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Bank Deregulation and Relative Wages in Finance

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Abstract

Rising wages in the finance industry has been a source of debate and are usually liked to financial deregulations. Exploiting the cross-state and over-time variation in the timing of US bank deregulations, this paper investigates the causal impact of each type of deregulation on the relative wages in the finance industry. I document that relative wages in finance began to rise in the early 1980s in almost all states including those that deregulated before 1970 and those that deregulated in the 1990s. Consistently, after controlling for aggregate macro shocks that affected all states, there is *no* evidence that relative finance wages increased more following any type of deregulation. If anything, I find a negative impact of bank branching deregulation on relative wages in finance. These results together with those found in Philippon and Reshef (2012) call for a better understanding of the dynamics of wages in the finance industry.

Keywords: Bank Deregulation, Finance Wages, Bank Branching
JEL Classification: G21, J3, K2

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1 Introduction

Increasing wages in the finance industry during the past few decades has received a great deal of attention in the media, among policymakers, and in the academic community (see, for example, Krugman (2009); Tett (2012); Bolton et al. (2011) ;Axelson and Bond (2011)). There has been, however, very few empirical research on why workers in finance are paid relatively higher than their peers in other industries. An exception is Philippon and Reshef (2012), who investigate the determinants of wages and human capital in the US finance industry. They argue that financial deregulations increase the complexity of jobs in the finance sector, which in turn lead to higher demand for skilled labor and higher wages of workers in the finance industry. They construct a measure of financial deregulation combining four different deregulations which occurred over the last century in the U.S. financial market and find evidence that this measure is closely correlated with the relative wages in the finance sector.

The deregulation index used in Philippon and Reshef (2012) is a constructed measure combining different (de)regulations in the U.S. financial markets. In particular, it includes:

1. Bank branching restrictions: they use the share of the U.S. population living in states that have removed intrastate branching restrictions via *mergers and acquisitions*[1].
2. Separation of commercial and investment banks. The Glass-Steagall act was legislated in 1933 and was gradually weakened starting in 1987 until the final repeal in 1999. The variable is between 0 and 1.
3. Interest rate ceilings. Legislation was introduced in 1933 and was removed gradually between 1980 and 1984. The variable is between 0 and 1.
4. Separation of banks and insurance companies. Legislation was introduced in 1956 and was repealed in 1999. The variable is between 0 and 1.

The deregulation index used by Philippon and Reshef (2012) is then given by (1)-(2)-(3)-(4).

While the last three deregulations happened at the national level, bank branching deregulation occurred at the state-level between 1970s and 1990s. As such, I exploit the simultaneous existence of cross-sectional and over-time variation concerning individual states' timing of deregulation to estimate the causal impact of bank deregulation on relative wages in finance. This identification strategy allows me to control for common macro shocks affecting all states and hence minimizes the concerns regarding endogeneity and omitted

[1]The branching indicator is a continuous variable. It starts at 16.7% in 1960 and increases to 100% by 1999. From 1927 to 1960, they set the indicator at 16.7%. As the McFadden Act of 1927 prevented branching and before that it was less clear, they set the indicator to 0.3 in the years 1909-1926 (see Appendix in Philippon and Reshef (2012).

variable bias problem. I investigate the impact of bank branching deregulation via mergers and acquisition, *de novo* branching, interstate banking deregulation, as well as a deregulation index which incorporates all three deregulations. After controlling for common macro shocks, there is no evidence that any types of bank deregulation increased the relative wages in finance. Instead, I show that there is something common to all states (and not the timing of bank deregulation) that increased wages in the finance industry.

2 The History of U.S. Banking Deregulation

Banks' ability to operate branch networks and holding company structures has been subject to state legislation since the 1920s. Many states imposed restrictions on these banking activities both within and across state borders. Between 1970 and 1994, however, such restrictions were gradually lifted in almost all states. Between 1970 and 1999, 39 states eased their restrictions on branching. The reform of restrictions on intrastate branching typically occurred in a two-step process. First, states permitted multi-bank holding companies (MBHCs) to expand geographically by acquiring banks and converting them into branches (intrastate branching via M&A). Second, states began permitting *de novo* branching, whereby banks could open new branches anywhere within state borders.

