto (2005).

[4] Bank presence here is measured by the banking office density which is equal to the number of bank offices per capita.

Table 1. Per Capital Real Gross Regional Domestic Product (Per Capita Real GDP) and the Decomposition per Economic Sector (Agriculture, Industry and Service)

	Per Capita Real GDP		Agriculture		Industry		Service	
	1993	**2005**	**1993**	**2005**	**1993**	**2005**	**1993**	**2005**
Developed regions								
NCR	879	1452	0	0	337	460	**542**	**992**
Northern Mindanao	516	619	**191**	164	139	207	186	**248**
CAR	373	586	75	56	**183**	**351**	115	178
Intermediate regions								
SOCSARGEN	293	482	95	**181**	**120**	159	79	142
Central Visayas	321	432	49	37	97	139	**174**	**256**
South Luzon	368	419	105	86	**139**	164	123	**168**
Western Visayas	288	417	95	84	67	121	**126**	**211**
Central Luzon	313	357	72	65	**124**	132	117	**161**
Davao	352	310	**141**	72	81	95	130	**143**
Less-developed regions								
Zamboanga Peninsula	258	280	**135**	106	43	55	81	**119**
Eastern Visayas	192	259	65	72	61	84	**67**	**103**
Ilocos	181	257	73	90	24	39	**84**	**128**
Cagayan Valley	188	240	**97**	93	21	42	69	**106**
CARAGA*	209	223	**80**	74	61	59	68	**90**
Bicol	178	210	68	42	34	51	**76**	**117**
ARMM	112	126	**61**	**64**	18	15	33	48

*Source: National Statistical Coordination Board; Real gross regional domestic product is expressed in millions of pesos at 1990 prices. * CARAGA figure corresponds to 1997.*

In 1993[5], there is a great heterogeneity between the regions regarding the sector that provided the main contribution to the real GDP (numbers highlighted in light gray in Table 1). Over the 16 regions, agriculture provides the higher contribution to wealth for six regions which are mainly the poorest ones. Industry and services provide the main contribution to wealth respectively for four and six regions.

In 2005, all regions (except ARMM, CAR and SOCSARGEN) drew their wealth from services (numbers highlighted in dark gray in Table 1).

2.2 Regional banking industry structure

Bank regional data were provided by the Central Bank of the Philippines. The Central Bank aggregates data at the provincial, regional and national levels. While commercial banks and thrift banks operate nationally, rural banks operate mainly at a regional level.

The formal banking sector is dominated by commercial banks which, over the 1993-2005 period, represent 56.8% of the total number of bank offices in the Philippines. The thrift banks represent 17.8% of the total number of bank offices and the remaining 25.4% of the total banking offices operating in the country are regional rural and cooperative banks.

[5] 1997 for CARAGA.

Table 2. Market Share Per Type of Banks in the Philippines 1993-2005

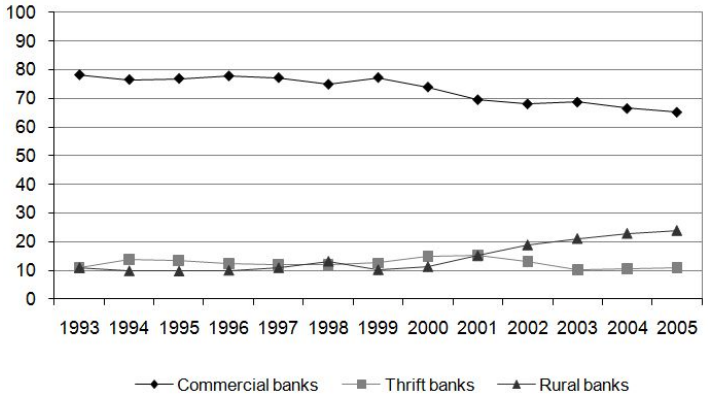
	Commercial banks	Thrift banks	Rural Banks
Banking office density	56.81 % *45.45 %*	17.81 % *16.96 %*	25.37 % *37.60 %*
Total resources	90.67 % *79.07 %*	7.77 % *12.05 %*	1.55 % *8.88 %*
Total net loans	89.13 % *73.12 %*	8.52 % *12.44 %*	2.34 % *14.44 %*

Numbers in italics are the market share computed for the group "All regions except NCR".
Source: Bangko Sentral ng Pilipinas

Commercial banks remain the major source of funding with an average credit market share of 89% and 73% when considering respectively the groups "All regions" and "All regions except NCR". However, at the national level, rural banks account on average for 25.4% of the total number of banking offices and granted 14.44% of the total amount of loans, when excluding the NCR over the 1993-2005 period. For this sub-sample, thrift banks have a lower banking coverage in terms of loan market share than rural banks (respectively 16.9% and 12.4%). Moreover, since 1998, Figure 1 shows a decline of the loan market share of commercial banks (from 77% to 65%) and thrift banks (12.60% to 11%) and, at the same time, a significant increase of the loan market share of the rural banks (from 11% to 24%).

