

Bank Branches Around The World

Claire Matthews*

Yiping (Anna) Ding

Centre for Banking Studies (PN205)

Massey University

Private Bag 11-222

Palmerston North

New Zealand

☎ +64 6 356 9099 Extn 2329

☎ +64 6 350 5651

✉ C.D.Matthews@massey.ac.nz

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Abstract

This study extends an earlier study looking at the number of bank branches in a country, and considering the factors that influence it. Fourteen countries are involved in this study, and the influencing factors considered are the number of ATMs and EFTPOS terminals, and the level of usage of these branch alternatives, as well as the economic development of the country as measured by GDP. We find that there is no evident relationship between the existence or usage of these alternative channels and the number of branches that exist in a country. However, we do find a relationship with GDP and on the basis of country groupings, suggesting country characteristics may be a key determinant of branch numbers.

* Corresponding author

(1) Introduction

Traditionally, a branch network has been a defining characteristic of a bank, having been seen as the best means of growing a bank. In recent years this has changed. Since the mid-1990s the number of bank branches has been reducing, and a range of alternative options have been made available for customer-bank interaction. In particular, banks now offer a range of channels to customers by which they can access the funds held in their accounts. These include ATMs, EFTPOS, telephone banking, and internet banking, as well as a variety of electronic payment types, such as direct credits and debits.

However, despite the growth of on-line banking and the pervasiveness of ATMs, and in New Zealand of EFTPOS, branches remain vital to bank growth (McDowall, 2003). The reality is that these newer channels support the branch, and together with the branch form a network of customer interaction that offers convenience to the customer and a competitive advantage to the institution (Mead, 1997). The continuing importance of the branch has been recognised by banks in New Zealand, as they have realised that in fact they went too far in reducing their branch networks and have begun to selectively extend them again, as shown in Figure 1.¹

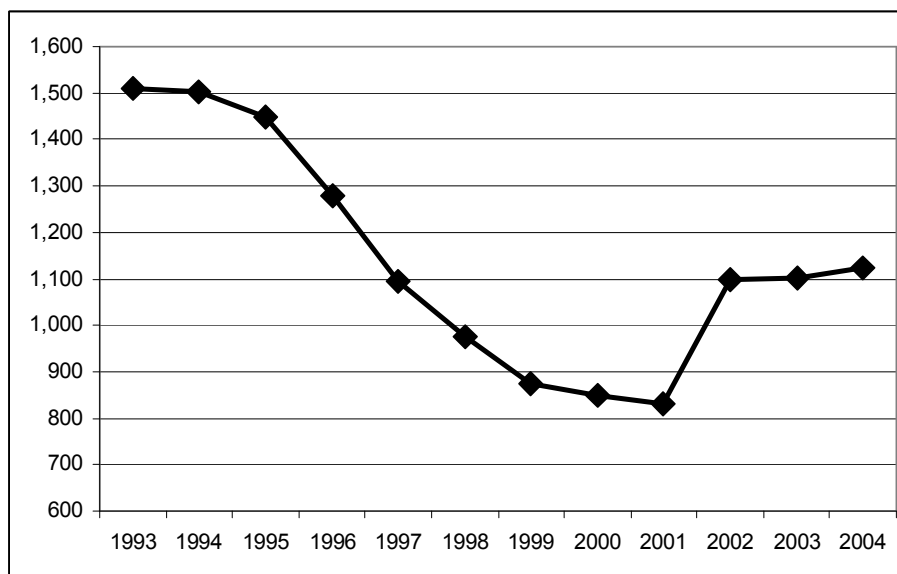


Figure 1: Bank branch numbers in New Zealand

At about the peak of the decline in bank branch numbers in New Zealand, in 1999, a study was undertaken comparing bank branch numbers in nine countries² (Matthews, 2000). The key focus of that study was the claims then made by the banks that the branch closures that were being undertaken reflected an overabundance of branches in New Zealand up to that point. The study

¹ The increase of nearly 300 branches in 2002 reflects the establishment of Kiwibank, which utilised the existing Post Office branch network to provide branches.

² The nine countries were: New Zealand, Australia, Japan, UK, US, Canada, Belgium, Switzerland and Sweden.

found that these claims were unfounded, and by some measures New Zealand appeared to have insufficient number of branches.

The study reported in this paper updates and extends the earlier study. It examines the trend in bank branch numbers in several countries around the world, and explores the relationship that exists between this trend and the existence of other channels in the market and of economic development of the country.

The following section explores prior work that has been done on branches and associated trends. Section 3 outlines the data collection process and the selection of the countries for the study. This is followed by the analysis of the data and discussion of the results, and then Section 5 concludes.

(2) Prior research

Between 1983 and 1992 the number of bank branches per million inhabitants declined in most developed countries (Aractingi, 1994), and data for 1996 confirmed the downward trend. Financial consolidation was a feature of the banking markets in the European Union during the 1990s, although cross-border mergers and acquisitions were rare, and this was accompanied by a reduction in bank branch numbers (Molyneux, 2003).

As noted above there was a nearly 45% decline in the number of branches in New Zealand in the period 1993 to 2001. Australia's experience mirrored that of New Zealand, with a reduction in bank branches through to June 2001 of 32% from the peak in 1993, followed by an increase to June 2004 of 3.5%.

By contrast in the US, in the period up to 1997, bank branches had increased by 25% while bank numbers had decreased by 40% (De Young, 1999), and this trend has continued, with steady growth in branch numbers and a steady decline in the number of banks up to the end of 2003 reported by Spieker (2004).

One of the key reasons for the decline in branch numbers was the recognition of the high costs associated with the branch delivery channel, which coincided with a tightening of banks' interest margins. The tightening of margins led to increasing emphasis on cost reduction to maintain and/or improve bank profitability. At the same time the appearance of the newer electronic channels provided less expensive and generally more convenient options for the customer, allowing the banks to argue that in fact customers were not disadvantaged by the branch closures. As Lane (2004) notes branches went out of fashion because people and buildings were thought to be too expensive.

