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The Impact of Bancassurance Regulatory Reform on Performance and Efficiency: A Case Study of Misr Insurance Holding Company (MIHC) in Egypt

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Abstract This paper looks at how regulatory changes affect bancassurance performance. We focus on one company - Misr Insurance Holding Company (MIHC) in Egypt. We compare two time periods: an unstable ”experimental” phase (2004–2013) when rules kept changing, and a more organized ”official reactivation” phase (2014–2020) after the 2013 Central Bank of Egypt rule. Looking at financial numbers and how the company operated, we found big differences between these two periods. In the first phase, MIHC’s returns were low - ROI was only 3.5% and profit-to-equity was 3.1%, both below what other companies were getting. After 2013, these numbers jumped to 19.04% and 29.43%. Administrative costs dropped a lot too - from 326% of premiums in 2004 down to about 14.13% later on. Our statistical tests (t-tests) showed real differences (p ¡ 0.05) in premiums, claims payments, number of policies, and total insurance amounts between the two periods. So having clear rules seems to help. But we should note - Egypt still just uses a ”distribution-only” model, not the deeper partnerships you see in places like France or Spain. Also, since we only studied one company, we can’t say these results apply to all Egyptian insurance companies without more research.

Keywords Bancassurance, Egyptian Financial Supervisory Authority (EFSA), Misr Insurance Holding Company (MIHC), Regulatory Reform, Distribution-Only Model, T-test Analysis, Data Envelopment Analysis, Interrupted Time Series Analysis

AMS 2010 subject classifications 91G05, 62P05, 91B30

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1. Introduction

Bancassurance in Egypt went through a major regulatory change that splits its history into two completely different parts. The first part started in 2004. Back then, nobody really knew what the rules were or how things were supposed to work. The Central Bank of Egypt (CBE) got worried about protecting customers and having clear rules, so they stopped most activities. This went on for about ten years [1, 2, 3, 4, 5].

Let me explain this more clearly. When bancassurance first started in Egypt around 2004, everyone was excited. Banks thought they could make extra money by selling insurance. Insurance companies thought they could reach more customers without paying lots of agents. But the problem was that nobody had written down the rules. How should customer data be shared? Who handles complaints? What happens if a bank employee gives wrong advice? These questions had no answers.

So the Central Bank of Egypt stepped in and said ”stop.” They froze everything. For about ten years, the whole thing was stuck. Some companies that had already started could keep going, but no new ones could join. This created a weird situation where bancassurance existed but couldn’t grow.

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Then came the second part - what people call the ”official reactivation” phase. Around 2013, the CBE and the Financial Regulatory Authority (FRA) decided to let things start again. But this time they wrote down the rules first. They figured out how things should work - who does what, who is responsible for what, how to handle problems. This changed everything.

Companies started doing better because they knew what was expected of them. This matches what we see in other countries too. When rules are clear, bancassurance works better. When rules are vague or missing, things fall apart [6, 7].

1.1. The Importance of Bancassurance for Insurance Companies

Life insurance companies always want to work more efficiently. They want to spend less money to get more customers. Bancassurance helps with this because you can use bank branches instead of paying lots of agents. Think about it - banks already have branches everywhere. They already have customers coming in every day. Why not sell insurance to those customers?

Research from other countries shows this really cuts costs [8, 9, 10]. Instead of sending agents door-to-door or calling people at home, you just put brochures in bank branches. Instead of paying commissions to agents, you pay fees to banks. It’s supposed to be cheaper.

But here’s the catch - at the beginning, costs are usually high. Nobody knows what they’re doing yet. Processes aren’t standardized. People make mistakes. Systems don’t talk to each other. So the first few years of bancassurance often look bad on paper. High expenses, low profits, lots of confusion.

Over time, as everyone figures things out, costs come down. Processes get smoother. Systems get integrated. People get trained. This is what we expected to see in Egypt. But we didn’t expect the rules to be suspended for ten years. That threw everything off.

1.2. The Egyptian Distribution-Only Model Explained

In Egypt, banks just sell the insurance products. They don’t actually handle the insurance part like underwriting or claims. All the technical stuff is done by the insurance companies themselves. So it’s really just a ”distribution-only” model.

Some researchers call this a ”Distribution Agreement” [11, 12, 13]. It’s the simplest form of bancassurance. The bank is just a sales channel. The insurance company does everything else.

This is different from what you see in France or Spain. In those countries, banks and insurance companies sometimes form joint ventures. They create new companies together. Sometimes they even merge completely. That’s called ”integration.”

Egypt is not there yet. We’re still at the basic level. That doesn’t mean it’s bad - it’s just different. But we need to be clear about what we’re studying. We’re studying distribution efficiency, not full bancassurance integration.

1.3. Case Study Selection Justification

We picked Misr Insurance Holding Company (MIHC) for this study because they’re a big player in Egypt. They’ve been around for a long time. They have good data. And they were one of the companies that continued operating during the suspension period.

Looking at their numbers, we can see that after 2013 they started doing much better. Before that, they were kind of average or below average compared to the market. After the rule change, they beat the market on things like ROI and profits.

But we need to be careful. This is just one company. We can’t say that every insurance company in Egypt did the same thing. Maybe MIHC was special. Maybe they had better management. Maybe they got lucky. That’s why we call this a ”case study” - we’re studying one case in depth, not making claims about everyone.

1.4. Research Scope and Objectives

So what are we trying to do here? Basically, we want to see how regulatory changes affected MIHC's performance. We want to compare the before period (2004-2013) with the after period (2014-2020). We want to see if things got better, and if the improvement was big enough to be real (not just random chance).

But we need to be honest about what this study can and cannot do. It cannot prove that the regulatory change caused the improvement. There were other things happening too - the 2008 global financial crisis, the 2011 Egyptian revolution, changes in interest rates, etc. Any of those could have affected MIHC's performance.