When considering the different groups of regions, the market share of commercial banks is stable until 1999 and decreases after for all groups, with a 2005 value around 70% for developed and intermediate regions and around 60% for less developed regions (see Appendix Figure A1). This declining presence of commercial banks fully benefits rural banks in the three groups of regions, as the market share of thrift banks remains relatively constant – at nearly 10% for developed and intermediate regions and under 10% for less developed regions.

Figure 1. Loan Market Shares of Commercial, Thrift and Rural Banks in the Philippines* (1993-2005)



** Loan market shares are computed for the group "All regions except NCR".*
Source: Bangko Sentral ng Pilipinas

Deepening the analysis and focusing on the evolution of the level of total net loans per type of banks, we can see the immediate effect of the Asian crisis as a sharp reduction in total loans for all groups of regions and all types of banks from 1997 to 1999 (see Figure 1). However, after 1999, whereas total loans granted by commercial banks continued to decrease in intermediate regions, they remained stable in less developed regions. The increased market share of rural banks highlighted above can then be explained in the intermediate regions by the combination of a continual decreased influence of commercial banks and an increased presence of rural banks while in

less developed regions, this higher market share of rural banks is solely due to a sharp increase of loans granted by rural banks.

3 Empirical Analysis

3.1 Method

We use principal component analysis (PCA) in order to assess the link between economic and banking development at the regional level.

Principal component analysis is a variable reduction procedure used in exploratory data analysis which aims to detect some similarities/differences among a set of variables and to identify group of variables that tend to hang together empirically. This procedure is useful when you believe that there is some redundancy (correlation) in those variables. Unlike factor analysis, principal component analysis makes no assumption about an underlying causal model.

The first step is to extract components which are defined as linear combinations of optimally-weighted[6] variables. The first component extracted accounts for the maximum amount of total variance in the observed variables (the first component accounts for a fairly large amount of the total variance). The second component extracted has two important characteristics. First, it accounts for a maximal amount of total variance in the data set that was not accounted for by the first component. This second component will then be correlated with some of the observed variables that did not display strong correlations with component 1. Second, the second component is uncorrelated with the first component. This means that the information provided by this component is non-redundant with the one provided by the first component.

We apply principal component analysis to extract principal components from a set of economic activities and banking development indicators for the sixteen Philippine regions in order to detect to what extent those variables are linked together.

To measure economic activities, we use the indicators based on the decomposition of gross domestic product per economic sector: agriculture, industry and services.

Four different indicators are computed to measure the presence/influence of the three types of banks (commercial banks, thrift banks and rural banks) at the regional level: the share of total net loans over nominal regional gross domestic product (X_lg), the share of total deposits over regional gross domestic product (X_dg), the number of banking offices per capita (X_off) and the volume of total net loans (X_l), where X = CB, TB and RB refer respectively to commercial banks, thrift banks and rural banks.

An additional indicator of regional banking development, l/d, is also computed to measure local intermediation. This indicator is calculated for the whole banking industry and is equal to total net loans over total deposits.

We will conduct our analysis on the five following groups of regions: “All regions”, “All regions less NCR”, “Developed regions”, “Intermediate regions” and “Less developed regions”.

3.2 Results

For the whole sample of sixteen regions, the first two components explain 78.5% of the total variance. The quality of representation is very high (above 75%) for twelve variables and high (between 50% and 75%) for four variables (Table 3).

[6] These weights are optimal in the sense that, for a given set of data, no other set of weights could produce a set of components that are more successful in accounting for variance in the observed variables.

Figure 2. All Regions

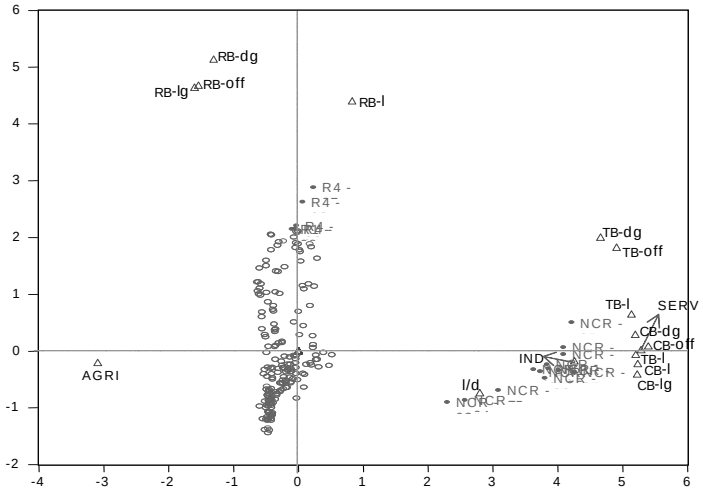


Table 3. Quality of the PCA Representation of Economic and Banking Indicators for the Samples All Regions and All Regions Less NCR