More recently there has been an acknowledgement that branches are important because they provide an opportunity to make sales, which many of the other channels do not offer. A bank branch can also offer a wider range of financial services compared to the newer channels, which tend to be more restricted in terms of their offerings. Banks have brought services into the branch that traditionally were only available in regional or major centres, allowing more creative and versatile ways of promoting and delivering services such as executor, trust and taxation services (McDowall, 2003). As Brazel and Greene (2003) note, the branch network has always been the heart of a bank's franchise and revenue generating potential. The branch provides an opportunity for banks to grow their interest income, as well as their non-interest income. The recognition of the importance of the branch today, particularly in relation to sales, has seen a change in the layout such that the design of the modern bank branch is worlds apart from its traditional predecessor (Fung, 2001). For small business customers, the branch network offered by a bank, and the ease of access, has always been important (Stahl, 1995). Convenient access continues to be more important for retail customers, including SMEs, than for corporate customers.

The decline in branch numbers that has occurred in many countries is largely attributed to the growth of electronic banking transactions. One of the key advantages of the electronic channels is their 24/7 availability, compared to bank branches' relatively restrictive hours of operation of around 40 hours per week. This gives customers much more flexibility in terms of managing their personal finances, and eliminates geographical boundaries. Banks contributed to the switch from branches to the electronic channels by actively encouraging customers to use the electronic channels, and by the structure of their transaction charges, which made branches an expensive option for customers. Today many customers never go near a branch, and haven't done so in years. Such customers are happy to be charged to use a teller because they never do (Hitt and Frei, 1999).

And there is no question that customers accept the new electronic channels. In New Zealand, for example, EFTPOS has proven to be particularly popular, accounting for 37% of all non-cash transactions in 2004 with one terminal for every 41 people in the country as at 31 December 2004.

The relationship between financial and economic development was documented as early as 1969 according to Levine (1997). He concludes that "the emergence of financial markets and institutions affect – and are affected by – economic development" (p. 720).

Benston (2004) explored the specialness of banks and found that traditionally one of the reasons for banks' specialness has been the vital role they have played in the development and growth of economies. He suggests that savings and investment via banks have supported and enhanced economic development and growth in many countries.

(3) Data

The countries

This study utilises publicly available data for 14 countries. The 14 countries are New Zealand, Australia, Canada, Sweden, Belgium, Switzerland, Japan, United Kingdom, United States Singapore, Hong Kong, South Korea, France and Germany. In this section we will explain the choice of countries, as well as the variables used. Levine (1997) suggested that a diverse selection of countries would be needed to explore patterns between financial structures and economic development. It is intended that the countries selected for this study should represent a reasonable level of diversity.

New Zealand's inclusion is primarily due to it being the focus of the original study in 1999, as well as being the country of residence of the researchers. It is also of interest due to the way in which the population has embraced the use of EFTPOS for non-cash transactions. As Figure 2 shows there has been steady growth in EFTPOS transactions numbers, although growth in the EFTPOS share of total non-cash transactions has slowed.

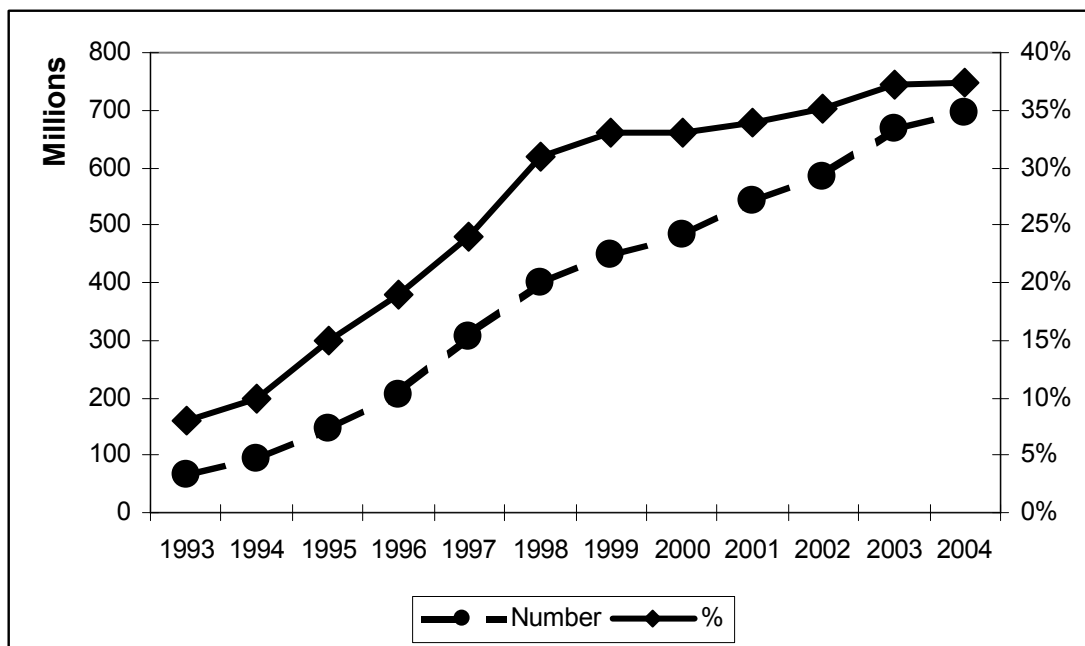


Figure 2: EFTPOS usage in New Zealand

As noted in Matthews (2000) "**Australia** is New Zealand's nearest neighbour, and the two countries are frequently compared" (p. 13). In addition, the New Zealand banking industry has a strong Australian influence with 88% of the industry being Australian owned as at 30th September 2005 (Tripe, 2006). The two countries also share a similar heritage, having both been colonised by the British in the 18th and 19th centuries.

One country with which Australia is frequently compared is **Canada**, which is included for that reason. Canada also has a strong British influence in its history. Like Australia it is a geographically large country with substantial areas that are sparsely inhabited.

Sweden is another country with which New Zealand is frequently compared, being of similar size. Sweden is also of interest as one of the Scandinavian countries, which are often seen to be different to other European countries; for example, Heffernan (2005) discusses the Scandinavian countries of Finland, Sweden, Denmark and Norway as a group separately to other parts of Europe. She also notes that there is a striking degree of concentration in the banking industry of the Scandinavian countries, which is also a feature of the banking industry in New Zealand.

Perceived efficiency accounted for the inclusion of both **Belgium** and **Switzerland** in the original study by Matthews (2000), which noted that both are relatively compact countries, with well-developed financial systems.

