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Summaries of Doctoral Dissertations

Foreign Exchange Reserves, Financial Instability, and Contagion: Three Essays on the Great Depression

Over more than eight decades, the international monetary and financial system of the interwar years has been a privileged field of study for economists and economic historians. The interwar saw the most global financial crash of modern history and scholars have studied this period extensively. Nevertheless, several important questions have remained unanswered in the literature on the Depression. This dissertation is a collection of three essays, all dealing with unexplored aspects of financial instability during the late 1920s and 1930s. The common purpose of these essays is to identify the various credit channels through which current account imbalances cleared in the international financial system on the eve of the Depression as well as to explore the consequences of the collapse of this credit structure during the global crisis of the 1930s. The dissertation emphasizes the role of foreign exchange reserves (chapter 1), international banking (chapter 2), and cross-country capital flows (chapter 3) in the propagation and deepening of the global financial crash. This research also brings new historical perspectives to current policy issues surrounding the recent financial crisis.

The first chapter revisits the French international reserves policy of the interwar years. France was a major player in the international monetary system of this period. At the end of the 1920s, it held more than half of the world's volume of foreign reserves. The French reserves policy of 1928–1932 has been heavily criticized in the literature. British contemporaries accused France of deliberately weakening the pound sterling on the foreign exchange market.[1] Other scholars have noted that the accumulation of gold by France (mostly caused by conversions of foreign exchange reserves into gold) put intense deflationary pressures on other countries on the gold standard and heavily contributed to the Great Depression.[2] Why did France engage in a policy which had such dramatic consequences? The purpose of this chapter is to identify the motivations behind the Bank of France's reserves decisions. In order to do this, I rely on an original data set collected at the Bank of France's archives and documenting the currency composition of the foreign reserves at a monthly frequency from 1928 to 1936. I then combine this information with market indicators of the perceived risk on reserve currencies (derived from forward exchange rates quotations). The analysis reveals how the institutional setup of monetary policy influenced the Bank of France's decisions. The Bank's reserves policy of 1928–1932 can be interpreted as the portfolio choice of a big player on the foreign exchange market. Given its private bank, low-capital status, the Bank's primary goal was to avoid

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He wrote his dissertation at the Institut d'Etudes Politiques de Paris under the supervision of Marc Flandreau.

[1] Einzig, *Tragedy*.

[2] Nurkse, *International Currency Experience*; Eichengreen, *Golden Fetters*; Johnson, *Gold, France*; and Bernanke and Mihov, "Deflation and Monetary Contraction."

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capital losses on its foreign portfolio. The most important factor, then, in its allocation decisions was the exchange risk on reserve currencies. The French international reserves were allocated between sterling, dollar, and gold. But in the late 1920s and early 1930s, the gold adherence of the two reserve currencies was put into question. Forward exchange rates reveal that there were growing fears over the pound's future on the market between 1929 and 1931. Fearing a pound's devaluation, the Bank of France decided to get rid of its sterling holdings and reallocated its portfolio in favor of the dollar. After the sterling crisis of September 1931 though, the credibility of the U.S. currency was in turn shaken. The Bank's policy therefore turned to a complete liquidation of its foreign assets and dollar holdings were massively converted into gold at the Federal Reserve. However, in implementing its portfolio choices, the Bank of France was also always constrained by its position as a big player on the exchange market. The huge volume of its foreign assets meant that it had to take account of the repercussions of its own actions on the exchange rates. In particular, as the pound's weakness worsened between November 1930 and September 1931, the Bank realized it could not maintain its sterling liquidations without provoking a pound's collapse and a huge exchange loss for itself. The only option left for the Bank was therefore to support the pound. French monetary authorities therefore turned cooperative: they granted a credit to the Bank of England and even directly bought pounds on the market. When the United Kingdom eventually left the gold standard in September 1931, the Bank of France had to register a huge capital loss which put it into a state of bankruptcy.[3] The Bank had to be rescued by the French Treasury, at the price of huge concessions. In the final months before the pound's collapse, the Bank of France was therefore caught into a "Sterling Trap." The episode has implications for today: it reminds that when there is growing risk on reserve currencies, foreign exchange reserves can be both a threat to the international monetary system, and a burden for big holders.[4]

The second chapter of the dissertation explores the role of international contagion in the 1931 global financial crisis and, in particular, in the famous sterling crisis of September. The sterling crisis was a critical event in the progress of the Great Depression and had worldwide consequences.[5] In its aftermath, many countries followed Britain off gold and the gold exchange standard system collapsed. Economists and historians have emphasized different causes for explaining the crisis: the pound's overvaluation,[6] Britain's fiscal deficit,[7] and the high unemployment rate.[8] Many authors have also noticed that the speculative attack on sterling began just after a wave of banking panics and currency troubles in Central Europe, initiated by the failure of the Austrian Credit Anstalt in May 1931 and culminating with the introduction of capital controls by Germany in July of the same year. However, while this chronology clearly suggests that international contagion was an important factor, little evidence has been advanced in the literature on how the crisis actually propagated. Several historians have argued that international banking connections were crucial in transmitting the troubles as British banks were heavily involved in

[3] See Mouré, *Managing the Franc* and *Gold Standard Illusion*.
[4] A revised version of this chapter has been published in Accominotti, "Sterling Trap."
[5] See Cairncross and Eichengreen, *Sterling in Decline*; and Eichengreen, *Golden Fetters*.
[6] Moggridge, *British Monetary Policy*.
[7] Williamson, *National Crisis*.
[8] Eichengreen and Jeanne, "Currency Crisis."

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Germany.[9] Other authors have emphasized that the Central European panic was at the origin of a confidence crisis in the international monetary system, triggering a general scramble for gold detrimental to the pound sterling.[10] This chapter revisits this issue by examining how the Central European crisis of the spring and summer of 1931 affected British banks. For this purpose, I rely on new archival data documenting London banks' balance sheets during the 1920s and 1930s as well as their exposure to Central Europe. This data set allows quantifying for the first time the position of the City of London in the crucial months from July to September 1931. I show that the German crisis seriously weakened the British banks' position: the banking system, therefore, was an important channel of crisis transmission. In particular, the crisis affected a specific segment of the London market: the merchant banks (or accepting houses). These banks were mostly specialized in trade finance: they accepted/guaranteed bills of exchange/bankers' acceptances on account of foreign merchants so as to allow them to borrow on the London discount market. In the 1920s, due to the recovery of world trade, the acceptance business considerably grew in volume. But the Central European crisis and the introduction of exchange restrictions by Austria, Germany, and Hungary in the summer of 1931 put a sudden halt to the merchant banks' prosperity. Since the foreign exchange markets were closed, all debtors from these countries became suddenly unable to transfer funds to the United Kingdom. The Standstill agreements resulted in the freezing of all Central European short-term debts and the liability for these debts therefore fell upon the merchant banks in London which had guaranteed them. Institutions having insured large amounts of debts for Central European customers were gravely affected. Indeed, I show that many of the merchant banks were in serious troubles as a consequence of this situation. The German panic resulted in a run on these banks' deposits and they reacted by selling off their liquid assets so as to shrink their balance sheets. I then explore how the Bank of England's reaction to the situation contributed to transform the liquidity crisis into a currency crisis. The 1931 episode therefore echoes the recent global financial crisis, where international banking interdependencies and credit insurance instruments (in particular, credit default swaps) also contributed to the propagation and amplification of the financial troubles.

The third chapter relates the propagation of the financial crash of the 1930s to the movements of capital flows between countries. It argues that financial crises propagated asymmetrically during the Great Depression. The chapter relies on an extensive monthly data set documenting exchange market pressure, sovereign bond spreads, and stock market returns for close to thirty countries in the 1920s and 1930s. This data set is used to identify the most global shocks of the period affecting each of the three markets. Results of a Principal Component Analysis reveal that the 1931 financial crisis accounts for most of the comovement in the different countries' financial series during the period: this crisis, therefore, was the most global of the Great Depression. However, the results also reveal that the impact of the global crisis was heterogenous across countries. Although there was a common response of all national stock markets to the global shock, a few countries (France, the Netherlands, and Switzerland) were able to resist on the foreign exchange and sovereign bond markets and they even benefited from the crisis: they experienced pressure to revalue their currencies as well as a decline in default risk on their government debts. The

[9] Morton, *British Finance*; Williams, "1931 Financial Crisis"; Sayers, *Bank of England*; Temin, "Transmission" and James, *End of Globalization* and *Creation and Destruction*.

[10] Capie, Mills, and Wood, "What Happened in 1931?"; and Billings and Capie, "Financial Crisis."

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resistant countries, I argue, were in fact the biggest capital exporters of the 1920s. The late 1920s and early 1930s were indeed marked by a reversal in international capital flows. A flight to safety and liquidity induced international investors to repatriate their claims from abroad. In this context, all countries which were previously relying on capital imports to finance their current account deficits fell prey to speculative attacks on their currencies. The sudden stop in capital flows was also accompanied by real exchange rate depreciation for the capital importers, which contributed to increase the risk on their foreign currency denominated government debt.[11] By contrast, the net exporters of capital of the 1920s started attracting capital as of 1931 as investors in these countries shifted their portfolios towards domestic claims. This explains these countries' resistance to contagion in the midst of the global financial crisis. The developments of the early 1930s therefore illustrate the vulnerability of countries running large current account deficits in the event of a global financial crisis.