	All Regions			All Regions except NCR		
	Axis 1	**Axis 2**	**Quality**	**Axis 1**	**Axis 2**	**Quality**
Per capita real GDP						
Agriculture	-0.565	-0.038	0.321	-0.085	0.340	0.123
Industry	**0.777**	-0.033	0.604	0.275	0.347	0.196
Services	**0.964**	0.004	**0.930**	0.635	0.466	0.621
Intermediation						
Loans / Deposits	0.510	-0.135	0.279	0.114	0.536	0.300
Commercial Banks						
Deposits / GDP	**0.948**	0.053	**0.901**	0.607	-0.111	0.381
Loans / GDP	**0.954**	-0.075	**0.915**	0.430	0.508	0.443
Loans	**0.955**	-0.042	**0.913**	**0.812**	0.398	**0.817**
Per Capita Offices	**0.985**	0.015	**0.970**	**0.788**	0.413	**0.791**
Thrift Banks						
Deposits / GDP	**0.850**	0.365	**0.856**	**0.880**	-0.133	**0.793**
Loans / GDP	**0.937**	0.118	**0.892**	**0.781**	0.167	0.638
Loans	**0.949**	-0.012	**0.901**	**0.892**	0.061	**0.799**
Per Capita Offices	**0.895**	0.332	**0.912**	**0.920**	0.045	**0.848**
Rural banks						
Deposits / GDP	-0.238	**0.937**	**0.935**	0.606	-0.714	**0.878**
Loans / GDP	-0.292	**0.847**	**0.802**	0.465	-0.691	0.694
Loans	0.151	**0.803**	0.668	0.725	-0.410	0.694
Per Capita Offices	-0.282	**0.853**	**0.808**	0.709	-0.395	0.658

* *Bold and shaded numbers respectively highlight a quality of representation greater than 75% and greater than 50% (when the correlation is negative, numbers are outlined in a box).*

The first component (53.3% of the total variance) highlights a positive correlation between indicators of industry, service, commercial and thrift banks (on the right hand side of component 1). This whole set of variables is negatively correlated with the agriculture indicator (left hand side).

The second component (25.2% of the total variance) is exclusively and strongly driven by the four rural bank indicators.

This means that the sixteen (16) Philippine regions could be discriminated according to:

- a positive relationship between economic development, measured by the contribution of industry and services in the real gross domestic product, and banking development, measured by the presence of commercial and thrift banks; and
- an independent and significant influence of rural banking.

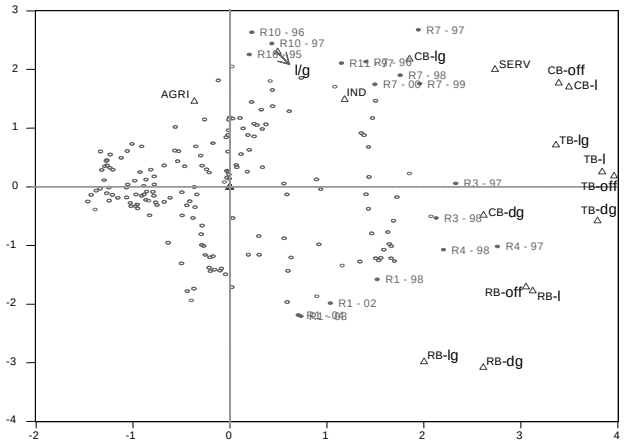
However, the National Capital Region (NCR) is clearly the explanatory factor of the first axis. In Figure 2, the outliers at the extreme of the right hand side are those of the NCR. Indeed, the NCR differs strongly from all the other regions by its wealth and the high level of its banking activities.

In this first analysis, the discrimination of the sixteen Philippine regions is nothing but the opposition between Manila and the rest of the country.

Table 3 provides some insights into the role played by rural banks. Our four rural bank indicators are not at all associated to the first component but they are strongly linked to the second one, in total contrast to the results obtained for commercial and thrift banks indicators. Nevertheless, Axis 2 shows no positive or negative link between rural banking and any other banking or economic indicators. We suspect that the weight of the NCR in the total variance, as mainly showed by the first axis, also prevents from any consistent residual discrimination among the other regions on the second axis.

We then exclude NCR. The explanation of the total variance by the first two components is reduced and equal to 60.5% (see Figure 3). The quality of representation is very high for six variables and high for five variables (see Table 3). The first component explains 43.6% of the total variance and the second component 16.9%. The analysis is not as straight forward as in our first graph.

Figure 3. All regions except NCR



As previously, the first axis shows a positive correlation between economic and banking development. However, over the three economic indicators, only services are significantly and positively linked to this first axis but now, all banking indicators, i.e. including rural banking, are significantly and positively associated to the first axis. Industry and agriculture do not contribute to the explanation of this first axis.