In addition to branching limitations, states also prohibited cross-state ownership of banks branches. Deregulation of interstate banking began in 1978, when Maine passed a law allowing entry by out-of-state BHCs if, in turn, banks from Maine were allowed to enter those states. No state reciprocated, however, so interstate banking was effectively unchanged until 1982, when Alaska and New York passed laws similar to Maine's. Other states then followed and state deregulation of interstate banking was complete by the end of 1990s. Table 1 presents the timing of all these deregulation for each state.

3 Data and Identification Strategy

I follow Philippon and Reshef (2012) to construct wages in finance relative to other non-farm private industries using the Bureau of Economic Analysis (BEA). My data is, however, at the state level. The data spans from 1969 to 1997, the period relevant for bank deregulations.

First I construct the average wages in each industry, which is calculated by dividing total compensation over the number of employees in each industry. Compensation of employees in an industry is the sum of wages and salaries and supplements to wages and salaries paid to employees in the industry. Having average wages at the industry level, the relative wages in finance compared to other non-farm private industries at

time t in state s is given as follows:

$$rw_{fin,s,t} = \frac{wage_{fin,s,t}}{wage_{nonfarm,s,t}}.$$

Having seen this evidence, I estimate the impact of the U.S. bank deregulation on relative finance wages between 1969 and 1997 using the following identification strategy.

$$Y_{st} = \text{Constant} + \alpha_t + \beta_s + \gamma D_{t,s} + \varepsilon_{t,s} \quad (1)$$

where Y_{st} equals wages in the finance industry relative to non-farm private industries of state s over time t. α_t, year-specific dummy variables (in some specifications I drop time trends to see the difference), control for nation-wide shocks that shape relative finance wages over time, such as a general technological shock, national changes in regulations and laws, long-term trends and so on. β_s, state-specific dummy variables, control for time-invariant differences in long-run finance wages due to unexplained factors that differ across states. The deregulation indicator, $D_{t,s}$, equals to one in all years in which a state was deregulated. In addition to bank branching deregulation via M&A, I consider other types of bank deregulations. In particular, I construct three deregulation indicator: branching deregulation via M&A, *de novo* branching deregulation, and interstate banking deregulation. Each deregulation indicator equals one during all years in which a state is deregulated. In addition, I construct a more general measure of bank deregulation taking into account all three indicators. This index equals one, two, or three during all years a state has done one, two, or three types of bank deregulations. The coefficient of interest is then γ, which is a difference-in-differences estimator.

4 Results and Discussion

4.1 The Evolution of Relative Wages in Finance

Figure 1 shows the evolution of relative wages in the finance industry for most of the states. States are categorized in 4 different groups based on their year of bank branching deregulation via M&A. As shown, relative wages in the finance industry was constant or decreasing in almost all states till the early 1980s. Ever since, average wages in finance compared to other industries start an increase which continued till the end of the sample. This pattern is common to all states but with different magnitudes. Figure 1 suggests that bank branching deregulation was unlikely to have a large impact, if any, on relative finance wages, in that all states including the ones that deregulated very early (such as Arizona, California, and Maryland) or the ones that deregulated very late (such as Florida 1988, Colorado 1991, Minnesota 1993) experienced the same trend starting from 1980. Hence, these graphs indicate that the surge in the relative finance wages in

early 1980s is unlikely to be explained by the timing of individual states' bank deregulation.