[11] This mechanism has been described by Calvo, "Capital Flows"; and Calvo, Izquierdo, and Talvi, "Sudden Stops."

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Trading and Financial Market Efficiency in Eighteenth-Century Holland

Leafing through the financial section of a newspaper, it is impossible to overlook the columns filled with information about the price movements of stocks, bonds,

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and exchange rates and the approximate reasons for the observed fluctuations. Unfortunately, the newspaper can tell us very little about what precisely drives markets. On the trading floors of exchanges (or in the computer systems of electronic markets), a multitude of small processes take place that eventually result in the final movements that make the financial sections of newspapers. In recent decades, a burgeoning literature has arisen on this microstructure aspect of financial markets.[1]

One of the most important questions this literature tries to explain is how price fluctuations in financial markets are driven by information. Prices can impound information through the arrival of public news or through the revelation of private information in the trading process. It is a challenge to identify how these two factors have an impact on price dynamics in modern financial markets. Although modern data sets contain a lot of information, a number of important variables are often imperfectly observed.

First of all, it is difficult to adequately measure the flow of public information. There is so much information floating around in this age of advanced communication technology that it is hard to determine when a certain piece of information reaches the market. In addition, with the multitude of news items available it is often unclear to the outside observer to know (ex ante) what is relevant and what is not.

Secondly, private information is by definition unobserved and it is generally impossible to study the behavior of investors with access to privileged information. Our empirical knowledge about the impact of private information is therefore based on indirect evidence that can be inferred from anonymous transaction data. It is still an open question how informed trades influence the dynamics of prices and how they affect the market as a whole.[2]

Going back to history can go a long way in solving the problems that beset studies of modern financial markets. I turn to a unique natural experiment from the eighteenth century to shed more light on the impact of information on asset prices. The first chapter of my thesis deals with the impact of public information on stock prices. During the eighteenth century, the shares of a number of British companies were actively traded in Amsterdam.[3] This city was the most important financial market of the period and featured an active trade in the "English funds." For a number of specific periods within the eighteenth century (specifically 1771–1777 and 1783–1787; the periods studied in this thesis), all relevant information about these British stocks originated in London.

The English news arrived in Amsterdam through so-called mail packet boats that normally sailed twice a week between Holland and England.[4] Since these boats were sailing ships, the time it took them to cross the North Sea could differ greatly, as their speed depended crucially on the direction of the wind. The arrival dates of these ships were recorded in the newspapers of the time and this makes it possible to perfectly identify the arrival of news in Amsterdam. Together with data on stock prices in Amsterdam, this information provides a unique opportunity to study the impact of the arrival of news.

The second chapter of my thesis deals with private information or insider trading. These mail packet boats did not only bring public news from London but also carried private letters. There is evidence that these letters could contain inside

[1] See O'Hara, *Market Microstructure*; Vives, *Information and Learning*; Hasbrouck, *Empirical Market*; and references therein

[2] See Hasbrouck, *Empirical Market*, for an overview.

[3] Neal, *Rise of Financial Capitalism*.

[4] Hemmeon, *History of British Post Office*.

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information about the English stocks. An informed party in London would inform his agent to trade in his name.[5] It is likely that it might have taken multiple days for this information to be revealed into prices.[6]

This historical setting provides a unique opportunity to study how this inside information is impounded into prices. I compare price developments in Amsterdam and London. I show that prices in Amsterdam and London tended to move in the same direction, even if no boat was actually sailing between the two markets. This comovement was also present in periods of particularly bad weather during which I am pretty certain that no other boats could have been able to sail across. This points to the presence of private information that is slowly revealed in both places.

Apart from the impact of information, a second important issue in the market microstructure literature is how prices are affected by shifts in the demand for an asset, often coined liquidity shocks. One of the most important purposes of financial markets is to provide liquidity. In a perfect world, an investor would be able to trade at his own convenience and the market as whole would accommodate his demand for liquidity at the right (or fundamental) price.[7] However, recent evidence suggests that markets do not always function this way. Markets can have serious problems in accommodating large liquidity shocks of distressed traders and prices may adjust dramatically so that the market equilibrium is restored.[8]

It is difficult to study the exact mechanisms through which these liquidity shocks impact prices. For privacy reasons, modern data sets seldom feature detailed transaction data that would allow for a reconstruction of the transactions of distressed traders.

In the third chapter of my thesis (joint with Hans-Joachim Voth), we again use data from the financial market in Amsterdam during the eighteenth century. Through extensive archival research, we reconstruct the development of stock prices and trading activity after two episodes of distressed trading that took place in Amsterdam in 1772 and 1773. We are able to track the actions of the *dramatis personae* involved in these two events and we provide unique insights on how liquidity shocks affect markets and prices.

Throughout these three chapters, my thesis demonstrates that historical data can be successfully used to answer important questions from the modern finance literature. Historical idiosyncrasies, such as the way news was transmitted, and the non-anonymity of the sources provide unique opportunities to significantly supplement studies using data from today's markets.

[5] Sutherland, *East India Company*.
[6] Kyle, "Continuous Auctions."
[7] Scholes, "Market for Securities."
[8] See Duffie, "Asset Price Dynamics"; and references therein.

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Essays on Industrial Productivity in Twentieth-Century China

My dissertation contains three essays, each of which uses firm-level panel data to explain productivity dispersion in Chinese manufacturing firms during different periods of the twentieth century. The essays seek to explain why productivity growth rates in Chinese industry varied across time periods and why productivity growth rates in China differed from those in neighboring countries. I discuss each essay chronologically, and use this chronology to review changes in China's institutional environment which play a central role in all three of my papers.

My first paper examines Japanese, British, and Chinese competition in the 1920s and 1930s Chinese textile industry. During this period, the Japanese textile industry rapidly caught up with Western countries in terms of productivity, while other developing countries, such as China and India, were less successful.

My investigation of Japanese-owned textile plants in China provides some clues about the sources of rapid productivity growth in Japan and inferior industrial performance in China. I use published panel data on China-based textile firms to compare total factor productivity at Japanese-, British-, and Chinese-owned plants in China with that of Japan-based plants. Japanese-owned plants obtained similar

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productivity levels and productivity growth rates, regardless of whether they were located in Japan or China. This provides a strong indication that productivity growth was due to improvements in Japanese management, rather than due to the quality of Japanese labor. By contrast, British- and Chinese-owned firms performed poorly, obtaining productivity levels only half of those at Japanese-owned firms. The weak position of British-owned firms is particularly surprising given that contemporaneous firms in Britain were extremely productive domestically.

What explains this dramatic difference in performance across ownership groups? Why were Japanese-owned firms so much better at transferring technology to China than British-owned firms? Japanese-owned firms used the same types of machines and workers as British- and Chinese-owned firms and were located in the same cities, so factors related to capital or labor quality cannot explain their dramatic success. Instead, the answer lies in complementarity between firm-level management practices and national institutions. Japanese owners benefited from a centralized organizational system that addressed problems of corruption and racketeering affecting Chinese labor markets. British- and Chinese-owners used a different set of practices which, while similar to practices that worked well in Britain, did not yield good results in a corrupt environment.

British- and Chinese-owned firms utilized a highly decentralized hiring system in which supervisors personally selected teams of employees to work under them. In China, employees issued a customary annual payment to supervisors who helped them obtain jobs. These payments encouraged supervisors to hire more workers than necessary, reducing labor productivity. While managers tried to discourage excessive hiring by dismissing problematic supervisors, managerial authority was greatly limited by the activities of a massive criminal network known as the Green Gang, which represented supervisory interests. The Green Gang organized strikes, political unrest, and vandalism to punish managerial attempts at limiting supervisory control. Simultaneously, the gang employed blacklists and intimidation to discipline workers who tried to obtain jobs by soliciting management directly.

From the time of their initial entry in China, Japanese-owned firms implemented a centralized system of hiring and training characteristic of large textile firms in Japan. Human resources departments in Japanese-owned firms controlled procedures for hiring, training, job assignment, and dismissal. Assigning control over hiring to a specialized bureaucratic agency greatly limited supervisor's ability to extract bribes from workers. Having dealt with the bribery system and thus the source of organized opposition to labor productivity increases, Japanese-owned firms were able to motivate dramatic increases in work effort by offering workers relatively small increases in wages.

Particularly during the 1930s, some Chinese-owned plants made successful efforts to adopt Japanese practices, while others were unable to do so in the face of militant resistance from supervisors. Additional quantitative evidence linking management practices to firm productivity comes from analysis of these reform efforts. I hypothesize that successful adoption of Japanese practices should lead to large increases in productivity. I substantiate this claim through collection of a cross-sectional survey that records data on both productivity and management practices at Chinese- and British-owned plants. As expected, productivity and management practices were strongly linked, while other factors such as the quality of a plant's machinery played no significant role. In addition, I also build on Sherman Cochran's case study of management reform at the largest Chinese-owned firm.[1] By linking

[1] Cochran, *Encountering Chinese Networks*.