For the second axis, we can observe a negative correlation between the upper side rural bank indicators and the lower side commercial bank indicators as well as economic indicators (industry and service) whereas thrift banks do not provide any contribution to this component. This means that the information provided by these indicators allows us to distinguish the contribution of commercial and rural banks between regions.

This analysis over the fifteen regions shows that a first contribution is common to our all financial indicators but a second contribution differs between rural banks and commercial banks. So, the first axis discriminates the level of intermediation whereas the second axis discriminates the specific role of the most differentiated types of banks in the Philippine banking industry: commercial

banks on one side and rural banks on the other side. Our aim is now to address this question on the three sub-samples of regions we built using an economic development criterion: developed regions, intermediate regions and less developed regions.

For the sub-sample Developed regions, the first two axes show a very high 86.73% of total variance. Indeed, the quality of representation is very high for eleven variables and high for five variables (see Figure 4).

The core result is that the first component contributes to 76.87% of total variance which is seven times more than the second component. This first axis provides close results to those obtained for the whole set of regions. But, the rural banking indicators are no longer independent of the other banking and economic indicators. The rural indicators are now negatively correlated to the set of indicators that commonly identifies developed regions and positively correlated with agriculture.

A clear discrimination between NCR, the richest region, and the two other developed regions, Northern Mindanao and CAR, is the agriculture and rural banking indicators. In this case, the presence of rural banks is associated with a lower level of wealth.

Figure 4. Developed Regions

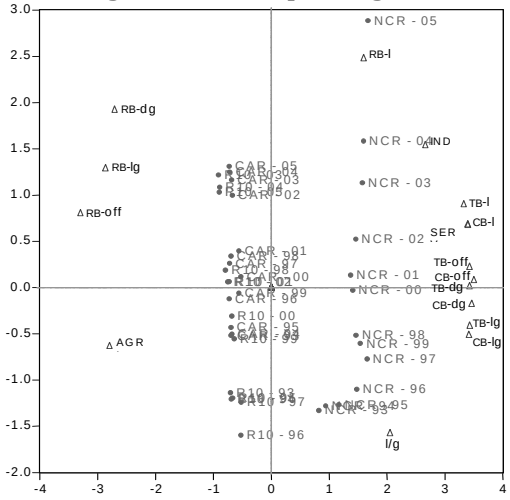
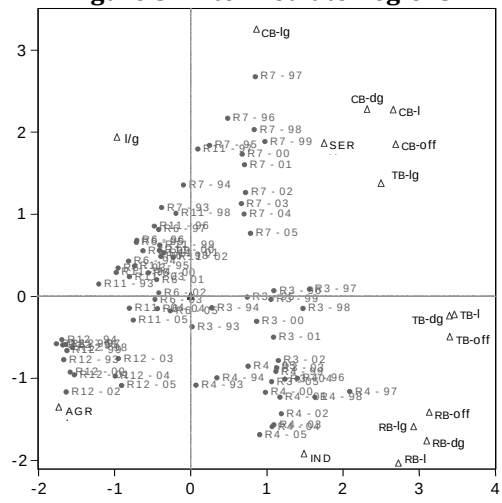


Figure 5. Intermediate Regions



When considering the intermediate regions, the representation of the first two components reaches 73.53% of total variance (see Figure 5).

The quality of representation is very high for nine variables and high for three variables (Table 4). The first component on the right-hand side represents all types of bank indicators, industry and service and on the left-hand side agriculture. The second component also explains some of the previous variables, more precisely, this axis shows a negative correlation between the upper side service and commercial banking indicators and on the lower side industry and rural banking indicators.

Contrary to developed regions, the presence of rural banks no longer identifies a relatively low level of wealth. It rather discriminates a path of economic development, and clearly appears if we consider a pre- and post-1997 crisis analysis (see Figures A2a and A2b and Table A1). Before 1997, gathering information given by the two axes, a clear evolution over time of all the regions of this group provides an understanding of their economic development: an extension of services mainly led by commercial banks and to a lesser extent an expansion of industry mainly led by thrift and rural banks. The 1998-2005 period tells us a different story in the aftermath of the crisis. Three groups of intermediate regions could now be distinguished (Figure A2). The first one is identified by a strong agriculture activity (SOCSARGEN, Western Visayas and Southern Mindanao), the economic activity of the second set is driven by services with a significant presence of commercial banks (Central Visayas) and finally, the last is characterized by industry-led activity and the presence of rural banks (Central and South Luzon). On the whole, the intensity of correlation between economic and banking development indicators highlighted by the two components is modified, stressing a crucial role of rural banks in this post-crisis period (Table A1). The influence of commercial banking seems to be reduced along with a less pre-eminent role of services in the economic development. Meanwhile, rural banks, less impacted by the crisis, expand their influence mainly towards industry and acquired a markedly differentiated position compared to commercial and thrift banks.