4.2 Deregulation and Finance Wages

Having seen the graphical illustration, I turn into regression analysis to formally test whether bank deregulation increased wages in the finance industry compared to other industries. Table 2 presents the results of estimating a regression similar to Equation 1. In the odd columns, the specification is run without time dummies. This enable us to easily compare the results with and without controlling for aggregate macro shocks. The regressions without time dummies (odd columns) suggest a significant relation between deregulations and relative wages in finance. However, after controlling for common macro shocks (even columns), the statistical as well as economic significance of the effect disappear. In other words, there is a component common to all states that explains the increase of wages in the finance sector compared to other industries, and the timings of states' bank deregulations do not matter.

4.3 Deregulation and Wages in Financial Intermediation Subsector

So far, I have examined the impact of bank deregulations on the relative wages in the finance industry as a whole and I have not distinguished different subsectors in finance. Finance is divided between Financial Intermediation and "Other Finance" sectors. While the former includes commercial banks, the latter includes Security and Commodity Brokers and Insurance Agents and Brokers. As discussed in Philippon and Reshef (2012), bank branching affects only Credit Intermediation because it is the subsector that includes banks. Therefore, consistent with the subsector analysis of Philippon and Reshef (2012), the best way is to use the relative wages in the Credit Intermediation sector (as opposed to the total finance sector) since I am specifically interested in the impact of bank branching deregulations.

Table 3 presents the results of regressions estimating the impact of different types of bank deregulation on the relative wages in Credit Intermediation sector. The outcome is very similar to what was found for the finance industry as a whole. That is, after controlling for aggregate macro shocks, there is no evidence that any type of deregulation increased the relative wages in the Credit Intermediation sector. In fact, the second column shows a small *decline* of relative wages in finance following bank branching deregulation.

To sum up, looking at the credit intermediation sector rather than total finance sector reveals that bank branching deregulation has a negative impact, if anything, on the relative wages in the finance industry. All the results discussed here are robust to dropping half of the states with the smallest finance sector.

5 Concluding Remarks

Did the U.S. bank deregulation contribute to the increase of relative wages in finance during the past few decades? Exploiting the staggered timing of state-level bank deregulations in the U.S. from 1970s to 1990s, I investigate the causal effect of different types of bank deregulations on relative wages in the finance industry. The results strongly suggest that state-level bank branching deregulation did *not* increase wages in finance compared to other private non-farm industries. This seems to be in contradict with what Philippon and Reshef (2012) find in the aggregate level. There could be two reasons behind these conflicting results. One is that an omitted variable correlated with the proportion of people living in deregulated states, used as the proxy for bank branching deregulation in Philippon and Reshef (2012), drives their results. Another and more likely reason could be that there exists imporatnt spill-over effects from deregulated states to regulated states. For example, it could be that when a state deregulates, the demand for skilled labor in the finance industry and as a result finance wages increase. If skilled workers in finance are mobile, they could move to deregulated states in case their wages are not increased in regulated states. Therefore, wages in the finance industry of regulated states also rise. Overall, the results found here together with those of Philippon and Reshef (2012) call for a better understanding of the dynamics of wages in the finance industry and more appropriate empirical strategies that can identify the causal effects of different types of deregulations on the evolution of wages in finance.

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Table 1: Year of Deregulation by State