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plant-level panel data to Cochran's descriptions of sequential reforms of this firm's plants, I show that plant-level reforms coincided with dramatic improvements in plant-level productivity.

The second paper in my dissertation explores productivity growth in Chinese manufacturing during the 1950s, 1960s, and 1970s. When China moved from a market system to a planned economy in 1949, productivity growth rates in manufacturing accelerated dramatically. During the 1960s and 1970s, however, productivity growth rates stagnated. In fact, manufacturing productivity levels in 1978 may have been lower than those in 1957.

I hypothesize that this dramatic shift in productivity trends is related to changes in China's trading relations with more technologically advanced countries. During the 1950s most Chinese industrial equipment and plant designs were imported from the Soviet Union. In the late 1950s the Sino-Soviet relationship deteriorated, leading to a near complete cessation of imports of Soviet technology goods. In response, China attempted to enhance trading relations with Western Europe and Japan, but these overtures were stymied by Cold War politics. During the 1960s to mid-1970s China was largely isolated from international trade in technology. The majority of capital goods installed in China during the 1960s and 1970s came from domestic sources. My paper shows that the exceptionally low quality of these domestically produced capital goods was perhaps the most important reason for deterioration in performance at Chinese industrial facilities.

In the first part of this paper, I look at trends in Chinese technological development during the initial years of Communist rule. Soviet technological aid and equipment exports to China were almost exclusively focused on the development of heavy industry. Investment in light industry was not a priority of the Maoist regime because of their overwhelming concern with preparation for a possible war with the West. If Soviet technological aid played a key role in China's productivity boom during the 1950s, one would expect heavy industrial sectors to be the main beneficiaries. To confirm this, I calculate sector-level productivity growth rates in both heavy and light industry. In heavy industry, which I define as sectors with higher than average capital intensity, annual productivity growth rates in the period between 1952 and 1957 were on average 12 percent. By contrast, in light industry, productivity growth rates over the same period averaged only 2 percent.

The second part of this paper focuses on the downturn in productivity that occurred during the 1960s and 1970s. To test my hypothesis that this downturn was related to trade in equipment, I analyze a set of annual plant-level panel data for the iron and steel sector which spans the period from 1949 to 1978. As in other heavy industrial sectors, total factor productivity in iron and steel increased exceptionally rapidly between 1952 and 1957, but declined between 1957 and 1978. A plausible explanation for this trend shift is a change in the sourcing of iron and steel technology. Chinese iron and steel facilities constructed between 1949 and 1957 used imported Soviet or Eastern European equipment almost exclusively. In addition, the initial designs for these plants, the installation of their equipment, and the training of their personnel all benefited from the assistance of large teams of Soviet engineers and geologists resident in China. By contrast, facilities constructed after 1960 relied on domestic equipment and domestic scientific expertise.

To assess how equipment and technology imports affected productivity in the iron and steel sector, I estimate a gross revenue production function in which the share of investment occurring during the Soviet-aid period enters as a productivity determinant. I use two possible sources of identification here. The first possible source comes from

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productivity differences across plants. This is the primary source of identification in a pooled cross-sectional regression. The second possible source comes from variation in the productivity of older plants over time. As older plants are expanded using domestically produced equipment, their productivity should decline. This is the primary source of identification in a fixed-effects regression.

Using either source of identification, I find that lack of access to Soviet supplied capital goods and services had a catastrophic negative effect on total factor productivity. According to my results, a purely Soviet-supplied plant had an average total factor productivity level twofold to threefold greater than that of a purely domestically supplied plant. The difference in total factor productivity was primarily due to low material use efficiency. Relative to Soviet-equipped factories, domestically equipped factories used tremendous amounts of material inputs in each stage of production. Domestic factories also often produced substandard outputs which reentered the production process as inputs. This led to further wastage of materials.

An implication of this study is that China's economy was heavily constrained by lack of access to technologically sophisticated imports during the 1960s and 1970s. Even in the absence of other institutional changes in the economy, normalization of China's trading relations with the capitalist world in the late 1970s would likely have been sufficient to dramatically improve productivity growth rates in Chinese manufacturing.

The third essay in my dissertation examines the 1978 introduction of managerial and worker incentives in Chinese state-owned enterprises. During the 1960s and 1970s Chinese state-owned enterprises operated under an extremely egalitarian compensation regime. Under this system, the year of workforce entry and the status of the enterprise one worked for almost completely determined compensation. In addition, dismissal from a state-owned enterprise could only occur for political reasons or in cases of criminal behavior. In 1978, seeking to improve industrial performance, the Chinese government initiated a bonus scheme which linked the compensation of managers and workers to measures of individual and collective performance.

Briefly, incentive reforms worked as follows. Provincial governments established performance targets for state-owned enterprises under their supervision. Typically, the targets were based on enterprises' average profitability over the past three years. The enterprise was asked to submit an amount of profit equal to this historical average to the provincial government. A portion of any profits in excess of this target was retained by the enterprise and used to fund a bonus pool for managers and workers. Distributions from the bonus pool to individuals were supposed to be based on quantitative measures of individual performance. However, in practice, worker opposition to wage inequality meant that the division of bonuses within enterprises was not entirely based on individual performance.

Previous studies have argued that the introduction of incentives led to large increases in work effort and productivity. These authors demonstrate that contemporaneous measures of firm-level productivity and the amount of bonuses distributed are positively correlated. However, there are good reasons to be skeptical of their methodology and interpretation. Positive correlation between productivity and bonus distribution is almost certainly due at least in part to reverse causation. Identification requires an instrument, that is, a source in variation in bonus use which is not related to ex-post realizations of firm performance.

More interestingly, past studies ignore potential adverse effects of the incentive system on the horizon of managerial decision making. The incentive system linked

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compensation to contemporaneous profit maximization, whereas the central planner's objective was likely maximization of enterprise value. During the late 1980s and early 1990s Chinese government publications covering a wide range of industries reported that the incentive system encouraged mangers to make shortsighted decisions, such as neglecting technological development, failing to maintain capital equipment, failing to adequately train newly hired workers, and selling substandard products that damaged the enterprise's brand. These types of short-run behaviors could cause incentive use to have a negative effect on long-run enterprise performance. To allow for this type of effect, assessments of incentive systems should consider both the short-run and long-run relationship between incentive use and productivity, rather than just the contemporaneous relationship between bonus use and productivity.

To investigate how bonus use affected productivity in Chinese SOEs, I collect a unique panel of compensation, employment, and output statistics for the population of Chinese iron and steel enterprises and use these data to estimate the short- and long-run effects of incentive use on labor productivity during the early period of SOE reform, 1976 to 1988. I use two sources of plausibly exogenous variation in incentive use to identify effects. The first source is the firm-level timing of incentive adoption. The second source is cross-province variation in the intensity of incentives. Provincial governments had significant autonomy with respect to compensation policy. This autonomy led to plausibly exogenous variation in the share of incentive pay in wages across provinces.

In 1978 the central government ordered provincial governments to select a subset of enterprises for early adoption of bonus pay. Theory predicts that these early adopters should have improved their comparative performance initially, both because of increases in their total effort levels and due to the diversion of their efforts to short-run goals. By the late 1980s the incentive system was applied universally and there were no longer significant differences in the propensity of early and late adopters to use bonuses. Here, theory predicts that effort levels in both groups of enterprises should be similar. However, if it is true that incentives have negative long-run consequences, one would expect the group which adopted incentives first to perform more poorly.

I use a matching estimator to compare the evolution of labor productivity in early and late adopters between 1978 and 1988. I find a positive, but statistically insignificant, short-run effect on labor productivity levels in early adopters during the late 1970s. During the mid to late 1980s I find a negative and statistically significant deficit in labor productivity growth in early adopters. The long-run negative effect is severalfold larger in magnitude than the short-run positive effect. Contrary to previous studies, my results suggest that incentive introduction had a negative, long-run effect on state-owned enterprise performance.

In the second identification approach, I use cross-province heterogeneity in the magnitude of productivity effects associated with bonus adoption as a source of identification. In provinces that permitted enterprises to issue larger amounts of incentives, both the positive short-run and negative long-run productivity effects of incentive adoption should be larger in magnitude. This variation in magnitude provides a method of identifying incentive effects. Estimates of bonus effects based on this approach also indicate small, positive short-run effects and large, negative long-run effects. However, in this case both the short-run and the long-run effects are statistically significant.

This third essay is largely empirical in focus rather than concerned with the development of a historical narrative. However, taken together with the second essay

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it has significant implications for interpretation of China's long-run development since 1978. Beginning in 1978 China embarked on a set of policy changes known as "reform and opening." In industry, the most important aspects of early "reforms" were a partial liberalization of price setting, expansion of enterprise autonomy, and the introduction of incentives linking pay to performance in state-owned enterprises. A large literature in economics focuses on analysis of these "reforms" as sources of industrial productivity growth. "Opening" involved a dramatic expansion of trade and in particular imports of industrial technologies from the United States, Europe, and Japan. The effects of China's initial "opening" during the 1980s have not been well-explored by economists. Findings in my second and third essays suggest that measurement of the effects of "opening" is an important direction for future research.