Table 4. Quality of the PCA Representation of Economic and Banking Indicators for the Samples Developed Regions, Intermediate Regions and Less Developed Regions

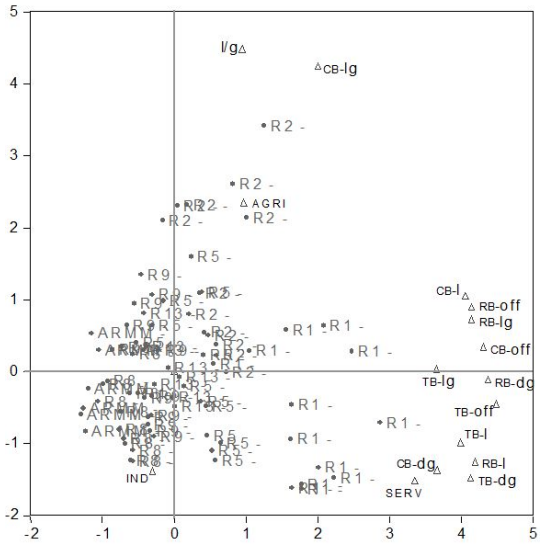
	Developed Regions			Intermediate Regions			Less Developed Regions		
	Axis 1	**Axis 2**	**Quality**	**Axis 1**	**Axis 2**	**Quality**	**Axis 1**	**Axis 2**	**Quality**
Per capita real GDP									
AGRI	-0.792	-0.179	0.660	-0.473	-0.370	0.361	0.198	0.480	0.270
IND	0.754	0.436	0.759	0.406	-0.526	0.441	-0.062	-0.283	0.084
SERV	**0.962**	0.192	**0.963**	**0**.479	0.509	0.489	0.687	-0.311	0.569
Intermediation									
Loans / Deposits	0.581	-0.446	0.536	-0.264	0.529	0.350	0.195	0.**919**	**0.882**
Commercial Banks									
Deposits / GDP	**0.980**	-0.049	0.**963**	0.632	0.622	0.787	0.751	-0.281	0.643
Loans / GDP	**0.967**	-0.145	0.**957**	0.236	0.**888**	**0.845**	**0**.411	0.**870**	**0.925**
Loans	**0.961**	0.194	0.**962**	0.726	0.620	**0.912**	**0.832**	**0**.214	0.738
Per Capita Offices	**0.992**	0.023	0.**984**	0.736	0.505	0.797	0.**883**	**0**.070	0.785
Thrift Banks									
Deposits / GDP	**0.970**	0.004	0.**941**	**0.928**	**-0**.066	0.**866**	**0.847**	**-0**.304	0.**809**
Loans / GDP	**0.971**	-0.117	0.**957**	**0**.683	0.375	0.608	0.748	0.007	0.560
Loans	**0.941**	0.255	0.**951**	**0.947**	**-0**.061	0.**901**	**0.818**	**-0**.204	0.711
Per Capita Offices	**0.970**	0.064	0.**944**	**0.930**	**-0**.136	0.**882**	**0.921**	**-0**.093	0.**856**
Rural banks									
Deposits / GDP	-0.767	0.545	0.**885**	**0.847**	**-0**.481	0.**948**	**0.896**	**-0**.023	0.**803**
Loans / GDP	-0.**812**	0.365	0.793	0.**800**	**-0**.435	0.**829**	**0.849**	**0**.149	0.744
Loans	0.452	0.702	0.698	0.746	-0.556	0.**865**	**0.859**	**-0**.257	0.**804**
Per Capita Offices	-0.**935**	0.228	0.**926**	**0.857**	**-0**.387	0.**884**	**0.848**	**0**.183	0.752

**Bold and shaded numbers respectively highlight a quality of representation greater than 75% and greater than 50% (when the correlation is negative, numbers are outlined in a box).*

When considering the poor regions, the first two components explain 68.34% of total variance (Figure 6). The quality of representation is very high for six variables and high for seven variables (Table 4). In the first component, we find a positive correlation between banking indicators and services, which is the only significant economic indicator. This set of variables is located on the right-hand side of this axis. Regarding the second axis, we no longer find any significant result of the banking industry structure on economic activities. The analysis does not show discrimination among

these regions, therefore, we can say that the profile of the poorest regions in terms of economic and banking development is relatively the same. Whereas such regions are the more rural ones in the Philippines (Table 1), rural banking does not play any specific contribution to economic development. Through time, all the regions display an increase of their financial intermediation degree and a decrease of their agriculture activities (see Figures A3a and A3b and Table A2). However this evolution is stopped by the 1997 financial crisis. Indeed, prior to the crisis, the less developed regions show some differences in their behavior (Table A2) but the post crisis analysis shows a homogeneous response of these regions.