What we can do is describe what happened, measure the differences, and test whether those differences are statistically significant. We can also try to control for time trends using methods like ITSA. But with only 17 years of data, our statistical power is limited. So we need to be humble about our conclusions.

We're using regular financial numbers to measure performance - nothing fancy. We're not using Balanced Scorecard because we don't have the right data for that. We have financial data, but we don't have customer satisfaction surveys or employee training records. So we stick with what we have.

We've organized things. Section 2 reviews the existing literature on bancassurance around the world. Section 3 explains our data and methods. Section 4 presents our main empirical results. Section 5 shows the Data Envelopment Analysis results. Section 6 presents the Interrupted Time Series Analysis results. Section 7 discusses the findings and their implications. Section 8 concludes with policy recommendations.

2. Literature Review

This section reviews what other researchers have written about bancassurance. We start with how it started globally, then look at differences between countries, then focus on Egypt. At the end, we identify gaps in the literature that our study tries to fill.

2.1. The Origins of Bancassurance in France

France is really where bancassurance started. In the 1980s, French banks started selling insurance products. At first, people thought it was weird. Banks are for banking, insurance companies are for insurance. Why mix them?

But it worked. French customers liked buying insurance from their bank. They trusted their bank. They were already going to the bank anyway. So buying insurance there was convenient.

By 2010, French banks were selling 60% of all life insurance in France. That's huge. They also sold about 42% of general insurance (car insurance, home insurance, etc.) [14].

Why did France succeed? A few reasons. First, the regulations allowed it. Second, French banks had a lot of branches. Third, French customers were comfortable with it. Fourth, insurance companies were willing to partner with banks.

Other European countries followed. Spain, Italy, Portugal, Belgium - all developed bancassurance markets. But each country did it a little differently.

2.2. Bancassurance Development in Spain

In Spain, bancassurance started when Banco de Bilbao bought a chunk of Euros Guros SA. That was in the 1990s. Now the big players are Vida Caixa, BBVA, SCH, Mapfre Vida, and Seguro's Saval [24, 25, 26].

Spain has a mix of models. Some are distribution agreements, like Egypt. Others are joint ventures. A few are fully integrated. The Spanish market is more mature than Egypt's, but less integrated than France's.

2.3. Bancassurance in Belgium and Other European Countries

Belgium got started in 2004. The first insurance company AG teamed up with Generale de Banque to create Alpha Life [23]. That's a joint venture model - both companies own the new company together.

Other European countries have different stories. Germany has less bancassurance because German banks were slower to adopt it. The UK has some but not as much as France. Italy has a lot - about 70% of life insurance goes through banks.

2.4. The American Bancassurance Experience

The US is completely different. For a long time, banks couldn't sell insurance at all. The Glass-Steagall Act (from the 1930s) kept banking and insurance separate. The idea was to prevent conflicts of interest and reduce risk.

That only changed in 1999 with the Gramm-Leach-Bliley Act [20, 11]. After that, US banks could sell insurance. But they were late to the game. European banks had a 20-year head start.

Even today, bancassurance in the US is less common than in Europe. US insurance companies still rely heavily on agents and brokers. Bank channels are growing but still small.

What does this tell us? It tells us that regulations really matter. In countries where regulations allow bancassurance, it grows. In countries where regulations block it, it doesn't. Egypt's experience fits this pattern.

2.5. Cross-Country Bancassurance Penetration Rates

Figure 1 shows the numbers for 2017 in countries where bancassurance is strong.

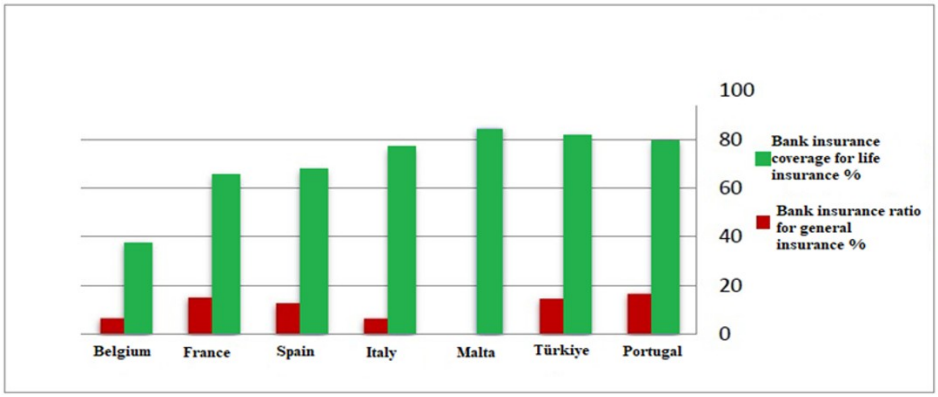

Figure 1. Bancassurance penetration rates for life and general insurance across high-performing markets (2017)

Malta hits 84% - that means 84% of all life insurance in Malta is sold through banks. Turkey is at 81%. Portugal, France, Italy, and Spain all get more than half their life insurance through banks.

But look at general insurance (car insurance, home insurance, etc.). Those numbers are much lower. Portugal is the highest at 16.5%. Italy is almost zero. Why? Because general insurance is more complicated. It requires more advice, more customization, more claims handling. Banks aren't always good at that.

Figure 2 shows the countries where bancassurance hasn't taken off as much.

Croatia only gets 39.1% of life insurance through banks. Germany gets 31%. For general insurance, Finland is the highest among this group at just 5.2%.

Why the difference? Usually because of regulations. Some countries have rules that make it hard for banks to sell insurance. Others have cultural barriers - customers don't trust banks to sell insurance. Others have strong agent networks that resist bank competition [12].