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Housing Markets, Government Programs, and Race During the Great Depression

The housing market was among the markets hit hardest by the Great Depression as home ownership rates fell sharply and housing prices plummeted. The black population experienced more than their share of unemployment and reduction in wages. With the advent of the New Deal in 1933, the Roosevelt administration sought to prop up the housing market and improve the quality of housing with several programs, including the Home Owners' Loan Corporation (HOLC), the Federal Housing Administration (FHA), and the construction of new public housing projects. In the process, the federal government sought to make the administration of such programs color-blind. I examine how blacks and white fared in housing markets during the Great Depression, the impact of race and migration on neighborhood housing values, and the impact of the introduction of public housing on neighborhoods using a series of new data sets that I have compiled from both new sources and the United States Bureau of the Census and other databases.

As African Americans began to migrate from the South during World War I, whites were concerned over the impact their migration would have on housing values. To raise "awareness" of the growing threat of African American migration, organizations such as The United Welfare Association distributed pamphlets in the 1910s that stated bluntly, "DO YOU REALIZE that at any time you are liable to suffer an irreparable loss, due to the coming of NEGROES into the block in which you live or in which you own property?"[1]

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Bowing to growing concern about the influence of African American's "infiltration" on white communities, several cities passed racial zoning ordinances in the 1910s. These ordinances were designed to prohibit African Americans from purchasing properties in predominately white neighborhoods and vice versa.[2] Racial restrictive deed covenants were an alternative mechanism to the racial zoning ordinances. While estimates of the breadth of restrictive deed covenants estimates vary, the coverage in Chicago was estimated at up to 85 percent of the city and 80 percent of new developments in Saint Louis.[3]

Homer Hoyt, an economist for the Federal Housing Administration, argued in his 1939 book, *The Structure and Growth of Residential Neighborhoods in American Cities*, that the influence of African Americans tends to have a "depressing effect upon land values." My chapter entitled, "The Impact of African American Migration on Housing in New York City," explores whether the migration of African Americans into a neighborhood had the deleterious influence on housing values suggested by the myriad of real estate agents, economists, and financial institutions of the period.

I examine the influence of African American in-migration on housing values using a data set from the 1938 City Survey of New York City conducted by the HOLC. As migration decisions are endogenous, I use a 5 percent sample of the 1930 United States Census to construct an instrument that combines information on outflows of black migrants from other states to New York with neighborhood-level data on the birth states of African Americans living in New York City. The strength of this instrument comes from the propensity for people to migrate to areas with preexisting populations of their peers. The data also exhibits evidence of spatial dependence, therefore I use a spatial two-stage least squares estimator described in Luc Anselin and Nancy Lozano-Gracia.[4]

The results show that initially, African American in-migration led to an increase in the housing values in New York City during the Great Depression. Only after African Americans in a neighborhood exceeded a third of the population did housing values begin to decline. This result suggests that neighborhoods began to "tip" at this threshold as whites left the neighborhood.

The Great Depression was also a period of increased involvement in the housing market by the federal government. While farm mortgage loans were available since 1916, the federal government's involvement in the housing market began during the Great Depression. Several programs were developed to assist different aspects of the housing market. The FHA was established to increase liquidity in the financial market by lowering the risk for financial institutions to lend by providing mortgage insurance, the HOLC was responsible for refinancing mortgages in danger of foreclosure, and the Housing Division within the Public Works Administration (PWA) was created to provide loans and oversee the construction of public housing projects.

The Emergency Farm Mortgage Act of 1933 was established to assist farmers who became delinquent on their loans while the Agricultural Adjustment Act was passed to help farmers by raising food commodity prices. States also passed mortgage moratoria laws which either restricted mortgages from foreclosure or lengthened the foreclosure period. In addition, President Roosevelt signed The Bankhead-Jones Farm Tenant Act of 1937 which created the Farm Security Administration to reduce persistent poverty in rural areas.

[1] Gordon, *Mapping Decline*, p. 70.
[2] Ibid., pp. 70–71.
[3] Brooks, "Covenants & Conventions"; and Gordon, *Mapping Decline*.
[4] "Errors in Variables."

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Several researchers have argued that the federal government implemented racially discriminatory practices as part of their policies. Charles Abrams wrote in *Forbidden Neighbors* that the FHA "set itself up as the protector of the all-white neighborhood. It sent its agents into the field to keep Negroes and other minorities from buying homes in white neighborhoods. It exerted pressure against builders who dared to build for minorities, and against lenders willing to lend on mortgages."[5] The Agricultural Adjustment Administration (AAA) has also been targeted by critics who have argued that it was detrimental to African American farmers.[6]

I explore these claims in my next chapter entitled, "The New Deal, Race, and Housing in the 1930s." The analysis sheds light on these issues by examining the role of federal spending on households' tenure choice, the values of owner-occupied dwellings, and contract rents. I use a data set which consists of a pseudo-panel of households compiled from repeated cross-sections of the 1 percent sample of the Integrated Public Use Microdata Series (IPUMS) from 1920 through 1940. This data is matched to information on government programs and market-level characteristics for 460 U.S. housing markets. The effects of government programs on rents and housing values are estimated after controlling for selection into renting or owning using a two-step Heckman selection model.

My findings suggest that among the New Deal programs geared towards nonfarm households, the FHA was the only program that had a positive and statistically significant influence on the probability of home ownership for both white and black households. The net effect among white households exceeds the results found for black households, which lends support to the hypothesis that the FHA had discriminated against black homeowners. However, the positive effect on black home ownership is a far cry from the effect on home ownership suggested by Abrams.[7]

Programs such as the HOLC appear to have had little statistically significant effects on home ownership rates. This counters previous findings of both Charles Courtemanche and Kenneth Snowden and Price V. Fishback et al., which find that the HOLC had a positive influence on home ownership rates, although these findings were limited to areas outside of the largest cities.[8]

Among farm programs, AAA grants are negatively associated with the home ownership rates among white farmers, but they had no statistically significant effect on the rate for black farmers. The results appear consistent with previous findings which had shown that the AAA spurred tenant displacement and black out-migration from the rural south. However, the grants appeared to have led to a subsequent decline in owner-occupied properties while subsequently increasing contract rents for both black and white farmers. Mortgage moratorium laws were associated with an increase in white farmers' home ownership rates. Consistent with the idea that swing states appeared to cater to farmers, this effect suggests that farmers played an important role in developing New Deal policy during the Great Depression.

Out of the programs created during the Great Depression, the introduction of public housing has been one of the most controversial. Housing conditions for low-income families during the nineteenth and the first few decades of the twentieth centuries were generally poor. Edith Elmer Wood argues that as many as a third of all families across

[5] Abrams, *Forbidden Neighbors*, pp. 229–30.

[6] See Whatley, "Labor for the Picking"; and Myrdal, *American Dilemma*, pp. 259–61.

[7] *Forbidden Neighbors*.

[8] Courtemanche and Snowden, "Repairing a Mortgage Crisis"; and Fishback et al., "Influence of the Home Owners'."

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the United States resided in housing that was overcrowded and had insufficient light and water.[9] She argued that many dwellings were dilapidated and prone to fire, while several cholera epidemics ravaged cities as a result of crowded living conditions.

President Roosevelt signed the National Industrial Recovery Act in 1933 which authorized the PWA to provide funds for low-cost and slum clearance projects.[10] This extended an earlier program under the direction of the Reconstruction Finance Corporation to provide loans to private limited-dividend corporations for construction of low-cost housing to the poor. As these programs were largely unsuccessful, the PWA began to directly manage and construct public housing projects in cities across the United States. With the creation of the United States Housing Authority (USHA) in 1937, the federal government was firmly entrenched in the creation of public housing for low-income households.

The goals of housing projects were to clear out cities' slums. The first public housing projects were typically designed to significantly improve the living conditions of low-income households. However, the USHA was increasingly concerned about the construction costs of these housing projects. Richard Plunz states that to reduce costs in the Red Hook Houses, the first USHA project in New York City began to significantly cut construction quality in order to hit budgetary constraints.[11]

In my final chapter, "Built with Good Intentions? An Examination of Public Housing Projects on Local Communities," I explore how housing officials selected the location of public housing and then measure the effect of public housing on surrounding contract rents in New York City between 1934 and 1940. I constructed a unique data set of public housing projects in New York City and combine it with census tract-level data from the 1934 Real Property Inventory of New York City and the 1940 United States Census, the latter I had obtained from the National Historical Geographic Information System (NHGIS).

To determine how officials selected the locations of public housing, I ran several probit models and explored the average marginal effects across boroughs. In addition, I ran a series of hedonic models incorporating "locational heterogeneity," described in Antonio Páez, Takashi Uchida, and Kazuaki Miyamoto, to explore the influence of public housing on the distribution of contract rents in the surrounding communities.[12] These models use a locally linear estimator similar to Geographically Weighted Regressions, but they also allow the bandwidth to vary for each location.