State	via M&A	via *De novo*	Interstate
Alabama	1981	1990	1987
Alaska	1960	< 1970	1982
Arizona	1960	< 1970	1986
Arkansas	1994	**	1989
California	1960	< 1970	1987
Colorado	1991	**	1988
Connecticut	1980	1988	1983
Delaware	1960	< 1970	1988
District of Columbia	1960	< 1970	1985
Florida	1988	1988	1985
Georgia	1983	**	1985
Hawaii	1986	1986	1997
Idaho	1960	< 1970	1985
Illinois	1988	1993	1986
Indiana	1989	1991	1986
Iowa	**	**	1991
Kansas	1987	1990	1992
Kentucky	1990	**	1984
Louisiana	1988	1988	1987
Maine	1975	1975	1978
Maryland	1960	< 1970	1985
Massachusetts	1984	1984	1983
Michigan	1987	1988	1986
Minnesota	1993	**	1986
Mississippi	1986	1989	1988
Missouri	1990	1990	1986
Montana	1990	**	1993
Nebraska	1985	**	1990
Nevada	1960	< 1970	1985
New Hampshire	1987	1987	1987
New Jersey	1977	**	1986
New Mexico	1991	1991	1989
New York	1976	1976	1982
North Carolina	1960	< 1970	1985
North Dakota	1987	**	1991
Ohio	1979	1989	1985
Oklahoma	1988	**	1987
Oregon	1985	1985	1986
Pennsylvania	1982	1990	1986
Rhode Island	1960	< 1970	1984
South Carolina	1960	< 1970	1986
South Dakota	1960	< 1970	1988
Tennessee	1985	1990	1985
Texas	1988	1988	1987
Utah	1981	1981	1984
Vermont	1970	1970	1988
Virginia	1978	1987	1985
Washington	1985	1985	1987
West Virginia	1987	1987	1988
Wisconsin	1990	1990	1987
Wyoming	1988	**	1987

Notes: Intrastate banking via M&A allows banks to branch statewide via mergers and acquisitions only. *de novo* deregulation allows banks to opening new branches. Interstate banking refers to the year in which a state entered into an interstate banking agreement with other states. ** indicates that the state was not deregulated by 1997.

Table 2: Different Types of Bank Deregulation and Relative Wages in Finance

VARIABLES	(1) I	(2) II	(3) III	(4) IV	(5) V	(6) VI	(7) VII	(8) VIII
M&A deregulation	0.163***	0.003						
	(14.776)	(0.224)						
Denovo deregulation			0.180***	0.015				
			(12.064)	(0.980)				
Interstate deregulation					0.174***	0.014		
					(14.948)	(1.517)		
Deregulation index							0.076***	0.006
							(13.300)	(1.055)
Observations	1,479	1,479	1,479	1,479	1,479	1,479	1,479	1,479
Number of statecode	51	51	51	51	51	51	51	51
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	No	Yes	No	Yes	No	Yes	No	Yes
R-Squared	0.630	0.864	0.594	0.864	0.752	0.864	0.734	0.864

Notes: Each column in this table reports statistics from a fixed effect regression, where the dependent variable is the wages in finance relative to non-farm private industries. Average wages in each industry is calculated by dividing total compensation of employees over the number of employees. The difference between odd and even columns is that even columns include time fixed effects. The data is from 1969 to 1997 and includes 50 states plus District of Columbia. Standard errors are clustered at the state level. Values of t-statistics are in parentheses, where *** indicates significance at 1% level, ** indicates significance at 5% level and * indicates significance at 10% level.

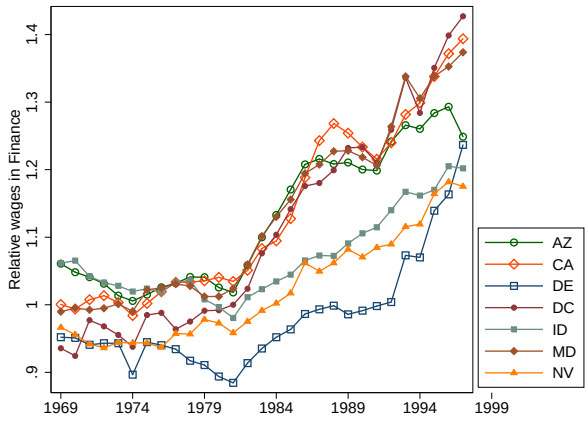
Table 3: Different Types of Bank Deregulation and Relative Wages in Financial Intermediation Subsector