The other three countries in the original study were **Japan**, the **United Kingdom** and the **United States**. These three countries were included as the world's major economies, and possible role models. The United Kingdom is of particular interest because the New Zealand financial system has its origins in the British system. Both the United States and Japan are of interest because of the differences in their financial systems. In particular, the US financial services industry has historically been one of the most heavily regulated in the world, although some deregulation has occurred more recently. It is also of interest in this new study because, as noted earlier, it appears to have challenged the trend for declining branch numbers.

France and **Germany** have been included in this new study because they are the two largest EU economies, but not necessarily particularly efficient. They also operate under different legal, political and social structures, which could influence their respective financial industries.

Singapore, **Hong Kong** and **South Korea** were added to this study to broaden the Asian perspective. Singapore and Hong Kong are well developed economies, but significantly smaller than Japan. South Korea is less developed than the other three Asian nations included, but is making steady progress. Singapore and Hong Kong are also both extremely compact countries geographically.

The variables

The basic variable is the number of **bank branches** in the country. The bank branch is traditionally the primary channel for the population to access the funds they hold in bank accounts, although this is changing. As the earlier study found, some countries also have substantial numbers of branches of non-bank financial institutions, which generally offer similar services as the banks. In this study we are focussing specifically on the number of branches of banks to achieve

more direct comparability. The focus on bank branches also reflects the special nature of banks, including in terms of their role within the economy.

Another, now long-established, option for interacting with a bank, and particularly to obtain cash is the **Automatic Teller Machine (ATM)**. These have been in New Zealand since 1980, and longer in other countries. They are now relatively ubiquitous around the world. ATMs offer a cost effective means of providing extended access to customers' bank accounts, usually on a 24-hour per day, seven day per week basis. It offers a self-service alternative for customers to obtain cash and account balances etc, and thereby reduces the need for branches. ATMs are increasingly located off-site, i.e. at non-bank branch locations, which further loosens the customers' link to branches.

EFTPOS is also well established, having its beginnings in New Zealand in 1984, and in the 1970s in other countries. EFTPOS is primarily a payment alternative to cheques and cash, and reduce customers' need for branches by reducing their need for cash.

We also look at the number and total value of **transactions** through ATMs and EFTPOS, to indicate the level of usage of these alternatives to bank branches. It can be argued that it is more important to look at the use, rather than simply the availability, of these channels, as they will have little impact on branch numbers if they are not being used. Transaction values have been converted to US dollars to allow comparability between countries, using the exchange rates in the BIS red books where available. Exchange rates for the New Zealand and Australian dollars are from the Reserve Bank of New Zealand and Reserve Bank of Australia websites respectively.

Population is another factor used in this study, but not on its own. Rather population is used to enable better comparisons between the countries, which vary significantly in size, by eliminating the size effect. Numbers of branches, ATMs, and EFTPOS terminals are compared on the basis of the number per 10,000 people, which is a standard population size used for such comparisons, and is the ratio used in the 2000 study.

Economic development is measured using **GDP** on a per capita basis in US dollars. GDP is a standard measure of a country's economic health. Measuring it in US dollars and on a per capita basis eliminates currency effects and country size effects.

Data collection

The data has been collected for the period 1997-2002. The previous study used 1997 data, as the most recent available at the time, and this study includes all years up to 2002, being the most recent year for which data is generally available for the countries involved at the time of writing.

The data comes from a variety of sources. The GDP and population data is from the OECD, except for Hong Kong and Singapore which was obtained from the BIS. The branch, ATM and EFTPOS data comes from a variety of sources. Most comes from the annual red book publications of the Committee on Payment and Settlement Systems (CPSS) of the BIS. The New Zealand data is from the New Zealand Bankers Association, while the Australian data is from the Reserve Bank of Australia and the Australian Payments Clearing Association. The bank branch number data for Singapore comes from the annual reports of the Monetary Authority of Singapore.

The hypotheses

Banks around the world began emphasising the need to reduce costs in the 1990s, and closure of bank branches was seen as one of the main ways in which this could be done. At the same time electronic delivery channels, such as ATMs and EFTPOS, were seen as a good alternative for providing access to customers in more cost effective ways. This leads to the first two hypotheses.

H1: That the number of bank branches in each country has fallen since 1997, both in terms of absolute numbers and on a population basis.

H2: That the number of ATM and EFTPOS terminals in each country has increased since 1997, in both absolute numbers and on a population basis.

There is a general expectation that customers have found the electronic channels a convenient means of accessing the funds in their bank accounts. As a result they should be making less use of bank branches.

H3: That the number of branches is inversely related to the number of ATMs and EFTPOS terminals.

H4: That the number of branches is inversely related to the volume and value of ATM and EFTPOS transactions.

A more economically developed country can be expected to have more sophisticated customers who make better use of electronic channels.

H5: That the number of branches is positively related to the level of GDP.

Findings

Bank branches

Beginning with the number of bank branches we can see in Figure 3 that there is a mix in terms of the change in branch numbers. This graph shows the change between 1997 and 2002, which hides some of the variability within that time, but it does highlight the trends. In seven countries, the number of branches fell (Australia, Belgium, Germany, Japan, South Korea, Singapore and Sweden), while five countries (Canada, France, Switzerland, the UK and the US) had an increase in the number of branches. The average reduction was 21.4% against a 7.4% average increase. The largest fall was 46% in Sweden, while the largest increase was 10.5% in Canada. Hong Kong is not included in either group as no data was available for 1997; however, it had a reduction of nearly 7% between 1999 and 2002. New Zealand is also omitted from the two groups, as it essentially stayed static over this time, with a net increase of 4, or 0.37%; however, as seen in Figure 1 New Zealand did have a substantial reduction between 1997 and 2001 that was offset by the establishment of a new bank with a large network of branches in 2002. The average change was a reduction of 8.5. The overall change for these countries in total was a reduction of 5.6%, at least in part due to the reduction in two of the larger branch networks (in Germany and Japan).