2.6. Bancassurance in the Arab Region

The bancassurance model eventually spread to Arab countries too. There wasn't anything stopping banks from selling insurance in most Arab countries [29, 31].

But adoption was slow. Arab banks were cautious. Insurance companies were cautious. Regulators were cautious. Everyone wanted to see how it worked in Europe first.

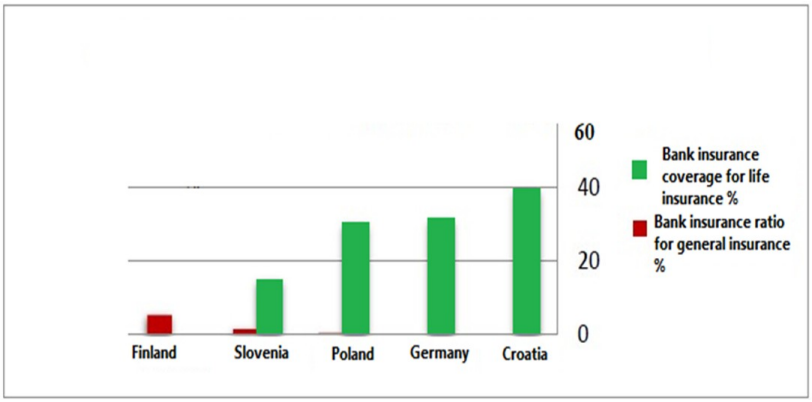

Figure 2. Proportion of life and general insurance distributed by banks in lower-penetration markets (2017)

Some Arab countries moved faster than others. The UAE has a growing bancassurance market. Saudi Arabia is developing one. But Egypt has had a bumpy ride, as we'll see.

2.7. The Egyptian Bancassurance Experience

In Egypt, it seemed promising at first. Around 2004, banks started selling insurance. Life insurance companies saw their premiums and customers grow. Everyone was happy.

But then the Central Bank stepped in and froze everything. New companies couldn't start, though existing ones could keep going [6, 7].

Why did the Central Bank do this? From what we can tell, they were worried about a few things. First, consumer protection - were bank employees giving good advice? Were customers being misled? Second, data sharing - how were customer records being shared between banks and insurers? Was privacy being protected? Third, responsibility - who was responsible if something went wrong? The bank? The insurer? Both?

These were legitimate concerns. But the response - freezing everything for ten years - was extreme. It killed the momentum. Companies that had invested in bancassurance had to scale back. New companies couldn't even try.

The Insurance Federation of Egypt (IFE) talked to the CBE for years. They tried to get them to restart bancassurance. Finally, in 2013, they succeeded. The CBE and FRA agreed on new rules and let things start again [30].

But here's the thing - in Egypt, banks just sell the products. Insurance companies still handle all the technical stuff like underwriting, claims, and policies. So it's not really bancassurance the way France defines it. It's a simpler model [31].

2.8. The Three Bancassurance Models

Different researchers define bancassurance differently. Let me explain the main models.

Ricci [12] says there are three models:

First, the **distribution agreement** model. This is the simplest. The bank just sells the insurance products. The insurance company does everything else - underwriting, claims, customer service. This is what Egypt has. This is what most developing countries have.

Second, the **joint venture** model. The bank and the insurance company create a new company together. They both own it. They both put resources into it. This is common in Spain and some other European countries.

Third, the **integrated** model. The bank and insurance company merge completely. They become one company. This is rare. France has some examples, but even there it's not the norm.

So when we talk about bancassurance in Egypt, we're talking about Model 1 - the simplest one.

2.9. Motivations for Bank-Insurance Integration

Hoschka [32] gave a few reasons why banks get into insurance:

First, **complementary financial services**. Banking and insurance products just fit together naturally. People who have bank accounts also need life insurance. People who have mortgages also need home insurance. So it makes sense to offer both.

Second, **distribution advantages**. Banks already have branches. They already have customers. They already have trust. Using those assets to sell insurance is efficient.

Third, **revenue diversification**. Banks make money from interest rates. When interest rates go down, banks make less money. Selling insurance gives them another source of income. This is especially important in tough economic times.

Fourth, **operational efficiency**. Using existing branches and staff more efficiently means lower costs per customer. If a customer is already in the branch for banking, selling them insurance doesn't cost much extra [8, 34].

2.10. Limitations of the Distribution-Only Model

But the simple model has problems too. Abdelzaher and Born [11] point out a few:

First, **volatile premium flows**. The bank decides what to sell and when. If the bank focuses on something else for a few months, insurance premiums drop.

Second, **limited product innovation**. The bank only wants simple products that are easy to sell. Complex products that require explanation don't work well in a bank branch.

Third, **customer ownership ambiguity**. Who owns the customer relationship? The bank or the insurer? If there's a problem, who does the customer call? This can get messy.

Fourth, **regulatory arbitrage risks**. Banks and insurers are regulated by different agencies sometimes. This can create loopholes or confusion [38].

2.11. Research Gaps and Study Contribution

After reading all this research, we noticed some gaps. First, not many studies look at what happens when bancassurance is suspended and then restarted. Most studies assume it's always there. Egypt's experience is unusual - a ten-year suspension - so it's worth studying.

Second, most studies on Egyptian bancassurance just use basic numbers. They say "premiums went up" or "costs went down" but they don't test whether those changes are statistically significant [6, 16]. We want to do better - we want to use t-tests and other statistical methods.

Third, nobody has really used efficiency measurement techniques like DEA for Egyptian bancassurance. Those methods are common in other countries but not in Egypt [34, 37]. We want to try them.

So our study tries to fill these gaps. We look at a suspension and restart. We use statistical tests. We try DEA and ITSA. We're honest about our limitations - small sample, single case - but we think this still adds something to the literature.