Figure 6: Less Developed Regions



4 Conclusion

The principal component analysis conducted in this paper aims to provide insights on the influence of banking industry structure on economic development at the regional level in the Philippines. When considering the whole set of regions, two results are highlighted: (i) a positive link between indicators of economic development, driven by services and industry, and banking development, driven by commercial and thrift banks; and (ii) a specific and independent influence of rural banks. Analysis conducted on sub-samples allows us to take into account differences in the average level of economic development of the Philippine regions and to specify the impact of the banking industry structure and more specifically the role played by rural banks.

If data show a common influence of banking indicators, the negative correlation between commercial bank indicators and rural bank indicators on the second axis, which is obtained for all samples except the less developed regions one, highlights specific effects depending on bank types. For the more developed regions, the rural bank presence is negatively correlated with indicators that commonly identify wealthiest regions (services and industry) and positively correlated with agriculture, a result linked to the economic structure and the weight of the NCR. For the intermediate-developed regions, the presence of rural banks is no more associated with a lower level of wealth as it rather discriminates a path of economic development. Considering a pre- and post-1997 crisis, the influence of commercial banks seems to be reduced along with a less pre-eminent role of services. Less impacted by this crisis, rural banks expand their influence mainly towards industry and acquired a markedly differentiated position compared to commercial and thrift banks. For the less developed regions, the more rural in the Philippines, commercial, thrift nor rural banks do not seem to provide any significant contribution to economic development. We analyze these results as the existence of threshold effect that is, a minimum level of yield per capita is required for

banking and especially rural banking influence to be more effective[7]. Our study confirms the relevance of the sub-national level in the analysis of the finance-growth nexus as it allows us to consider a quite homogeneous macroeconomic and political framework for the whole Philippine regions and be more confident on the differentiated link between banking industry structure and economic development according to the level of economic development.

Acknowledgement

This paper was prepared for the ASIA-LINK human resource development project ASIALINK/B7-301/2005/105-139: Euro-Philippines Network on Banking and Finance, Safety and Efficiency of the Financial System, coordinated by the University of Limoges (http://asialink.philippines.googlepages.com). ASIA-LINK is a program of the European Commission that seeks to promote regional and multilateral networking among higher education institutions in Europe and developing economies in Asia. We would like to gratefully acknowledge the very useful help of V. Jalby on principal component analysis. All remaining errors are ours.

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Appendices

Figure A1. Loan Market Shares and Loans Per Type of Banks and Per Group of Regions in the Philippines 1993-2005