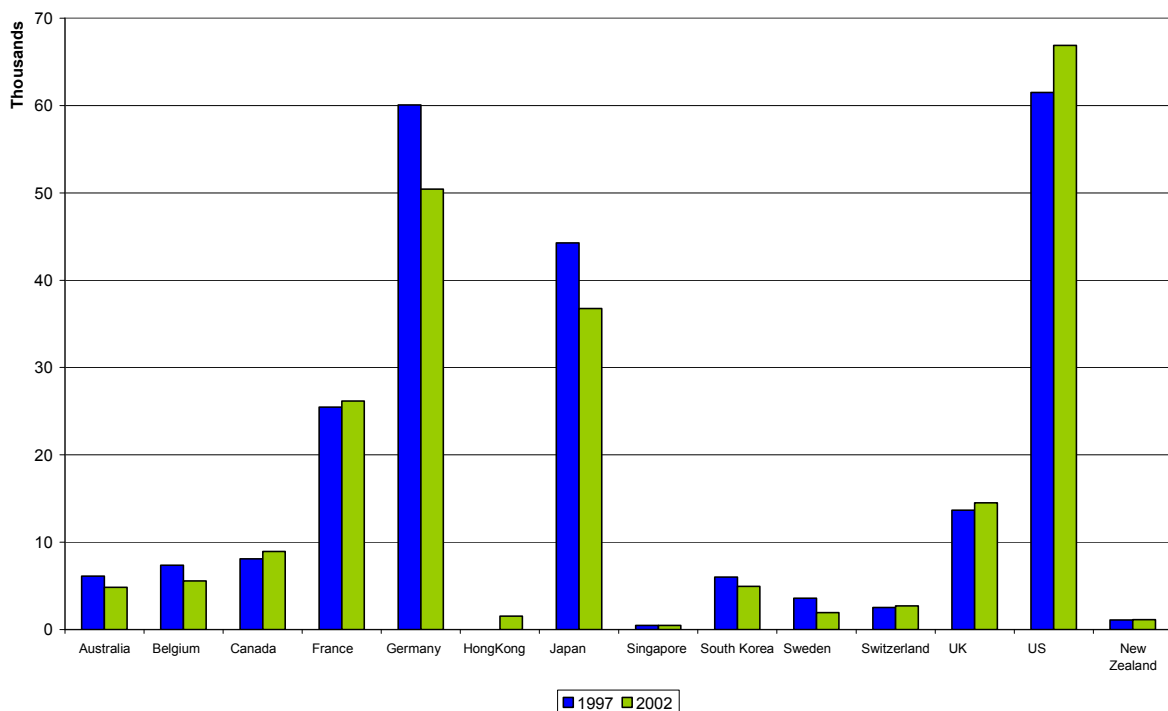


Figure 3: Number of bank branches

The trend for a reduction in branch numbers becomes more pronounced when looked at in population terms, as shown in Figure 4 with New Zealand being added to the countries with a reduction. As a result of the changes, Canada has moved from having the 9th highest proportion of branches in this group of countries in 1997 to having the 6th highest proportion in 2002. As before

no data is available for Hong Kong in 1997, but it had a reduction of 9.4% in the number of branches available proportional to its population between 1999 and 2002. The overall situation for these countries on a population basis is similar to that in terms of the absolute numbers, with an average reduction of 11.7% and a total reduction of 9.2%.

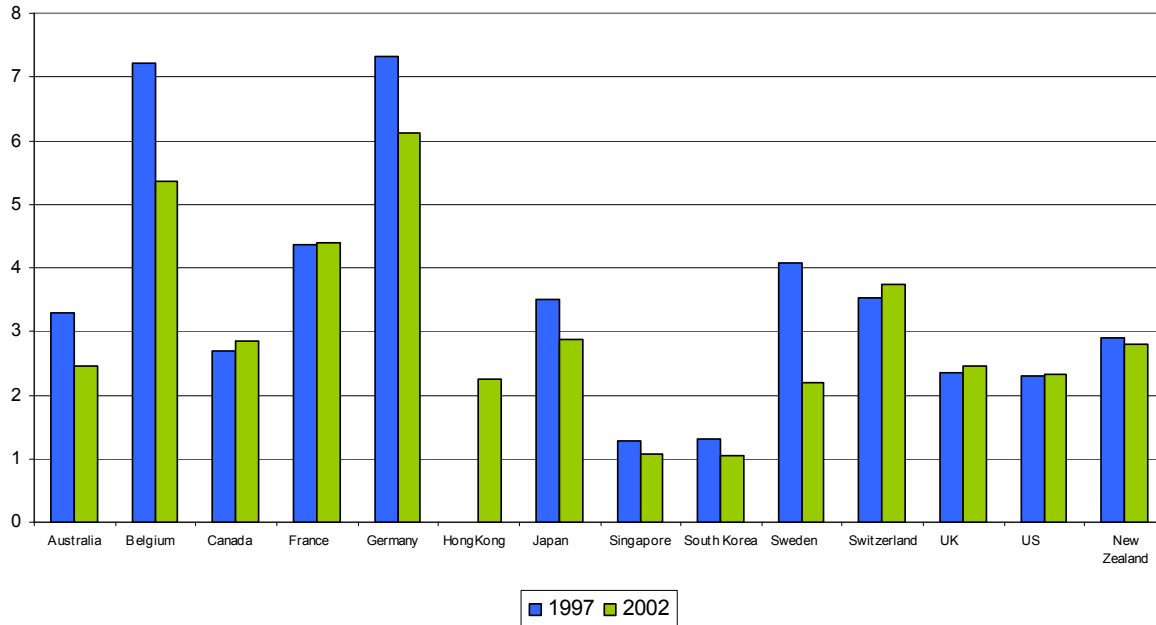


Figure 4: Number of bank branches per 10,000 people

ATM and EFTPOS terminals

As Figure 5 shows, the number of ATMs, on a proportional basis, has risen between 1997 and 2002 in all the countries except Japan and Singapore³. The increase ranged from 117.9% in Australia to 4.9% in Switzerland. The reductions in Japan and Singapore were 19.7% and 25.7% respectively. It is of interest to note that the only two countries to show a decrease were the two Asian countries for which this data was available. The results in absolute terms were similar.

³ No data on ATM numbers was available for Hong Kong and South Korea.