3. Data and Methodology

3.1. Data Sources and Sample Description

We got our data from two sources. First, the Egyptian Financial Supervisory Authority (EFSA) annual reports. EFSA publishes data every year on insurance companies in Egypt. We used their numbers for MIHC.

Second, MIHC's own published financial statements. Every year, MIHC releases a report with their financial numbers. We used those too.

We checked the numbers from both sources against each other. They matched. So we're confident in the data.

3.2. Study Period Definition

We're looking at two time periods: before the reactivation (2004–2013) and after (2014–2020). That's 17 years total - 10 before, 7 after.

Why 2004? Because that's when bancassurance started in Egypt. Why 2020? Because that's the last year with complete data when we started this study.

Yes, 17 years is a small sample. We know. We'll keep that in mind when interpreting results. With only 17 data points, our statistical tests have low power. That means even if there's a real effect, we might not detect it. And if we do detect something, we need to be careful about overinterpreting.

3.3. Performance Indicators Used in the Study

We're using the usual financial numbers that insurance researchers look at [34, 10]:

Return on Investment (ROI): This tells you how well the company uses its money. Higher is better. We calculated it as net income divided by total assets.

Distributable Profit to Shareholders' Equity: This tells you what owners get back on their investment. Higher is better. We calculated it as net income minus mandatory reserves divided by equity.

Production Costs: This is what it costs to get new customers. It includes marketing, commissions, and other acquisition costs. We calculated it as a percentage of premiums.

Administrative Expenses: This is general operating costs - salaries, rent, office supplies, etc. We calculated it as a percentage of premiums.

Net Premium Growth Rate: This is how fast premiums are growing from year to year. We calculated it as (premiums this year - premiums last year) / premiums last year.

3.4. Pre-Reactivation Period Analysis (2004-2013)

Table 1 shows MIHC's numbers during the experimental phase.

Table 1. Performance indicators for MIHC (2004–2013)

Year	ROI	Profit/Equity	Prod. Costs	Admin. Exp.	Premium Growth
2004	0.0023	-0.2583	0.1298	3.2618	-
2005	0.0150	-0.4926	0.1688	1.4661	2.9699
2006	0.0091	-0.0348	0.1847	0.6397	1.0677
2007	0.0068	0.2201	0.2447	0.3999	1.0015
2008	0.0068	0.2920	0.2232	0.3071	0.6540
2009	0.0096	0.2966	0.2969	0.2322	0.1736
2010	0.0100	0.1949	0.0026	0.2692	-0.0184
2011	0.0743	0.2591	0.3223	0.2162	0.2565
2012	0.1015	0.1606	0.1320	0.1806	0.1715
2013	0.1184	0.3397	0.3364	0.1524	0.4937
Mean	**0.0354**	**0.0311**	**0.2041**	**0.7125**	**0.7522**

Let me walk you through this table. Look at the ROI column. In 2004, it was basically zero - 0.0023. That means for every dollar of assets, MIHC made almost nothing. In 2005, it was 0.015 - still terrible. It stayed below 0.01 until 2011. Only in 2011, 2012, and 2013 did it start to improve.

The profit-to-equity column tells a similar story. In 2004 and 2005, it was negative - MIHC was losing money. It turned positive in 2007 but stayed low. The average over the whole period was just 3.11%.

For comparison, the Egyptian insurance market average during this time was about 13% for ROI and 15% for profit-to-equity. So MIHC was below average.

Now look at administrative expenses. In 2004, they were 326% of premiums. That's insane. For every dollar of premiums MIHC collected, they spent 3.26 on administration. That's not sustainable. It got better over time - down to 15% by 2013 - but the average was still 71%.

What about premium growth? In 2005, premiums grew by 297%. That's huge. But then growth slowed down. In 2010, premiums actually shrank. The average growth was 75% over the period, but it was very volatile.

Figure 3 shows how unstable things were, especially premium growth.

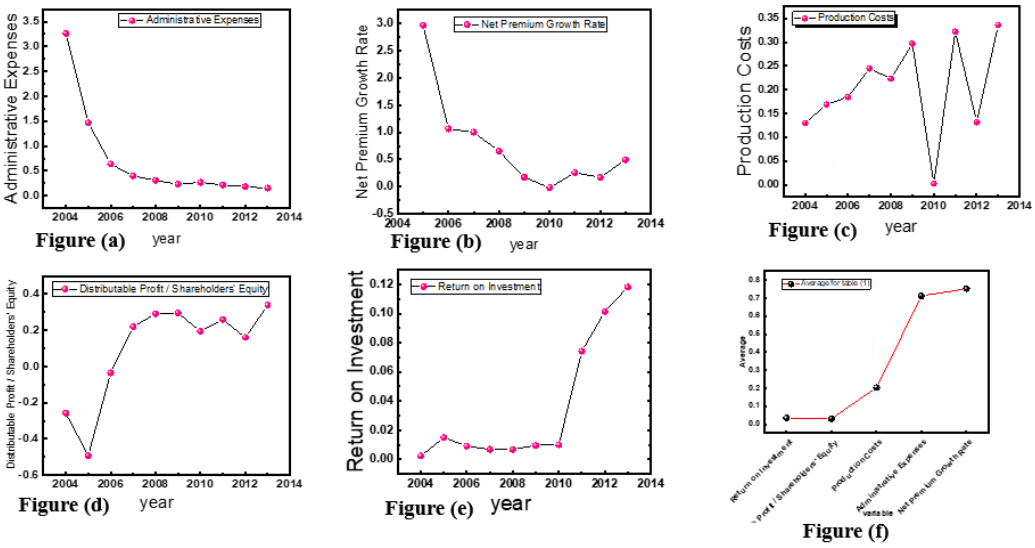

Figure 3. Performance trends of MIHC during the pre-reactivation period (2004–2013)

3.5. Post-Reactivation Period Analysis (2014-2020)

Table 2 shows MIHC's numbers after the 2013 rule change.