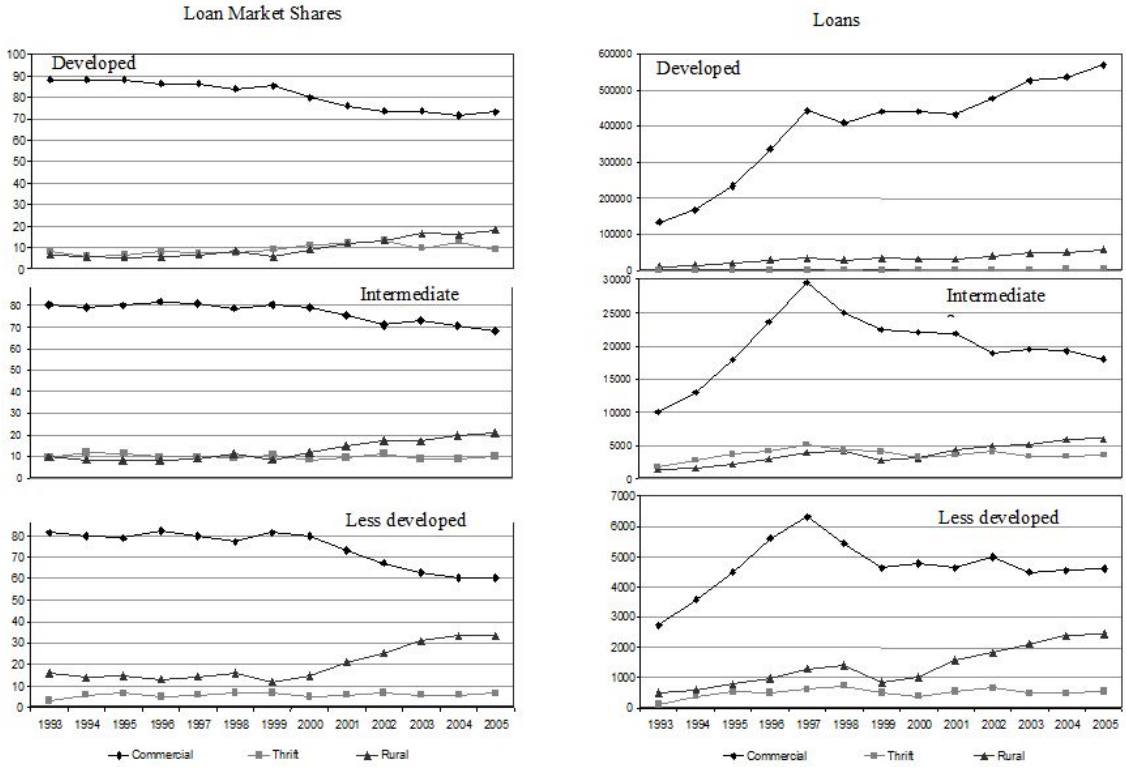

Figure A2a. Intermediate Regions 1993-1997

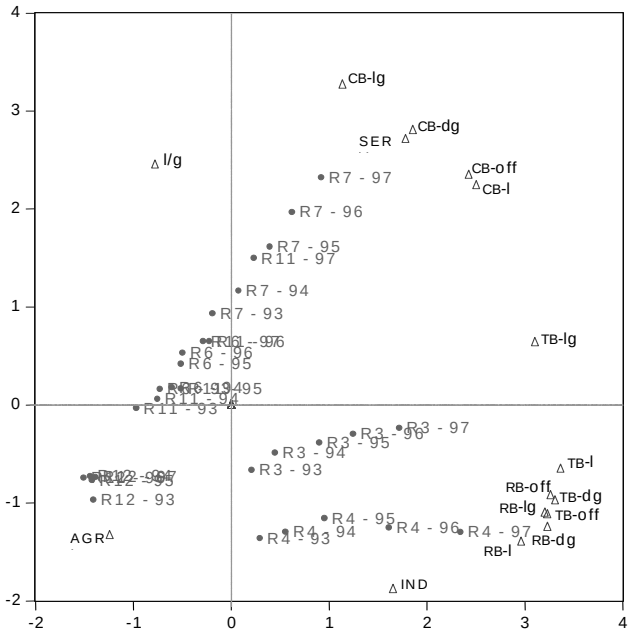

Figure A2b. Intermediate Regions 1998-2005

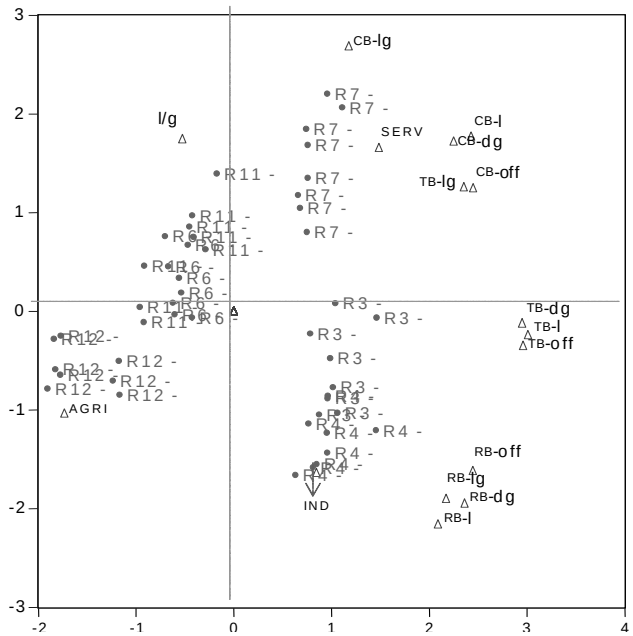

Figure A3a. Less Developed Regions 1993-1997

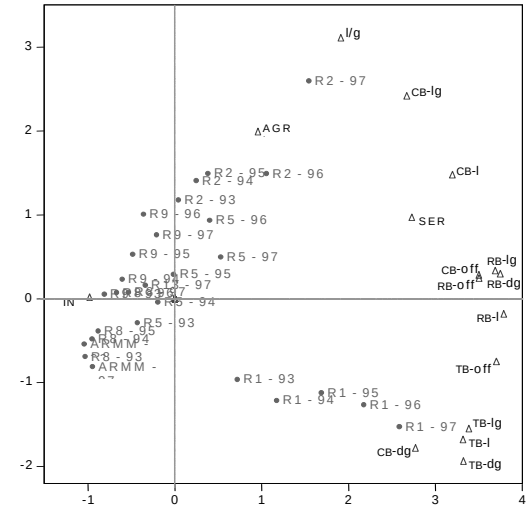

Figure A3b. Less Developed Regions 1998-2005

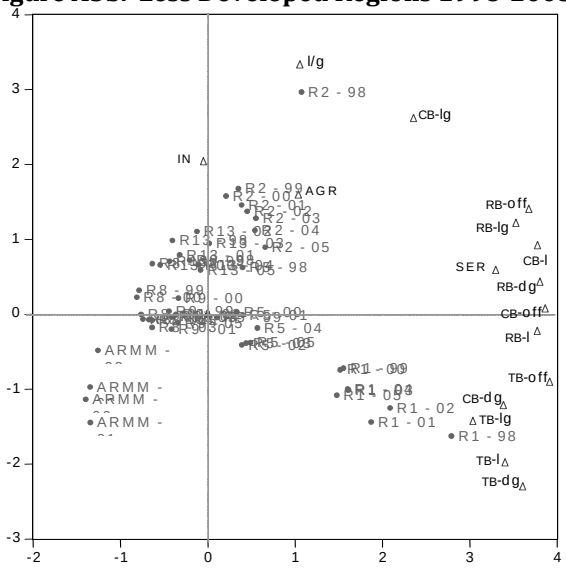

Table A1. Quality of the PCA Representation of Economic and Banking Indicators for the Sample Intermediate Regions Over 1993-1997 and 1998-2005 Sub-periods

Intermediate Regions	1993-1997			1998-2005		
	Axis 1	**Axis 2**	**Quality**	**Axis 1**	**Axis 2**	**Quality**
Per capita real GDP						
AGRI	-0.354	-0.378	0.268	-0.555	-0.331	0.418
IND	0.471	-0.536	0.509	0.270	-0.524	0.347
SERV	0.508	**0.773**	**0.856**	0.475	0.529	0.505
Intermediation						
Loans / Deposits	-0.222	0.699	0.538	-0.169	0.558	0.340
Commercial Banks						
Deposits / GDP	0.529	**0.800**	**0.919**	0.719	0.551	**0.820**
Loans / GDP	0.324	**0.932**	**0.973**	0.376	**0.859**	**0.879**
Loans	0.713	0.639	**0.917**	**0.777**	0.567	**0.925**
Per Capita Offices	0.692	0.669	**0.926**	**0.784**	0.399	**0.773**
Thrift Banks						
Deposits / GDP	**0.943**	-0.278	**0.967**	**0.943**	-0.039	**0.891**
Loans / GDP	**0.884**	0.183	**0.815**	**0.753**	0.402	0.728
Loans	**0.958**	-0.186	**0.953**	**0.963**	-0.077	**0.933**
Per Capita Offices	**0.919**	-0.318	**0.947**	**0.947**	-0.112	**0.909**
Rural banks						
Deposits / GDP	**0.920**	-0.354	**0.972**	**0.755**	-0.623	**0.958**
Loans / GDP	**0.912**	-0.314	**0.930**	0.694	-0.608	**0.851**
Loans	**0.843**	-0.398	**0.869**	0.668	-0.691	**0.923**
Per Capita Offices	**0.929**	-0.263	**0.932**	**0.782**	-0.517	**0.880**