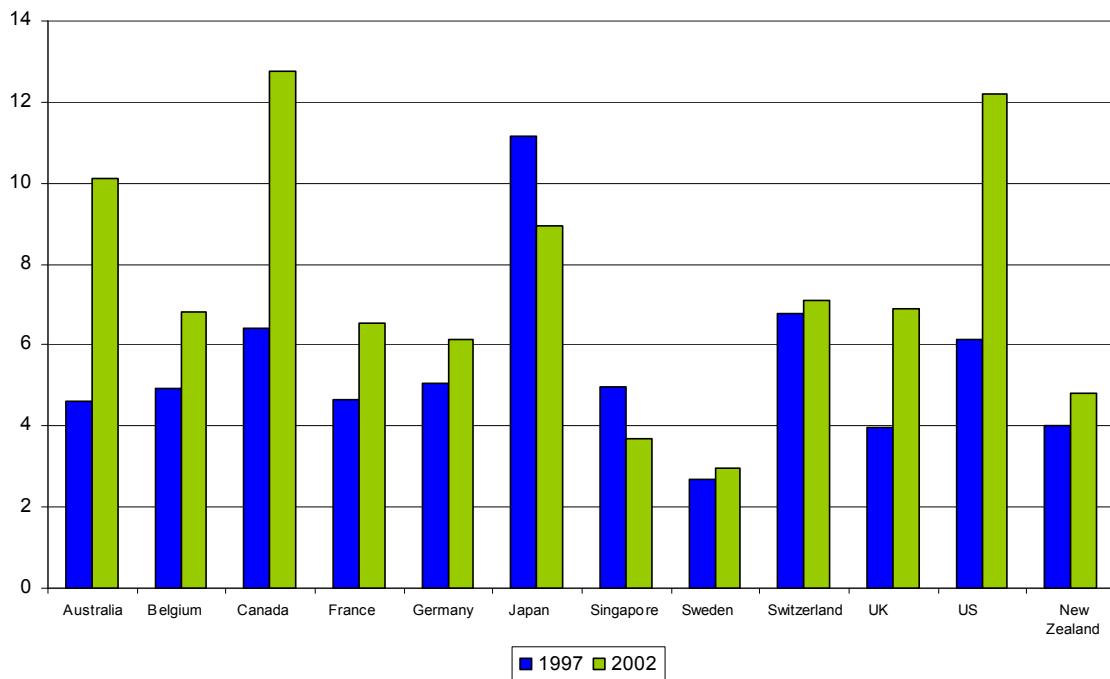


Figure 5: Number of ATMs per 10,000 people

When looking at the level of transactions, particularly on a per ATM basis, the reason for the reduction in Japan and Singapore becomes clearer. In Japan, the number of transactions per ATM fell from 4516 in 1997 to 3201 in 2002, while in Singapore the fall was from 8025 in 1997 to 5902 in 2002, at the same time as the number of ATMs has fallen. These are very low levels of use when compared to the 30,114 for the US in 2002, which is the next lowest. This suggests that the ATM is not a preferred channel for Japan and Singapore, and the banks are simply making the rational decision to reduce costs by removing unwanted access points. One possible reason for the reduced use of ATMs in these two countries is the traditionally more restrictive hours of operation for them, which have little more than opening hours of branches, unlike the 24/7 operation in most countries. There is now a move to increase the operating hours to be more similar to those found in other countries so this may impact on this trend.

As Figure 6 shows most of the other countries have a similar level of transactions at around 33,000 transactions per ATM per annum. However, the UK is slightly higher at 55,000, and New Zealand and Sweden are considerably higher at over 100,000 in each case. Most countries experienced a reduction in transactions per ATM between 1997 and 2002, with the exceptions being Belgium, Germany and Switzerland. Belgium and Germany experienced small increases, while Switzerland had a nearly 50% increase, but as Figure 6 shows this simply brought this countries more into line with the norm. The reduction generally reflects the fact that the number of ATMs available grew more rapidly than the usage level. Given this reduction in transactions on a proportional basis, the continued increase in the number of ATMs is surprising. And the level of use in New Zealand and

Sweden suggests there may be an opportunity to significantly increase the use levels in the other countries.

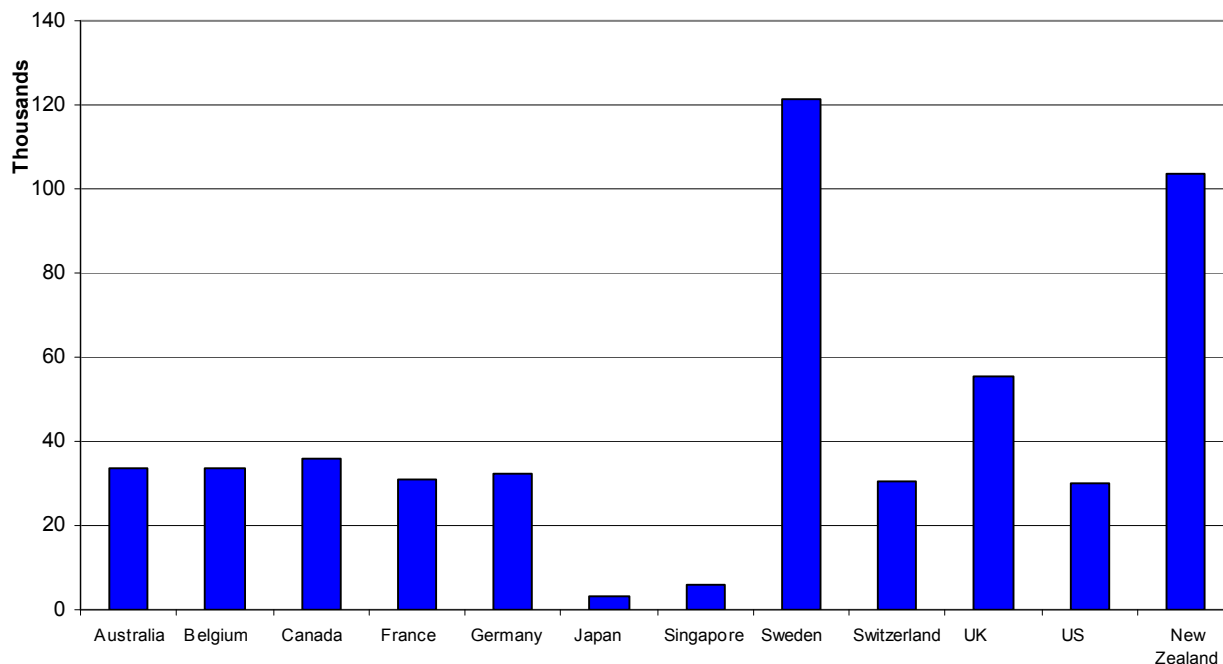


Figure 6: Number of transactions per ATM (2002)

The number of EFTPOS terminals available has been growing fairly consistently as shown in Figure 7, and all countries for which data is available have shown an increase between 1997 and 2002⁴. However, as can be seen in the graph, in several countries the rate of growth has slowed, and some have actually seen a slight reduction since 2000 or 2001. It is interesting to note that New Zealand had the highest number of EFTPOS terminals in 1997, yet managed to have the second highest increase in the number of terminals per 10,000 people, with a 52.5% increase, over this period. The change in absolute numbers reflected a similar pattern as shown for the proportional change.