I find that public housing in New York City was constructed in crowded neighborhoods in which families typically shared restroom facilities. Moreover, public housing was targeted in neighborhoods whose residents were largely reliant on public transportation. Building in neighborhoods with low property values appears to have been a relevant, but not an overwhelming factor. My findings suggest that public housing increased the distribution of contract rents. The magnitude of the effect also appeared to not dissipate as the distance to public housing increased. My results suggest that the early public housing projects constructed by the PWA led to greater spillovers in contract rents than the later projects constructed by the USHA. This may indicate that the cost-cutting measures of the USHA and future housing authorities paved the way for the eventual decline of public housing in cities.

[9] *Unskilled Wage Earner*, pp. 7–9.
[10] Committee on Banking and Currency, *Federal Housing Programs*.
[11] *History of Housing*, pp. 237–38.
[12] "General Framework."

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My thesis highlights that African Americans faced restrictions on where they could live through a variety of racial ordinances, restrictive covenants, harassment, and discrimination. This led African Americans to live in crowded conditions. As their swelling populations spilled into the neighboring communities, white families left the central city. The migration patterns may also have been influenced by the policies of the federal government to promote homogenous neighborhoods through selective mortgage insurance policies and by segregating families by race in public housing. The white flight to the suburbs may also have pushed more jobs to the suburbs, leading to African Americans increasingly being unable to find job opportunities. These factors could have led to persistent home ownership gap over the last century.

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Fertility Transition and Development in the United States, 1850–1920

The perennial question remains: why are some countries profusely rich while others linger in agonizing poverty? The names of the countries may change, but the asymmetry of modern economies in terms of average wealth, education, health, and fertility always startles. For instance, in 2008 the per capita GDP of the United States reached 46,350 dollars. The average level of education was slightly above 12 years and American women on average gave birth to about two children over their lifetimes. In contrast, the per capita GDP of Niger was just 364 dollars—less than 1 percent of the American figure. Nigeriens could expect to receive about one year of schooling, and, if they were women, they were likely to bear more than seven children during their lifetimes.

How did Americans break free from the Malthusian poverty trap of low growth and high fertility? Is there anything the Nigerien government can do to hasten the transition to self-sustained growth? As Nobel Laureate Robert E. Lucas, Jr. put it, "the consequences for human welfare involved in questions like these are simply staggering: once one starts to think about them, it is hard to think about anything else."[1]

Recent theories of economic development have focused on the fertility transition as a means to understanding the long-run development process. In particular, the "Unified Growth Theory" (UGT) has proposed a "time-series" approach to economic development.[2] Recognizing that development is a process, these theories have tried to find a *unified* model that can explain the three observed stages of economic development within a single framework. Initially, economies are trapped in what is called a "Malthusian" equilibrium. High fertility rates, subsistence wages, and slow technological progress all characterize this regime. In the intermediate stage, industrialization increases the demand for qualified workers and incomes increase. Fertility faces two opposing forces: on the one hand, income is higher, and because children are a normal good, families increase the consumption of them. On the other hand, there is a "quality-quantity" tradeoff in place.[3] The higher the number of children chosen, the lower the level of education each of them receives. As the demand for qualified workers increases, so does the skill premium and families find it optimal to substitute quality for quantity. As income continues to rise, income effects become less and less important. Fertility starts to decline, reinforcing the virtuous circle of education and income. The economy is now in the self-sustaining stage.

One of the most attractive features of the UGT is that it is an integrated framework that can explain long-run growth. While theoretically elegant, these models do not assume different production functions for rich and poor countries. Although the factor that triggers the transition to self-sustained growth differs among the different models, they all tend to focus on increasing returns to human capital. In the canonical UGT

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[1] Lucas, "Economic Development."

[2] Galor and Weil, "Population."

[3] As in Becker, *Treatise*; and Becker and Lewis, "Interaction."

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model—Galor and Weil, "Population, Technology, and Growth"—the transition is triggered by interactions between population size and technological progress. A population that grows slowly during the Malthusian period makes human capital investments more profitable. There is nothing unique about this factor; many other factors have been hypothesized as triggers, such as capital-skills complementarities, prolonged life expectancy, and even genetic evolution.[4]

More important in the context of UGTs are the processes that the trigger initiates. In particular, these models all predict that a "quantity-quality" tradeoff will unleash a demographic transition. As anticipated by the theory, every country that is now developed experienced a dramatic reduction in fertility and mortality shortly after takeoff. Furthermore, the sequential reductions in mortality first and fertility slightly later generate population dynamics that are consistent with the three typical stages of UGTs. Fertility rates are high but stagnant in the Malthusian period, grow in the transition period, and decline in the self-sustained stage, when substitution effects dominate. This pattern is similar to what demographers have found in historical demographic transitions and, especially, the European experience.[5]

This thesis revisits the "quantity-quality" tradeoff during the transition to self-sustained growth. I argue that the only way to disentangle causality in this context is by looking at the micro-evidence of how families reacted to sudden changes in the return to education. Did the families reduce their fertilities in response to increasing returns to human capital? What was the role of social policy and, in particular, Compulsory Schooling Laws (CSLs) and Child Labor Laws (CLLs) in the process? Did CSLs and CLLs induce changes in family decision making or technologies for production? Did they reflect passive adaptation to a changing environment?

In order to answer these questions, I look at the historical record of the United States between 1850 and 1920, when CSLs and CLLs were first enacted. I take advantage of the different timings of the legislations among the states in the Union. In order to maintain comparability between the "treated" and "control" groups, I use different identification strategies based on geography (chapters one and two) or technological dependence (chapter three).

The first chapter of this dissertation studies the effects of compulsory schooling laws on school enrollment and long-run educational attainment. The previous literature on compulsory schooling and school enrollment in the United States has been particularly skeptical about the effectiveness of state compulsory schooling regulations, at least for the nineteenth century. In this chapter, I show that the negative results obtained by previous researchers are due to the fact that the treatment and control groups in the analysis are not really comparable. I argue that, given the limited number of variables available for which the researcher can control, a reasonable option is to narrowly define similar treatment and control groups. I do so by restricting my attention to the evolution of enrollment in the vicinity of the state border where legislation changed. I find that there is a discernible effect both in short-run school enrollment and in educational achievement several decades after treatment. The effect occurs exactly for the ages covered by the law and precisely at the time when

[4] For a comprehensive summary of the UGT and the different "triggers" of self-sustained growth, see Galor, "Stagnation to Growth."

[5] The Princeton European Fertility Project (EFP) studied the pattern of fertility decline in Europe. See Coale and Watkins, *Decline of Fertility*, for the original conclusions and Brown and Guinnane, "Two Statistical Problems," for a methodological criticism.

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the legislation was passed. I interpret all of these findings as evidence that compulsory schooling increased enrollment in nineteenth-century America.

Chapter two focuses directly on the quantity-quality tradeoff. Economic theory argues that the effect of compulsory schooling on fertility depends on two opposing effects. On the one hand, there is a child labor effect. Insofar as compulsory schooling reduces the market value of children, we should expect these laws to promote a quantity-quality tradeoff. The opposing force would come from the implicit income transfer that compulsory—and free—education would mean for households. I argue that the first effect should dominate, and I study the change in the fertility behavior of households affected by the legislation. I find that a significant 15 percent decline in fertility over the period can be attributed to compulsory schooling legislation through the direct channel of family incentives. In the second part of the chapter, I study the indirect channel through the change in fertility choices of women who received education. I find that as a consequence of the compulsory schooling legislation, educated women bear between 0.15 and 0.3 fewer children.

In the third chapter—a joint project with Hans-Joachim Voth—we explore the effects of the introduction of child labor laws in the United States between 1899 and 1919. Using a newly collected data set of industrial statistics from the manufacturers' census of the United States, we consider industrial growth rates before and after the introduction of the legislation. Our identification strategy takes advantage of the fact that some industries were initially more dependent than others on child labor. We conjecture that these "child labor-dependent" industries should suffer a greater reduction in their growth rates upon the introduction of the child labor law. We test this hypothesis directly using different measures of child labor dependence and child labor law intensity, all with similar results. Despite being concentrated within a small group of highly dependent industries, child labor laws have a discernible, deleterious effect on industrial growth.

The three chapters of this thesis highlight the importance of social legislation in hastening development. They suggest that there are substantial returns to enforcing CSLs and CLLs across the developing world. However, they also imply that the short- run implementation of these policies may present complications. Despite the positive returns of these policies in the long run, the short run costs of implementing the laws may fall disproportionably on a few agents. Based on the historical case of a developing economy during its transition to self-sustained growth, my thesis supports the expansion of development programs that promote school enrollment and the eradication of child labor. It suggests that programs such as Brazil's *PETI* or Mexico's *Oportunidades* could hasten Nigerien development.

Another contribution of this thesis regards its novel approach to economic development. Throughout the three chapters, I stress the enormous possibilities of a "time-series" approach. The history of empirical development is one of cross-sectional regressions, in which all of the countries of the world are pooled at one moment in time. Needless to say, the differences between the United States and Uganda, Paraguay or Vietnam are multidimensional, making it hardly convincing that the researcher would be able to control for all of them in his regressions—even if he accounts for fixed effects. Instead, the time-series approach focuses on following a historical developing economy—like that of the United States in the 1900s—throughout the developmental process. The advantage of this approach is that it overcomes the intrinsic problems of comparing disparate countries at the same point in time by concentrating on a single economy through time.