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	I	II	III	IV	V	VI	VII	VIII
M&A deregulation	0.088***	-0.020*						
	(9.182)	(-1.680)						
Denovo deregulation			0.109***	0.002				
			(9.100)	(0.146)				
Interstate deregulation					0.104***	-0.007		
					(11.246)	(-0.757)		
Deregulation index							0.044***	-0.006
							(10.274)	(-0.982)
Observations	1,437	1,437	1,437	1,437	1,437	1,437	1,437	1,437
Number of statecode	51	51	51	51	51	51	51	51
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	No	Yes	No	Yes	No	Yes	No	Yes
R-Squared	0.635	0.850	0.641	0.848	0.711	0.848	0.695	0.849

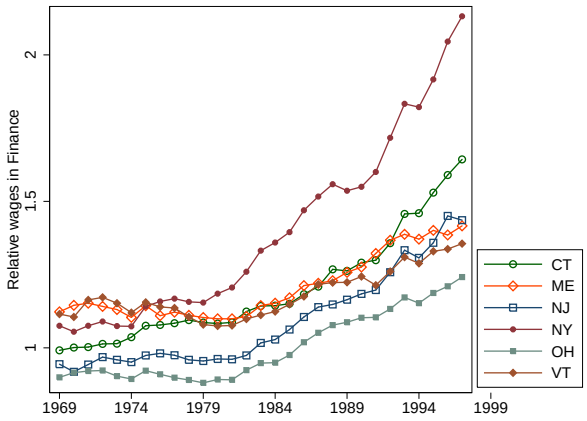
Notes: Each column in this table reports statistics from a fixed effect regression, where the dependent variable is the wages in financial intermediation industry relative to non-farm private industries. Average wages in each industry is calculated by dividing total compensation of employees over the number of employees. The difference between odd and even columns is that even columns include time fixed effects. The data is from 1969 to 1997 and includes 50 states plus District of Columbia. Standard errors are clustered at the state level. Values of t-statistics are in parentheses, where *** indicates significance at 1% level, ** indicates significance at 5% level and * indicates significance at 10% level.

Figure 1: Relative Finance Wages, by Deregulation Time

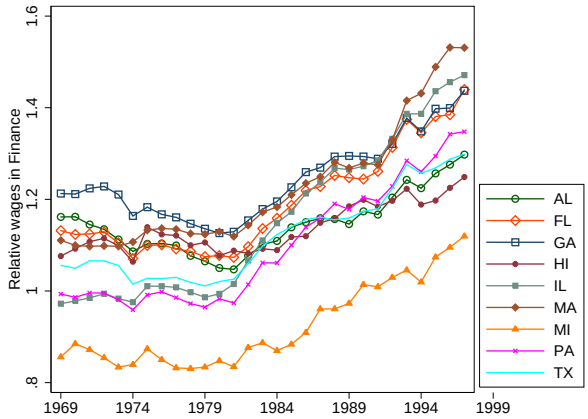
(a) Before 1970



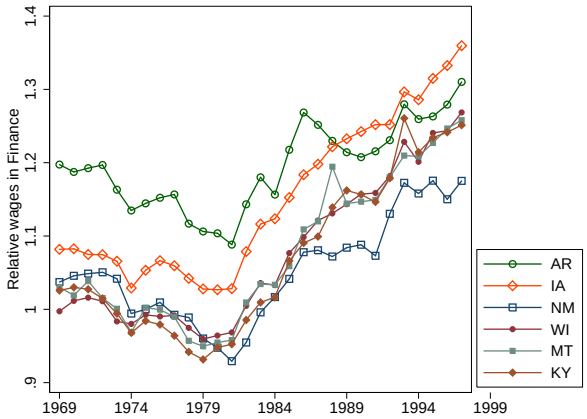
(b) Between 1970 and 1980



(c) Between 1980 and 1990



(d) After 1990



Notes: The graphs show relative wages in finance compared to other nonfarm private industry for each state, which are categorized based on their period of deregulation. Average wages in each industry is calculated by dividing total compensation in that industry over the number of employees. The raw data is from 1969 to 1997 and the source is the US Bureau of Economic Analysis.