**Bold and shaded numbers respectively highlight a quality of representation greater than 75% and greater than 50% (when the correlation is negative, numbers are outlined in a box).*

Table A2: Quality of the PCA Representation of Economic and Banking Indicators for the Sample Less Developed Regions Over 1993-1997 and 1998-2005 Sub-periods

Less Developed Regions	1993-1997			1998-2005		
	Axis 1	**Axis 2**	**Quality**	**Axis 1**	**Axis 2**	**Quality**
Per capita real GDP						
AGRI	0.244	0.509	0.318	0.238	0.365	0.190
IND	-0.251	0.003	0.063	-0.012	0.467	0.218
SERV	0.698	0.247	0.548	0.755	0.134	0.588
Intermediation						
Loans / Deposits	0.490	0.795	0.871	0.241	**0.763**	0.640
Commercial Banks						
Deposits / GDP	0.709	-0.457	0.712	**0.775**	-0.279	0.679
Loans / GDP	0.683	0.617	**0.848**	0.539	0.599	0.649
Loans	**0.818**	0.377	**0.811**	**0.865**	0.210	**0.792**
Per Capita Offices	**0.896**	0.072	**0.807**	**0.885**	0.016	**0.784**
Thrift Banks						
Deposits / GDP	**0.850**	-0.497	**0.969**	**0.826**	-0.528	**0.960**
Loans / GDP	**0.866**	-0.398	**0.909**	**0.695**	-0.327	0.591
Loans	**0.849**	-0.431	**0.907**	**0.779**	-0.454	**0.814**
Per Capita Offices	**0.947**	-0.193	**0.935**	**0.897**	-0.208	**0.847**
Rural banks						
Deposits / GDP	**0.959**	0.075	**0.925**	**0.871**	0.098	**0.768**
Loans / GDP	**0.944**	0.085	**0.898**	**0.808**	0.278	0.730
Loans	**0.969**	-0.048	**0.941**	**0.864**	-0.052	0.749
Per Capita Offices	**0.896**	0.062	**0.807**	**0.842**	0.321	**0.812**

**Bold and shaded numbers respectively highlight a quality of representation greater than 75% and greater than 50% (when the correlation is negative, numbers are outlined in a box).*