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This approach is hardly a panacea and presents its own drawbacks: the world today is not the same as it was a century ago. A century ago, extended families with intricate intra-household bargaining strategies were common. Today, nuclear families live in suburban homes outside the metropolitan areas of Washington and Paris. For those of us who enjoy the comforts and amenities of a modern metropolis, the case for the time-series approach may seem a bit weak. However, from the perspective of developing economies, it is more reasonable. Such countries have limited access to basic commodities and services we associate with the modern world. Furthermore, in developing societies such as Niger's, "complex reciprocal family relationships provide solidarity between urban and rural areas, between households, between generations, and between groups with different levels of welfare. They help cope with crises, diffuse wealth and poverty[...]."[6] Seen in this light, Niger might not be so different from nineteenth-century America after all. Perhaps there are lessons to be learned from history that could provide hope for Niger.

[6] World Bank, "Niger Poverty Assessment."

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American Public Housing's Origins and Effects

The United States built approximately 1.1 million public housing units between 1933 and 1977.[1] This federally supported public housing program sought to eliminate unsafe housing conditions, eradicate slums, provide "decent" housing for low-income families, and stimulate local economic activity.[2] It was an ambitious effort to improve the physical environment in which the poor lived in the belief that doing so would directly benefit the poor and indirectly benefit local economies by dampening negative externalities associated with slums. Participation in the program was widespread and by 1970 nearly half (over 1,400) of the counties in the United States had built public housing.

By the mid-1970s, however, many believed that public housing had exacerbated the poverty and slum conditions that the program was meant to ameliorate, and political support for the program waned.[3] The federal government halted funding for new public housing projects and created a system of rent vouchers for low-income families ("Section 8"). The federal public housing program was an extraordinary and long-lived effort to improve housing conditions and neighborhood environments for the poor. However, the origins and diffusion patterns of public housing have not been well-documented and the effects of public housing are not well understood, especially earlier on.[4]

This dissertation documents the diffusion and effects of public housing during the period of the program's expansion, from 1933 to 1973. After a brief introduction in chapter I, I give a historical account of the origins and details of the public housing program (chapter II). The first federally funded low-income public housing came out of the New Deal, when the National Industrial Recovery Act (NIRA) gave the Housing Division of the Public Works Administration (PWA) the authority to build public housing. The program was continued through the Housing Acts of 1937 and 1949, among others, and one of the main differences between the PWA program and the public housing program that followed was that the 1937 Housing Act transferred the planning and construction of public housing projects to local Public Housing Authorities (PHAs). The program continued until the mid-1970s, at which point there was a policy shift away from the construction of low-income housing units, towards the provision of Section 8 housing vouchers.

To study the diffusion and effects of public housing during the period of the program's expansion, I compile a comprehensive data set of public housing diffusion covering the entire United States between 1933 and 1973 (chapter III). These data come from the *Consolidated Development Directory* (henceforth *CDD*), published by

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[1] U.S. Department of Housing and Urban Development, *Statistical Yearbook*.

[2] U.S. Housing and Home Finance Agency, *Federal Laws*.

[3] Husock, *Housing Mistake*; and Meehan, *Quality of Federal Policymaking*.

[4] Recent work has examined the effects of public housing on the concentration of poverty (e.g., Carter, Schill, and Wachter, "Polarization"; and Massey and Kanaiaupuni, "Public Housing"), property values (e.g., Lee, Culhane, and Wachter, "Differential Impacts"; and Rabiega, Lin, and Robinson, "Property Value Impacts") and education (e.g., Currie and Yelowitz, "Are Public Housing Projects?"; and Jacob, "Public Housing"). However, much of this work is for the 1990s or later and often for large cities.

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the U.S. Department of Housing and Urban Development in 1973. The *CDD* contains detailed information on the years of construction and availability of public housing projects, the number of units available, and the program under which projects were funded. I converted these data from microfiche into electronic format and, to the best of my knowledge, this is the first data set that comprehensively traces public housing from its inception in 1933 to its peak in the 1970s. Using this data, I find a great deal of interregional and intra-regional variation in the adoption and intensity of public housing programs during this period. The Northeast and the South were clear leaders in public housing participation, however participation in the Midwest and West also grew throughout the period.

Chapter IV takes a closer look at the diffusion of public housing by empirically assessing the preexisting community characteristics that were associated with rapid public housing adoption. I first adopt hazard models to identify the community characteristics that led some places to adopt public housing more quickly than others and then use OLS regression analysis to quantify the strength of the correlation between community characteristics and public housing intensity (i.e., public housing as a proportion of all local housing). Densely populated communities with low property values and a larger percentage of housing units in poor condition (i.e., fewer units in good condition, with electricity, etc.) were more likely to adopt public housing early on in the program and had relatively large public housing programs by 1970. Communities with a larger share of African Americans and a larger share of Democrats were also more likely to adopt public housing quickly.

In chapter V, I assess the effects of public housing intensity on county-level outcomes in 1970, at the peak of the public housing program. Conditional on state fixed effects and an extensive set of preprogram observable characteristics, I find that communities with high densities of public housing had significantly worse economic outcomes in 1970 in several dimensions: lower median family income, lower median property values, lower population densities, a higher percentage of families with low income, and a higher percentage of female-headed households. The estimated coefficient could be interpreted as a causal effect of public housing if, within-state, there are no omitted variables that are correlated with public housing intensity and that influence the outcome variables of interest. Public housing, of course, was not randomly distributed across counties, and the potential for unobservable shocks and trends *within* states threatens the credibility of the main identification strategy.

With this in mind, I test the sensitivity of the base results from three different perspectives. I first run the regressions again, replacing the state fixed effects with a much larger set of State Economic Area (SEA) fixed effects. SEAs were defined in 1950 as contiguous groups of counties with similar economic characteristics and so counties within a given SEA should experience similar economic trends or shocks. With SEA fixed effects, the magnitudes of the point estimates are somewhat smaller (by approximately one-third), but the results are consistent with public housing having economically and statistically significant negative effects on local outcomes.

To further test the robustness of my results, I use a technique formulated by Joseph G. Altonji, Todd E. Elder, and Christopher R. Taber to assess the likelihood that negative selection on unobservable characteristics is driving my OLS estimates.[5] The Altonji, Elder, and Taber approach centers on a comparison of coefficient estimates from regressions with and without controls for observables. If the variable of interest were essentially randomly distributed (i.e., there is no selection based on

[5] "Selection on Observed and Unobserved Variables."

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observable or unobservable characteristics), then the coefficient estimated with and without control variables for observables would be the same. However, if the point estimate is largely diminished when observable controls are added, then it is possible that the addition of controls for unobservable characteristics would diminish the point estimate even further. My results suggest that, if anything, counties *positively* selected into the public housing program and thus I argue that it is unlikely that omitted variable bias is driving my OLS results.

Third, I adopt an instrumental variable strategy in which I make use of variation in the timing of state enabling legislation. This legislation allowed for the creation and operation of local housing agencies, which could plan and carry out local public housing projects. My IV results are consistent with public housing intensity having adverse effects on economic outcomes in 1970. However, my first stage *F*-statistic of the excluded instrument is low (4.3) so I cannot rule out weak instrument bias.[6] As a final check, I run the IV regressions with a sample that is limited to counties west of the Mississippi River, where there was considerable variation in the timing of enabling legislation. In the reduced sample, the *F*-statistic of the excluded instrument in the first stage is considerably larger than above (7.6) and the results are again consistent with public housing intensity having a negative effect on log median property values and log median income, and a positive effect on the percent of families with low income.

In chapter VI, I assess whether these public housing effects worked through a "human capital channel" and whether similar effects were present in 1950 or 1960. I find that public housing intensity is correlated with lower human capital in 1970 and that controlling for 1970 education does explain part, but not all of the public housing effect. However, I find no correlation between public housing intensity and the in-migration of low human capital residents. Interestingly, I also find no evidence of negative public housing effects in 1950 or 1960, implying that long-run negative effects only became apparent in the 1960s, or that decade-specific factors interacted with public housing in a way that intensified negative local spillovers.

I continue my analysis of public housing effects in chapter VII by assessing the effects of public housing exposure on women's childbearing and household headship decisions. By increasing the availability of low-cost housing and imposing certain incentives regarding income limits, the public housing program might have encouraged young women to have children out of wedlock and head their own households. Controlling for individual- and MSA-level characteristics, I find that local public housing intensity is associated with a slightly higher probability that young black women are single mothers in 1950 and 1970. This relationship becomes stronger when looking only at individuals with less than a high school degree. The link between public housing and female household headship is weaker, but consistent with public housing exposure increasing the probability of household headship for females with less than a high school degree.

[6] Staiger and Stock, "Instrumental Variables."