⁴ Not data was available for South Korea and Hong Kong for any part of this period. Data for Japan was available for 1997 and 1998, but with only 1.56 and 1.27 terminals per 10,000 people in those years respectively there is no value in including them.

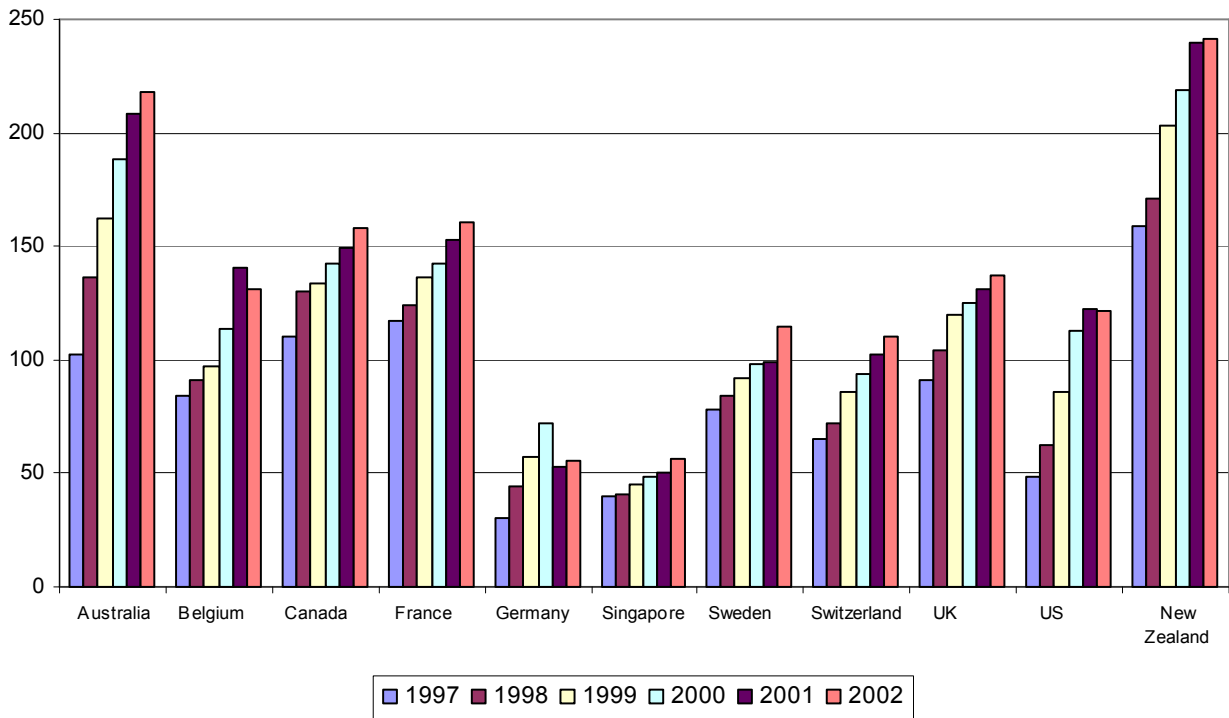


Figure 7: Number of EFTPOS terminals per 10,000 people (1997-2002)

The number of transactions has continued to grow for most countries. While Singapore had an increase between 1997 and 2002, as shown in Figure 8, it did have a small decrease between 2001 and 2002. New Zealand reached a peak of 6151 in 1998 before falling in 1999, but has since grown to almost return to that peak. New Zealanders have adopted EFTPOS with enthusiasm, particularly since 1993, using it for both purchases, and as a means of obtaining cash, as seen earlier (see Figure 2 on page 4). The exception to this growth is Australia, but this simply reflects that transactions over this period increased by 107.9% while terminal numbers increased by 126.3%.

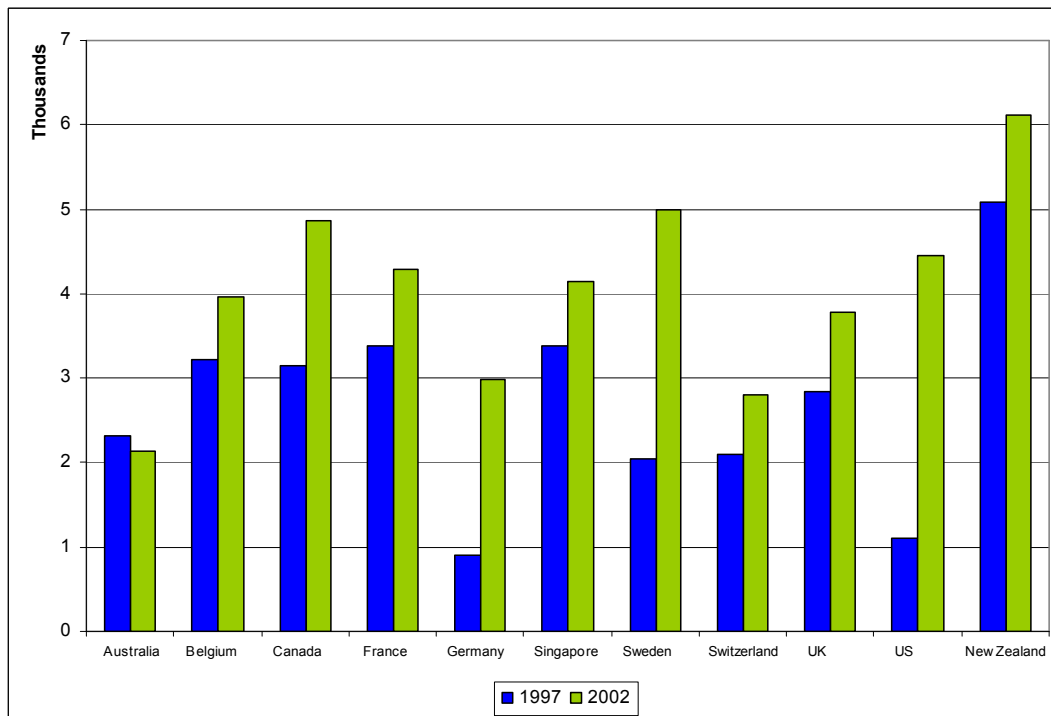


Figure 8: Number of transactions per EFTPOS terminal

Branches vs ATMs and EFTPOS

One way of looking at a pair-wise relationship is through looking at the correlation between the two variables. We can begin with looking at the correlation between the number of branches and the number of ATMs and EFTPOS terminals. Looking at figure 9 we find that there is almost no correlation between the number of branches and the number of ATMs on a population basis or between the number of branches and the number of EFTPOS terminals on a population basis. However, these results are not significant, so it is not really possible to reach any conclusion with respect to these relationships.