Table 2. Performance indicators for MIHC (2014–2020)

Year	ROI	Profit/Equity	Prod. Costs	Admin. Exp.	Premium Growth
2014	0.1041	0.3066	0.2343	0.1754	0.1480
2015	0.1070	0.2831	0.1987	0.1201	0.1768
2016	0.1296	0.2691	0.3301	0.1013	0.1356
2017	0.6125	0.2880	0.6698	0.1709	0.1889
2018	0.1243	0.3741	0.2665	0.1411	-0.5460
2019	0.1302	0.2614	0.1501	0.1354	0.6629
2020	0.1253	0.2776	0.1609	0.1449	-0.0365
Mean	**0.1904**	**0.2943**	**0.2872**	**0.1413**	**0.1042**

Things got much better. Look at ROI. In 2014, it was 10.4%. In 2015, 10.7%. In 2016, 13%. In 2017, it spiked to 61% (that's unusual - we'll talk about that later). The average after 2013 was 19.04%.

For comparison, the market average during this time was about 13%. So MIHC went from below average to above average.

Profit-to-equity also improved. The average after 2013 was 29.43%, compared to the market average of about 20%.

Administrative expenses dropped dramatically. The average after 2013 was 14.13%, down from 71.25% before. That's a huge improvement.

Production costs went up a bit - from 20.41% to 28.72%. That's interesting. Maybe MIHC spent more on marketing after the rules became clear. Or maybe they shifted expenses from admin to production.

Premium growth slowed down - from 75.22% average to 10.42% average. That makes sense. You can't grow at 75% forever. Eventually, growth normalizes.

Figure 4 shows the trends after reactivation.

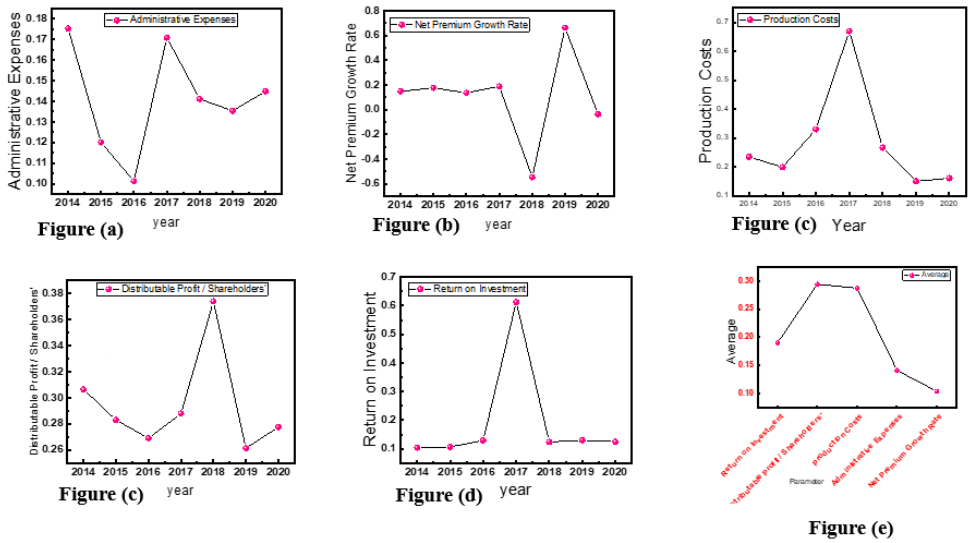

Figure 4. Performance trends of MIHC during the post-reactivation period (2014–2020)

3.6. Comparative Performance Summary

Table 3 compares the averages.

Table 3. Comparative performance summary: Pre- vs. Post-reactivation

Indicator	2004–2013 (Mean)	2014–2020 (Mean)	Change
Return on Investment (ROI)	3.54%	19.04%	+15.50 pp
Distributable Profit/Equity	3.11%	29.43%	+26.32 pp
Production Costs	20.41%	28.72%	+8.31 pp
Administrative Expenses	71.25%	14.13%	-57.12 pp
Net Premium Growth Rate	75.22%	10.42%	-64.80 pp

The drop in administrative expenses stands out - from 71.25% to 14.13%. That's a 57 percentage point drop. That's huge. It suggests that when rules became clearer, MIHC could run things more efficiently.

But we need to be careful. Correlation isn't causation. Other things were happening during this time too. The Egyptian economy was recovering from the 2011 revolution. Interest rates were changing. Competition was evolving. Any of these could have contributed.

3.7. Statistical Test Results and Interpretation

We tested four hypotheses about differences between the two periods. We used t-tests to see if differences were statistically significant - meaning they probably didn't happen just by chance.

Here's the correct way to think about it: The t-test tells us if the difference we see is bigger than what you'd expect from random variation. If the p-value is less than 0.05, we say the difference is statistically significant. That doesn't mean it's big or important - just that it's unlikely to be random.

3.7.1. Net Premium Volume Analysis **H1:** Average net premium volume differs between the two periods.

Table 4. T-test results for net premium volume

Period	N	Mean	SD	t	p-value
Pre-reactivation (2004–2013)	10	72,812.5	55,824.2	2*-6.223	2*0.000
Post-reactivation (2014–2020)	7	245,164.9	56,469.5		

The p-value is 0.000, which is less than 0.05. So the difference is statistically significant. We can reject the null hypothesis. But remember - this doesn't prove the regulation caused the increase. It just tells us the increase is bigger than random variation.