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Comments on Accominotti, Koudjis, and Zeitz

Thirteen dissertations were submitted in the Gerschenkron Prize competition this year, and they formed quite a diverse collection. The time periods covered ranged from 1200 to 2000, the countries from China through Europe to Africa and South America, the topics from prisoners of war to productivity estimates, from families to finance. There was a prevalence of European institutions (9/13) among universities where theses were completed, with no single country dominating. An educated guess is that only four thesis writers were native speakers of English, which makes their achievements that much more impressive and should remind anglophones of our good fortune in being able to address an international audience in our native

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tongue. General approaches also vary widely. Some notable contrasts were between single- and multiple-authorship, traditional monographs and collections of essays, "presentist" or theoretical vs. historical motivation, and works in progress vs. polished final products. One common feature of these dissertations was their quality. They ask interesting historical questions, they make good use of primary or otherwise novel data sources, they are well-written, and they are careful and painstaking in their research. They reflect extraordinary talent, resourcefulness, creativity, and hard work. Reading the dissertations was fun, abstracting from the time pressure; choosing among them was not.

OLIVIER ACCOMINOTTI

The essays in *Foreign Exchange Reserves, Financial Instability, and Contagion* all relate to international finance and banking in the Great Depression, a topic about which one might fear little more could be said. Yet Olivier Accominotti's dissertation presents us with findings that are both novel and important.

The first essay explores the Bank of France's sales of foreign exchange and accumulation of gold reserves in the early years of the Depression. Accominotti begins by laying out the institutional constraints under which the Bank operated: it was a privately owned, dividend-paying institution that earned interest on foreign exchange holdings; it had relatively little capital; and it was required by a strict gold bullion standard to keep large gold reserves against its note issue. With a loss on foreign exchange holdings capable of wiping out the Bank's capital, it could not but be concerned about possible devaluation of sterling or the dollar. Accominotti's new weekly data on the pound-franc exchange rate show that markets were concerned about the pound already from mid-1929; sterling was consistently below parity and near the lower gold point, without forward rates indicating any expected appreciation. In the summer of 1931, the market's fear of devaluation became acute according to this indicator. Accominotti's data on the Bank's foreign exchange reserves show that it actually suspended sterling sales in this critical period, for fear of bringing about the very devaluation it was worried about. When this nonetheless came to pass, it did in fact wipe out the Bank's capital, forcing it to turn to the Treasury for aid, losing its independence in the process. Market fears next switched to the dollar according to Accominotti's indicators, and the Bank saw itself compelled to reduce dollar holdings.

In chapter two attention turns to the banking crisis of 1931, and the contagion process by which it spread from Central Europe to Britain. The exact nature of British banks' exposure to Central Europe has never been entirely clear (to this reviewer anyway) before now. Accominotti shows that it was the merchant banks rather than the clearing banks that found themselves in difficulty. Assembling data from a variety of sources on most of the important merchant banks—no simple matter since they were not required to publish balance sheets—he documents their involvement in financing European trade through banker's acceptances. At a number of banks, Central European acceptances exceeded capital and reserves, leaving them especially vulnerable to a shock like the German standstill agreement in the summer of 1931. Unexpectedly forced to pay out on the insurance they had effectively written on trade credit, merchant banks found themselves simultaneously under pressure from worried depositors (a pressure not experienced by the clearing banks). The result was a credit crunch as interbank lending dried up and the merchant banks contracted their balance sheets—especially acceptance credit, of course. The channel by which merchant bank distress led to a run on the pound was indirect, operating via the Bank

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of England's provision of support in the form of some £30 million in securities purchases from the banks—a roughly 10 percent increase in the Bank's portfolio.

The final essay adopts a more global perspective. Accominotti assembles a data set of monthly indicators of exchange market pressure (the sum of depreciation and loss of reserves), sovereign bond spreads, and stock market returns for more than twenty countries. He then uses principal component analysis to identify the common, global element in these national series, with two interesting results. First, 1931 is the year in which there is clearly *global* financial turmoil, rather than just a number of national crises. (This is the year in which the first principal component for all three indicators moves the most, and the year most responsible for its correlations with national series over the entire sample period.) Secondly, there is a clear differentiation between international lenders and borrowers. A subset of international creditors imperfectly corresponding to the future gold bloc—Belgium, France, the Netherlands, and Switzerland—all experienced *reduced* exchange market pressure just as other countries experienced an increase. (Their "factor loadings" were negative rather than positive as for other countries.) Excepting Belgium, the same is true of sovereign bond spreads. Stock market returns are instead less well-correlated across the globe, and are not differentiated by countries' current account status. Accominotti attributes these findings to a liquidity crisis in 1931 that led to a sharp fall in international lending, putting immediate pressure on the exchange rates of borrowers, and indirectly impacting bond spreads since most foreign debts were denominated in dollars.

Impressive in all three essays are clear writing and analysis; judicious use of narrative, econometrics, and elegant figures; enterprise and ingenuity in finding data even when there were reasons to think it might not be possible to find; and above all clear, intuitive, and convincing results about important historical questions.

PETER KOUDJIS

Testing models of asset price formation occupies Peter Koudjis in *Trading and Financial Market Efficiency in Eighteenth-Century Holland*. Studying the trade in English securities on the Amsterdam exchange allows him to overcome some of the difficulties presented by modern markets, which are both too rich in information about relevant news arriving (virtually every minute) and too poor in information about the trades of individuals (kept private). In the Dutch market in the 1700s, by contrast, information relevant to British assets arrived infrequently, from London, at well-identified moments. And from the archives data on the trading positions of numerous market participants can be gathered.

Koudjis first asks what share of asset price movements can be attributed to the arrival of relevant new information. His data on the variance of prices in periods with and without news provide a clear answer: between a quarter and a half. This figure is much greater than what studies of contemporary markets suggest, an unambiguous result that follows from his clean identification of the arrival of news in the form of the mail packet boat from London.

Chapter two investigates the roles of asymmetric information and of small, risk-averse traders. Koudjis explains the otherwise puzzling contemporaneous correlation of British asset prices in London and Amsterdam as reflecting the diffusion of private information: inside information was sent by mail to Amsterdam, where it arrived and began to affect the market just as it was becoming public information and moving the market in London. Ordinary, uninformed market participants avoid trading in periods when they know insiders are on the move, as price uncertainty is

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greater at these times. They instead dominate trade in no-news periods, which again can be identified due to the unique nature of this historical market. And the data show that price dynamics were different, depending on who was active in the market. Price reversals, a phenomenon seemingly at odds with the efficient market hypothesis, were much stronger in no-news periods. In a formal model, Koudjis demonstrates how this can be explained by trading driven by random liquidity shocks in the absence of news. When market participants are small and risk averse, they demand compensation for altering their portfolio in the direction of greater holdings of a risky asset, which means the asset's price must first fall and then rise back to its original level. The opposite movement obtains when accommodating a shock requires them to lower their holdings of the risky asset. None of this requires any failure of rationality or herd-like behavior.

The final chapter is an exploration of the market's reaction to "fire sales" of assets by distressed traders. From archival records, Koudjis and co-author Hans-Joachim Voth are able to identify cases in which the bankruptcy of speculators left their agents with large positions to unwind, and to follow their subsequent transactions. Exploiting information on prices of the same assets in London, they find that the Amsterdam market overreacted, with prices changing sharply before gradually returning towards pre-turmoil levels. Importantly, they are able to show that this movement was *not* driven by actual transactions by the distressed traders, who managed to avoid recourse to fire sales. Thus, it was not a question of compensating liquidity providers for the greater risk in their portfolios, the mechanism elucidated in chapter two. Instead, it reflects the market's uncertainty about the timing and size of the position to be unwound, hence difficulty in predicting future price movements. Again, this apparently inefficient behavior of the market does not require any irrationality or bubble-like dynamics.

The entire dissertation is beautifully crafted. Koudjis's understanding of the historical context is deep; it goes beyond knowledge of the market's rules, participants, and assets traded, extending even to matters such as the predictability of weather and North Sea crossing times. The attention to detail and anticipation of the reader's questions and objections are similarly impressive. This was the only dissertation to make substantive use of formal models, and if the main results can be understood without the models, that is only because of the author's clear writing even about difficult technical matters.

PETER ZEITZ

In his *Essays on Industrial Productivity in Twentieth-Century China*, Peter Zeitz identifies three questions that are not only topical—who is not interested in Chinese economic development?—but also of relevance to a wider range of questions. And he obtains three results that are clear, believable, and important.

The first essay investigates the extent to which optimal technique is context-specific, and relates to debates about appropriate technology, technology transfer, and the determinants of comparative productivity. In China's cotton textile industry in the 1920s and 1930s, British-, Japanese-, and Chinese-owned firms operated side by side, making possible a comparison of varying techniques and results in a constant environment. While the productive technology employed by all firms was common, the organizational techniques that Japanese and British firms brought with them from their home markets differed radically. The centralized, hierarchical system of the Japanese resulted in high labor productivity according to Zeitz's estimates, while the

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relatively hands-off subcontracting of the British was something of a disaster. For the recruitment and direction of workers, British firms depended on local forepersons who had an interest in maximizing employment, with predictable results for productivity. And once entrenched, forepersons were successful in resisting all attempts at reform. This analysis gives some real content to notions such as technological congruence and social capability.