		Branches per 10,000 people	ATMs per 10,000 people	EFTPOS terminal per 10,000 people
Branches per 10,000 people	Pearson Correlation	1	-.079	-.137
	Sig. (1-tailed)	.	.255	.132
	N	82	72	68
ATMs per 10,000 people	Pearson Correlation	-.079	1	.077
	Sig. (1-tailed)	.255	.	.267
	N	72	72	68
EFTPOS terminal per 10,000 people	Pearson Correlation	-.137	.077	1
	Sig. (1-tailed)	.132	.267	.
	N	68	68	68

Figure 9: Simple correlation between number of branches, ATMs and EFTPOS

Looking at the relationship between the number of branches and the volume of ATM and EFTPOS transactions, we again find that there is no relationship. However, we do find a significant and moderately strong relationship between the volume of ATM and EFTPOS transactions, which is not particularly surprising given that the same card would be used for both, and people's willingness to use the electronic channels is usually general rather than focussed on one particular channel.

		Branches per 10,000 people	ATM transactions per 10,000 people	EFTPOS transactions per 10,000 people
Branches per 10,000 people	Pearson Correlation	1	-.189	-.066
	Sig. (1-tailed)	.	.057	.285
	N	82	71	76
ATM transactions per 10,000 people	Pearson Correlation	-.189	1	.644**
	Sig. (1-tailed)	.057	.	.000
	N	71	71	71
EFTPOS transactions per 10,000 people	Pearson Correlation	-.066	.644**	1
	Sig. (1-tailed)	.285	.000	.
	N	76	71	76

** . Correlation is significant at the 0.01 level (1-tailed).

Figure 10: Simple correlation between number of branches, ATM transactions and EFTPOS transactions

Figure 11 looks at the correlation between the number of branches that exist and the value of the ATM and EFTPOS transactions that are being undertaken. Again there is no relationship able to be identified. However, there is a significant and moderately strong relationship between the value of ATM and EFTPOS transactions, which supports the relationship found above in respect of the volume of transactions.

		Branches per 10,000 people	Value of ATM transactions per 10,000 people (US\$m)	Value of EFTPOS transactions per 10,000 people (US\$m)
Branches per 10,000 people	Pearson Correlation	1	-.058	.121
	Sig. (1-tailed)	.	.324	.158
	N	82	65	70
Value of ATM transactions per 10,000 people (US\$m)	Pearson Correlation	-.058	1	.617**
	Sig. (1-tailed)	.324	.	.000
	N	65	65	65
Value of EFTPOS transactions per 10,000 people (US\$m)	Pearson Correlation	.121	.617**	1
	Sig. (1-tailed)	.158	.000	.
	N	70	65	70

** . Correlation is significant at the 0.01 level (1-tailed).

Figure 11: Simple correlation between number of branches and value of ATM and EFTPOS transactions

Branches and GDP

		GDP	Branches per 10,000 people
GDP	Pearson Correlation	1	.236*
	Sig. (1-tailed)	.	.016
	N	84	82
Branches per 10,000 people	Pearson Correlation	.236*	1
	Sig. (1-tailed)	.016	.
	N	82	82

* . Correlation is significant at the 0.05 level (1-tailed).

Figure 12: Simple correlation between branch numbers and GDP

As we can see in the above table there is a significant, at the 5% level, but weak positive correlation between the number of branches and the GDP level of the country. This suggests that as the GDP level rises in a country, the number of branches also rises, but not at the same rate, which can be seen in the graph below.

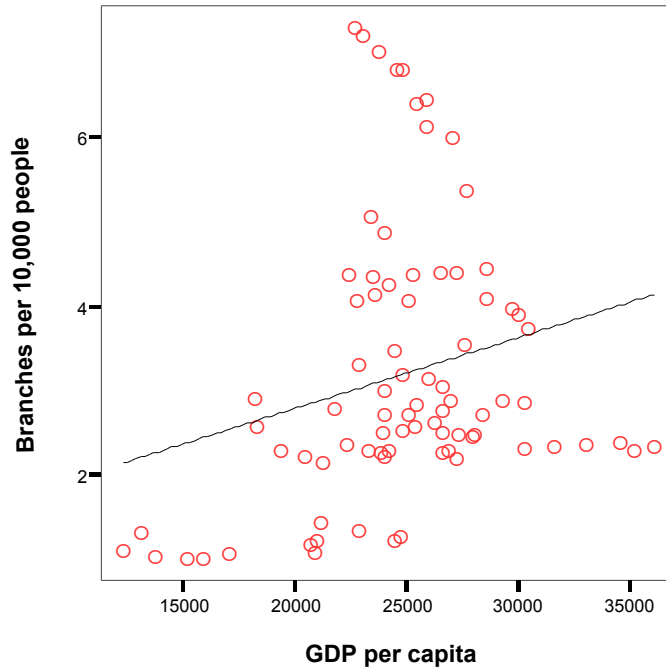


Figure 13: Plot of GDP against branch numbers

The countries in the study have been selected for both their differences and their similarities. On this basis, there is value in grouping the countries according to their similarities to see if they then show similarities in the number of branches.

Two groupings have been examined. The first is largely geographic, but groups the four countries with a strong British heritage together. The groups are:

- British – UK, Australia, Canada and New Zealand
- European – Belgium, France, Germany, Sweden and Switzerland
- Asian – Hong Kong, Japan, Singapore and South Korea
- US – US

As Figure 14 shows, there is a significant but weak correlation between the number of branches and the geographic region.

		Branches per 10,000 people	Region
Branches per 10,000 people	Pearson Correlation	1	-.216*
	Sig. (1-tailed)	.	.026
	N	82	82
Region	Pearson Correlation	-.216*	1
	Sig. (1-tailed)	.026	.
	N	82	84

*. Correlation is significant at the 0.05 level (1-tailed).