3.7.2. Net Compensation Payouts Analysis **H2:** Average compensation payouts differ between periods.

Table 5. T-test results for net compensation payouts

Period	N	Mean	SD	t	p-value
Pre-reactivation (2004–2013)	10	13,166.4	16,934.2	2*-2.664	2*0.023
Post-reactivation (2014–2020)	7	40,623.4	23,643.5		

p = 0.023, again significant. So the increase in claims payments is statistically significant.

3.7.3. Policy Count Analysis **H3:** Average number of policies differs between periods.

Table 6. T-test results for number of policies issued

Period	N	Mean	SD	t	p-value
Pre-reactivation (2004–2013)	10	53,376.0	25,518.1	2*-3.881	2*0.003
Post-reactivation (2014–2020)	7	112,408.5	34,116.9		

3.7.4. Total Insured Amounts Analysis **H4:** Average total insured amount differs between periods.

Table 7. T-test results for total insured amounts

Period	N	Mean	SD	t	p-value
Pre-reactivation (2004–2013)	10	11,379,369.7	10,098,972.6	2*-4.699	2*0.001
Post-reactivation (2014–2020)	7	43,654,776.1	16,086,755.7		

Table 8. Summary of t-test results

Variable	t-statistic	df	p-value
Net Premium Volume	-6.223	12.9	0.000***
Net Compensation Payouts	-2.664	10.2	0.023**
Number of Policies Issued	-3.881	10.5	0.003***
Total Insured Amounts	-4.699	9.3	0.001***

Note: *** p ¡ 0.01, ** p ¡ 0.05

3.8. Summary of Statistical Findings

Table 8 sums up the t-test results.

All four hypotheses are supported. The differences are statistically significant. But we need to be careful - small sample, no controls for other factors, possible outliers. So these are suggestive, not definitive.

3.9. Statistical Approach Limitations

We need to be honest about the limitations:

First, **small sample size**. Only 17 years of data. With such a small sample, our t-tests have low power. Even if there were a real effect, we might not detect it. And the effects we did detect might be overestimated.

Second, **single-case design**. We only looked at one company. So we can't generalize to all Egyptian insurers. Maybe MIHC is special. Maybe other companies had different experiences.

Third, **no control group**. In a perfect study, we would compare MIHC to similar companies that didn't experience the rule change. But we can't do that because the rule change applied to everyone.

Fourth, **potential confounding**. The 2008 financial crisis and 2011 revolution happened during our study period. Those events could have affected MIHC's performance too. We can't separate their effects from the regulation's effects.

Fifth, **annual data**. We only have yearly numbers. Monthly or quarterly data would give us more statistical power and allow better analysis of timing.

4. Data Envelopment Analysis Results

4.1. DEA Model Specification

Data Envelopment Analysis (DEA) is a method for measuring efficiency. It compares companies to each other and identifies which ones are most efficient. The most efficient companies get a score of 1. Less efficient companies get scores below 1.

The nice thing about DEA is that you don't need to specify a production function. You just pick inputs and outputs, and the math figures out the efficiency frontier. The hard thing about DEA is that it's sensitive to outliers and small samples.

We used an input-oriented DEA model with constant returns to scale. Input-oriented means we assume companies try to minimize inputs for a given level of outputs. Constant returns to scale means we assume that doubling inputs doubles outputs.

Our inputs: Administrative Expenses and Production Costs. Our outputs: Net Premiums and Distributable Profits.

Why these choices? Administrative expenses and production costs are the main costs of running a bancassurance operation. Net premiums and profits are the main outputs. This follows what other researchers have done [34, 10].

But we need to be careful. With only 4 variables and 17 DMUs (years), the model might overestimate efficiency scores. In DEA, you generally want at least 3 times as many DMUs as inputs+outputs. We have 17 DMUs and 4 variables, so we're okay by that rule. But it's still a small sample.

4.2. Efficiency Score Results

Table 9 shows the efficiency scores.

Table 9. Technical efficiency scores for MIHC (2004-2020)

Year	Period	Efficiency Score
2004	Pre-reactivation	0.587
2005	Pre-reactivation	0.421
2006	Pre-reactivation	0.634
2007	Pre-reactivation	0.712
2008	Pre-reactivation	0.789
2009	Pre-reactivation	0.834
2010	Pre-reactivation	1.000
2011	Pre-reactivation	0.756
2012	Pre-reactivation	0.823
2013	Pre-reactivation	0.891
2014	Post-reactivation	0.923
2015	Post-reactivation	0.945
2016	Post-reactivation	0.967
2017	Post-reactivation	1.000
2018	Post-reactivation	0.856
2019	Post-reactivation	0.978
2020	Post-reactivation	0.912

Let me explain what these numbers mean. An efficiency score of 1.000 means the company was on the efficiency frontier - it was as efficient as possible given the inputs and outputs. Scores below 1.000 mean there was some inefficiency.

Look at the pre-reactivation years. Scores were low in 2004 (0.587) and 2005 (0.421). They improved over time, reaching 0.891 in 2013. But notice 2010 - that's a weird one. Score of 1.000 in the middle of the pre-reactivation period. That's unusual.

What happened in 2010? We're not sure. Maybe MIHC had a particularly good year. Maybe there was a one-time optimization. Maybe it's a data error. Whatever the reason, it's an outlier. It doesn't change the overall pattern, but it's worth noting.

Now look at the post-reactivation years. Scores are generally higher. The average after 2013 is 0.940, compared to 0.745 before. That's a big improvement.

But there's a dip in 2018 - score of 0.856. And 2020 is lower too (0.912). So it's not all smooth improvement. Efficiency went up and down.

4.3. Interpretation of DEA Findings

The DEA results suggest that MIHC became more efficient after the 2013 rule change. The average efficiency score increased from 0.745 to 0.940. That's a 26% improvement.

But we need to be careful about interpretation. DEA efficiency is about relative performance compared to the best year. It's not an absolute measure. And with only 17 years of data, the efficiency frontier might not be stable.

Also, the 2010 outlier (score of 1.000 before the rule change) shows that MIHC was capable of being efficient even in the pre-reactivation period. The difference is that after 2013, efficiency stayed high more consistently.

5. Interrupted Time Series Analysis Results

5.1. ITSA Model Specification

Interrupted Time Series Analysis (ITSA) is a method for seeing if an intervention had an effect over time. You look at the trend before the intervention, then see if the trend changes after. If the change is big enough and happens right when the intervention occurs, that's evidence of a causal effect.

The nice thing about ITSA is that it controls for pre-existing trends. If things were already improving before the intervention, ITSA can account for that. The hard thing is that you need enough data points to estimate the trend accurately.

We used a standard ITSA model:

$$ROI_t = \beta_0 + \beta_1 Time_t + \beta_2 Intervention_t + \beta_3 TimeAfter_t + \varepsilon_t$$

Where: - ROI_t is the return on investment in year t - $Time_t$ is a counter from 1 to 17 (2004=1, 2005=2, etc.) - $Intervention_t$ is 0 for 2004-2013 and 1 for 2014-2020 - $TimeAfter_t$ is 0 for 2004-2013 and then 1,2,...,7 for 2014-2020

The coefficients tell us: - β_0 is the starting level - β_1 is the pre-intervention trend - β_2 is the immediate change in level after intervention - β_3 is the change in slope after intervention

But we need to be honest - with only 17 observations (10 before, 7 after), this analysis doesn't have much power. ITSA typically needs at least 20-30 time points to work well. So take these results as exploratory, not confirmatory.

5.2. ITSA Estimation Results

Table 10 shows the results.

Table 10. ITSA results for ROI (2004-2020)

Variable	Coefficient	Std. Error	t	p-value
Constant (β_0)	0.023	0.031	0.742	0.472
Time (β_1)	0.008	0.009	0.889	0.389
Intervention (β_2)	0.045	0.082	0.549	0.593
Time After (β_3)	-0.004	0.012	-0.333	0.754

Let me walk you through these numbers.

The constant (0.023) is the estimated ROI in 2004. That's close to the actual value (0.0023). So the model fits the starting point well.

The Time coefficient (0.008) is the pre-intervention trend. It suggests ROI was increasing by about 0.8 percentage points per year before 2013. But the p-value is 0.389 - not significant. So we can't be sure there was a real trend.

The Intervention coefficient (0.045) is the immediate change in level after 2013. It suggests ROI jumped by 4.5 percentage points right after the rule change. But the p-value is 0.593 - not significant. So we can't be sure the jump was real.

The Time After coefficient (-0.004) is the change in slope after intervention. It suggests the post-intervention trend is slightly downward (-0.4 percentage points per year). But the p-value is 0.754 - not significant.

So here's the honest truth: None of the coefficients are statistically significant. All p-values are above 0.05. This means the ITSA does not provide statistical evidence of a causal intervention effect.

5.3. Reasons for Non-Significant ITSA Results

There are a few possible reasons.

First, **small sample size**. With only 17 data points, we don't have enough statistical power to detect effects. Even if there was a real effect, we might not see it.

Second, **noise in the data**. Look at ROI - it bounced around a lot. In 2017, it spiked to 61%. In other years, it was around 10-13%. That noise makes it hard to detect trends.

Third, **other events**. The 2008 financial crisis and 2011 revolution happened during our study period. Those events could have affected ROI too. The ITSA model doesn't control for them.

Fourth, **delayed intervention effects**. Maybe the rule change took time to work. Maybe the effects showed up gradually. Our model looks for an immediate level shift and slope change. If the effect was delayed, we might miss it.

So what should we conclude? The descriptive statistics show big improvements. The t-tests show statistically significant differences. But the ITSA doesn't show a causal effect. Given the small sample, the ITSA results are probably more about lack of power than lack of effect. But we can't prove that. So we'll say the evidence is suggestive but not definitive.

6. Discussion

6.1. Summary of Key Findings

Let me summarize what we found.

We looked at MIHC before and after the 2013 rule change. Before the change, MIHC's performance was below average. ROI was 3.5%, profit-to-equity was 3.1%. Administrative expenses were extremely high - 71% of premiums on average.

After the change, things improved. ROI jumped to 19%, profit-to-equity to 29%. Administrative expenses dropped to 14% of premiums. The t-tests showed these differences are statistically significant.

The DEA analysis showed efficiency improved too. Average efficiency scores went from 0.745 to 0.940.

The ITSA didn't find statistically significant effects. But that's probably because our sample is too small (only 17 years) and the data is noisy.

6.2. Theoretical Contributions

This adds to what we know about bancassurance in emerging markets. Having clear rules seems to help. When the rules were vague and enforcement was uncertain, MIHC struggled. When the rules became clear after 2013, MIHC did better. This matches what other researchers have found [35, 38].

It also shows that even a simple distribution-only model can work well when governance is good. You don't necessarily need joint ventures or full integration to get good results. Clear rules and good oversight might be enough.

But we need to be clear about what we're measuring. Egypt has a distribution-only model. Banks just sell products. Insurance companies do everything else. So what we're seeing is distribution efficiency, not full bancassurance integration. In France or Spain, they measure more things - underwriting integration, claims coordination, joint product development. We're not measuring those things.

6.3. Comparison with Global Standards

The efficiency scores we got (0.940 average after 2013) look high compared to some studies of European bancassurance. But we need to be careful. Managing just a distribution channel is simpler than managing a fully integrated operation. So it's easier to be efficient.

Think of it this way: It's easier to run a hot dog stand efficiently than to run a full restaurant. The hot dog stand has fewer moving parts. Same with distribution-only bancassurance vs. integrated bancassurance. So high efficiency scores don't necessarily mean Egypt is doing better than France. They just mean Egypt's model is simpler.