Figure 14: Simple correlation between number of branches and region

Exploring further we can examine the means, as shown in Table 15A. The means appear different, and this is confirmed by the ANOVA results shown in Table 15B.

Region	Mean	N	Std. Deviation
British	2.6050	24	.28677
European	4.8097	30	1.45556
Asian	1.8364	22	.87548
USA	2.3300	6	.03464
Total	3.1852	82	1.61434

Figure 15A: Mean number of branches for each region

		Sum of Squares	df	Mean Square	F	Sig.
Branches per 10,000 people * Regional dummy	Between Groups (Combined)	131.660	3	43.887	43	.000
	Within Groups	79.434	78	1.018		
	Total	211.094	81			

Figure 15B: ANOVA of regional means

An alternative grouping combines similar countries as below:

- Major economies – Japan, UK, and US
- Other Asian – Hong Kong, Japan, Singapore and South Korea
- NZ – New Zealand and Sweden
- Australia – Australia and Canada
- Other European – Belgium, France, Germany, and Switzerland

In this case we have combined the three major global economies of Japan, the UK and the US. New Zealand and Sweden are combined because they are seen as having similar economies and are frequently compared to each other. Australia and Canada are combined for similar reasons. As we can see in Figure 16 there is a strong correlation between the two variables at the 1% level.

		Branches per 10,000 people	Country group
Branches per 10,000 people	Pearson Correlation	1	.711**
	Sig. (1-tailed)	.	.000
	N	82	82
Country group	Pearson Correlation	.711**	1
	Sig. (1-tailed)	.000	.
	N	82	84

** Correlation is significant at the 0.01 level (1-tailed).

Figure 16: Simple correlation between number of branches and country group

The relationship can be explored further by comparing the means for each group, which appear in Figure 17A. The difference between the means is confirmed as significant by the ANOVA. The mean for the group of other Asian countries is quite low, at just 1.5 per 10,000 people. This group includes Hong Kong and Singapore, which are both extremely compact countries in geographic

terms, and substantially smaller than the other countries in the study. As a result they have very dense populations with over 6000 people per square kilometre, with the next highest being South Korea at just under 500, followed by Japan at 340. This contrasts with Australia and Canada at 2.6 and 3.1 respectively. It can be argued that as a result they need fewer branches on a per capita basis.

Country group	Mean	N	Std. Deviation
Global economies (UK, US, Japan)	2.5156	18	.49870
Other Asia (HK, Singapore, S Korea)	1.4669	16	.56634
NZ (NZ, Sweden)	2.8217	12	.79883
Australia (Australia, Canada)	2.7742	12	.23150
Other European (Belgium, Switzerland, France, Germany)	5.2204	24	1.25297
Total	3.1852	82	1.61434

Figure 17A: Mean number of branches for each country group

		Sum of Squares	df	Mean Square	F	Sig.
Branches per 10,000 people * Country group dummy	Between Groups (Combined)	158.338	4	39.584	57.78	.000
	Within Groups	52.756	77	.685		
	Total	211.094	81			

Figure 17B: ANOVA of group means

(5) Conclusion

We can now return to the original hypotheses to consider the results.

H1: That the number of bank branches in each country has fallen since 1997, both in terms of absolute numbers and on a population basis.

We began with an hypothesis that branch numbers have been falling around the world, but in fact the evidence on this was mixed. Certainly seven countries had had a reduction in the absolute number of bank branches; but on the other hand five countries had had an increase. On a proportional basis, relative to population, the results were similar with eight countries having had a reduction and five having had an increase. There is no obvious factor which can be used to separate the two groups in order to identify those whose branch networks increased or reduced. We must therefore reject the first hypothesis.

H2: That the number of ATM and EFTPOS terminals in each country has increased since 1997, in both absolute numbers and on a population basis.

The evidence with respect to ATM and EFTPOS numbers is clearer. In ATMs almost all countries had had an increase, with Japan and Singapore being the two exceptions. Both exceptions had

very low levels of usage of ATMs, providing the apparent reason for the reduction in those countries. All the countries for which data was available had had an increase in EFTPOS terminals between 1997 and 2002. However, both Belgium and the USA had had a slight reduction in both absolute terms and on a population basis between 2001 and 2002. Germany also had a reduction after 2000, for which no explanation is apparent. Hypothesis two is accepted, but with some caution, on the basis of the evident trend.

H3: That the number of branches is inversely related to the number of ATMs and EFTPOS terminals.

When we looked at the relationship between the number of branches and the number of ATMs and EFTPOS terminals, we found there wasn't one. It is therefore necessary to reject this hypothesis. This suggests that the reasoning behind the installation of ATMs and EFTPOS terminals, which has been primarily about reducing costs by getting customers to use less expensive channels, is flawed. There is no evidence that providing alternative and generally more convenient means of access for customers has allowed banks to reduce the size of the branch networks available to their customers.

H4: That the number of branches is inversely related to the volume and value of ATM and EFTPOS transactions.

The results in terms of the volume and value of ATM and EFTPOS transactions were similar, with no impact on the number of branches being evident. It is worth noting at this point that all the countries for which data was available had an increase in the number of EFTPOS transactions being done of at least 40% of the period of the study. In addition most countries had an increase in the number of ATM transactions being undertaken. Canada and the US both had a reduction in the number of ATM transactions, of 10.5% and 2.8% respectively. Japan and Singapore also had a reduction reflecting the relative dislike of that channel in those countries. This means that it cannot be argued that customers don't want these channels, and that is why they are continuing to use branches. It supports the argument that each new delivery channel simply adds a layer of cost, because customers start using the new channel without being prepared to relinquish their access to existing channels. Hypothesis four is also rejected.

H5: That the number of branches is positively related to the level of GDP.

We did find a significant relationship between GDP and the number of branches, although it was not a strong relationship it was positive. A relationship was also found in respect of country groupings, suggesting that there are country characteristics that influence the financial industry structure. This is particularly true as the grouping of similar countries showed a stronger

relationship than that of the regional groupings, although both were significant. This hypothesis can be accepted.

Future studies

It would be desirable to extend the study to include more countries, particularly more emerging economies, and possibly other Scandinavian countries. Further investigations of the country characteristics that influence the number of branches would also be useful. It would also be of value to explore whether the results change when looking at total branches, including those of non-bank financial institutions.

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