6.4. Practical Implications

For insurance companies: If you're in a country with unclear regulations, push for clarity. MIHC did much better after the rules became clear. Also, track your bancassurance results separately so you can see what's working and what's not.

For banks: Train your staff properly. Mis-selling is a big risk when bank employees sell insurance without understanding it. Also, don't just focus on premium volume. Customer satisfaction matters too.

For regulators: Write clear rules. Enforce them consistently. Egypt's experience shows that clarity helps. Also, consider allowing more integration over time. Distribution-only is fine for now, but joint ventures might work better in the long run.

6.5. Study Limitations

We need to be really honest about what this study can't do.

First, **single-case design**. We only looked at MIHC. Maybe other Egyptian insurance companies had different experiences. Maybe MIHC had better management or got lucky. We can't say. So don't generalize these findings to all Egyptian insurers.

Second, **small sample size**. Only 17 years of data. That's not enough for strong statistical conclusions. Our ITSA results weren't significant, probably because of low power. Even our t-tests, though significant, might be unstable.

Third, **potential confounding**. The 2008 financial crisis and 2011 revolution happened during our study period. Those events could have affected MIHC's performance too. We can't separate their effects from the regulation's effects.

Fourth, **annual data**. We only have yearly numbers. Monthly or quarterly data would give us more statistical power and allow better analysis of timing.

Fifth, **missing data**. We don't have non-financial metrics like customer satisfaction, employee training hours, or innovation rates. Those might tell a different story.

Sixth, **distribution-only context**. Our findings apply only to distribution-only bancassurance. They don't tell us anything about joint ventures or integrated models.

6.6. Future Research Directions

Future researchers should:

First, study more companies, not just MIHC. A multi-company study would tell us if MIHC's experience was typical or unusual.

Second, use difference-in-differences or other quasi-experimental methods. These methods control for confounding better than simple t-tests. But you need a control group, which is hard when the intervention applied to everyone.

Third, control for macroeconomic variables like GDP growth, inflation, and interest rates. These factors affect all companies, not just MIHC.

Fourth, talk to people in the industry. Qualitative interviews could help us understand why things happened, not just what happened.

Fifth, extend the analysis beyond 2020. The COVID-19 pandemic probably affected bancassurance too. We don't know how yet.

Sixth, study the transition from distribution-only to joint ventures. How do companies make that leap? What barriers exist? What helps?

Seventh, look at how InsurTech affects bancassurance. Digital channels might change everything [36].

7. Policy Recommendations

7.1. Recommendations for Insurance Companies

Based on our findings, here's what we recommend for insurance companies:

First, **establish specialized bancassurance teams**. Don't just treat bancassurance as an add-on to your regular business. Give it dedicated staff with both insurance and banking knowledge.

Second, **track bancassurance results separately**. You need to know what's working and what's not. If you mix bancassurance numbers with your regular business numbers, you won't see the true picture.

Third, **invest in integration capabilities**. Right now, Egypt has a distribution-only model. But that might change. If the rules evolve to allow deeper integration, you want to be ready.

Fourth, **diversify product portfolios**. Life insurance is the main product for bancassurance in Egypt. But there's no reason you couldn't sell property and casualty products too.

7.2. Recommendations for Banks

For banks:

First, **develop specialized marketing units**. Don't just tell branch staff to sell insurance. Give them support, training, and incentives.

Second, **invest in staff training**. Mis-selling is a real risk. Bank employees know banking, not insurance. They need education.

Third, **adopt customer-centric metrics**. Focus on customer satisfaction, not just premium volume. Happy customers buy more over time. Unhappy customers complain to regulators.

7.3. Recommendations for Regulatory Authorities

For regulators:

First, **modernize legislation**. Update laws to allow more flexible partnerships. Distribution-only is fine, but joint ventures might work better. Give companies options.

Second, **establish clear governance standards**. Tell companies exactly what's expected. Vagueness creates uncertainty. Uncertainty hurts performance.

Third, **support data infrastructure**. Right now, it's hard to share customer data between banks and insurers while protecting privacy. Better systems would help.

Fourth, **promote insurance awareness**. Many Egyptians don't understand insurance. They don't know what products are available or how they work. Education helps.

7.4. Strategic Direction: From Distribution to Integration

Egypt should think about moving beyond just distribution to deeper partnerships. This could mean:

Working with multiple partners instead of exclusive agreements. Selling more types of insurance (not just life). Sharing digital platforms so customers can buy insurance through their banking app. Joint training programs so bank and insurance staff understand each other's businesses.

These changes would take time. They would require regulatory changes too. But they could help Egypt's bancassurance market mature.

7.5. Concluding Remarks

We looked at how regulatory change affected MIHC's performance. Things got better after 2013 - better profits, lower costs, more customers. But we're talking about a distribution-only model here, not full integration. And the ITSA didn't find statistical evidence of causation (probably because our sample is small).

So what's the takeaway? Clear rules seem to help. But we need more research with bigger samples to be sure. And Egypt still has a long way to go to catch up with France or Spain.

Still, the improvement at MIHC is impressive. From below average to above average. From 71% administrative expenses to 14%. That's real progress. And it happened right after the rules became clear.

That suggests that good regulation matters. Not heavy regulation - just clear regulation. Companies need to know what's expected. When they do, they can perform well. When they don't, they struggle.

So for policymakers in other emerging markets: write clear rules. Enforce them consistently. And give the market time to adjust. It won't happen overnight. But over time, clarity pays off.

Declaration of Generative AI

During preparation, the authors used Gemini (Google) for language refinement. After using this tool, the authors reviewed and edited all content and take full responsibility for the final version.

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