The next essay studies the effects of incentive schemes in a centrally planned economy, asking whether performance related bonuses introduced in 1978 really enhanced productivity. Zeitz's econometric work, which is more careful than previous studies in dealing with problems of endogeneity and controlling for other determinants of productivity change after 1978, shows that in the iron and steel industry short-run increases in output came at the expense of *lower* productivity in long run, attributable to the neglect of non-incentivized tasks such as maintenance and investment. As well as casting light on the early phases of economic reform in China, this provides a nice illustration of the need to expect the unexpected in incentive design.

Chapter three relates to debates on the relative price of capital, embodied technical change, and import-substituting industrialization. Zeitz relates the intriguing story of China's dependence on entire steel mills imported lock, stock, and barrel from the Soviet Union during the 1950s. When a political break between the two nations abruptly ended this flow in 1960, Chinese-built equipment proved a very poor substitute. Using two different data sets, Zeitz first shows that imported capital contributed disproportionately to productivity growth at the industry level in the 1950s, then how in a later period new investment tended to *lower* the productivity of iron and steel plants with older (imported) capital, while having no effect on those with newer (Chinese) equipment. The result of the rupture with the Soviet Union was therefore a massive slowdown in productivity growth.

Throughout the dissertation, Zeitz impresses with his careful attention to econometric issues, his knowledge of the secondary literature, and his identification and use of Chinese-language data sources both published and unpublished.

BRIAN A'HEARN, *University of Oxford*

Comments on Kollmann, Puerta, and Shester

It is a pleasure to comment on the finalists for the 2011 Nevins Prize in American Economic History. Let me begin by thanking all the graduate students who submitted their dissertations. We celebrate the accomplishments of those students who have completed their graduate training, showcased their work, and lit a path for others to follow in their exemplary manner. The range of topics and breadth of knowledge displayed in the submitted dissertations was impressive and would make Allan Nevins, a prolific author of American history, proud. The task charged to me was to narrow it down to the three works I will discuss today. Of course, this was not an easy task as there were many worthy submissions, several of which I do not have the opportunity to discuss today, but which I am sure will make important contributions to the field of economic history.

The dissertations of the chosen finalists share many virtues. They ask important questions that are theoretically grounded and employ data in clever ways to try to answer their questions. Thematically, they are also bound together. Although the

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precise settings and questions vary, all three are microeconomic histories that assess the effectiveness of programs or policies and attempt to tease out the "causal" effects of government policies or programs. And in the wake of the recent housing price bubble in the United States, it seems somewhat appropriate that two of the papers deal with government responses to housing problems of the past.

TREVOR KOLMANN

Trevor Kollmann's dissertation focuses on government responses to the housing crisis of the 1930s. Following the thematic footsteps of recent Nevins prize winner, Leah Platt Boustan, Kollmann explores the interaction between race and housing markets, delving into how migration of African Americans affected housing values in the 1930s, how various federal housing programs influenced rents and values of structures, and how public housing projects influenced rents in the 1930s and 1940s.

In the first part of his dissertation, the key question of interest is whether there is a causal link between race and property values. As early as Hoyt's (1939) study of housing markets, analysts claimed that local housing values in the United States were sensitive to the racial composition of residents. Kollmann studies a period when African Americans were migrating in large numbers from the rural South (although the numbers were likely slowed due to the Great Depression), and when many of them faced restrictions on where they could live as a result of racial ordinances, restrictive covenants, and outright discrimination.

The question Kollmann addresses is important for public policy. It is the period when the term "redlining" was first used and when discriminatory lending practices may have thus altered the racial composition of neighborhoods. His research therefore helps us understand the broader question of how restricted market choices for certain ethnic groups affect housing values. It is well-known, for example, that black households on average lived in neighborhoods with lower housing values in the 1930s, but the characteristics of neighborhoods differed, with predominantly black neighborhoods being older and having higher densities of settlement. Hence, more careful analysis using micro-level data, the kind of analysis displayed in Kollmann's dissertation, is needed to understand the dynamics of the housing market.

New York City is the focus of his study and an interesting one in the sense that it was both a major recipient of black migrants and an early adopter of public housing. Of course, focusing on New York City has some drawbacks, including the issue of external validity and how well the results generalize to broader geographical areas (given the observed heterogeneity across cities). That said, Kollmann nicely describes the evolution of segregated housing in New York City, and addresses the influence of transportation improvements (subway) and race relations in the locational choice of its occupants.

In the first part of the dissertation, Kollmann gathers data on 390 neighborhoods across the five boroughs of NYC. The underlying HOLC survey provides ranges of housing values (sales and rents) for these neighborhoods, information on the type of housing stock, age of stock, and types of units. The data set is refined enough (for a single city) so that careful treatment can be given to analyze housing values; the data also allow him to test for effects sorting residents by race and recent migration patterns. He then supplements these data with a 5 percent sample of the New York City population, and develops a hedonic model of housing prices, where values depend on a variety of characteristics aggregated to the neighborhood level.

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To sort out how race affects housing prices, it is necessary to model both the existing ethnic composition of a neighborhood as well as the flow (due to migration). Neighborhood choice for new migrants, however, is likely endogenous, depending on localized negative demand shocks that are independent of migration. Kollmann therefore uses an IV approach with spatial controls. The findings are interesting and suggest that African Americans tended to prefer to migrate to neighborhoods where large concentrations of their own ethnicity already resided. When they chose predominantly white neighborhoods, they paid a premium to do so, suggesting that, *ceteris paribus*, in-migration did not reduce housing values. However, that finding is tempered by the fact that the premium erodes as the share of blacks reaches around 30 percent. It would be nice to know something about the speed at which prices changed as the migration occurred, although the limitations of the cross-sectional data used in the analysis do not permit us to observe this at present.

One issue Kollmann has to contend with is that his analysis focuses on the Great Depression, a period when the economy was far from full employment or long-run equilibrium. For example, at points in the 1930s, unemployment was in excess of 20 percent. Housing price dynamics and migratory patterns may thus reflect these conditions. For example, blacks may not be moving to NYC due to better local economic conditions or more pronounced housing price changes in particular neighborhoods or cities. It would be great if these issues could be discussed further to give us a sense of how generalizable the results are.

Indeed, it is policymaking during the Great Depression itself which serves as backdrop to the next part of the dissertation. In response to the collapse of the economy in the 1930s, the federal government became more active in housing markets, creating a variety of programs to promote home ownership and protect current home owners suffering economic hardship. Even with the advent of these programs, rates of ownership fell from 47 percent to 44 percent over the 1930s. By way of introduction to this topic, the dissertation left me wanting to learn more about how much the issue of race factored into the creation of federal programs, especially given that home ownership by race is of chief interest.

The empirical approach exploits intrastate variation in government spending, and he estimates effects of these programs at the SEA level, in other words how the average SEA-level spending of a particular program influences home ownership rates. Ideally, we would want to measure each household's receipt of government funds to measure the effects these programs had on home ownership, but neither the same individuals are observed over time in the census sample nor are government expenditures to individuals. This means, that when interpreting any measured effects of these programs on home ownership, we are incorporating both direct effects on black and white households as well as potential spillovers from other households located within the same SEA.

Interestingly, of the programs considered, only the FHA (by insuring new dwellings and renovations and expanding the pool of mortgages through standardization) seems to have had a positive and statistically significant effect on home ownership. Kollmann's work also contributes to an emerging literature on the Home Owners Loan Corporation (which refinanced mortgages for households in distress and replaced troubled bank assets with government bonds); however, in contrast to other recent studies, he finds this program had a small negative, but statistically insignificant effect on home ownership.

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The final part of Kollmann's dissertation examines public housing projects in New York City. As noted in my comments on Katharine Shester's dissertation, policymakers in the 1930s were increasingly worried about slums and the availability of housing for the poor. Kollmann nicely reviews the records of the PWA, U.S. Housing Administration, and the New York City Housing Authority to understand the motives behind the construction of early public housing and discern the purpose of its construction. For example, the NYCHA seemed particularly committed to the goal of slum clearance. Some commentators worried that publicly funded housing would crowd out private investment, while advocates of these programs countered that public housing project filled a void in the housing market where private investors failed to deliver an adequate supply of low-cost housing. They also envisioned a richer set of positive outcomes associated with its construction, including improved sanitation, lower crime rates, and higher educational attainment.

Using census tract data, he constructs probit models to determine the factors that correlate with the location of public housing at the neighborhood level. Kollmann examines data only on New York City in order to understand the localized effects. Focusing on a single city has the distinct advantage of allowing him to better control for particular neighborhood variables. On the other hand, New York City built only ten housing projects between 1930 and 1940, so even though the neighborhood data are rich, we are basing any conclusions we draw from the estimation on a small sample of constructed public housing projects, the location of which (as Kollmann explains) was restricted according to the stated criteria of the New York City Housing Authority. Nevertheless, he finds that early public housing in NYC was constructed in crowded neighborhoods whose residents relied on public transportation. He finds some evidence that housing in predominantly black neighborhoods was delayed at least a decade, until the 1940s.

He then uses a hedonic modeling approach, accounting for local heterogeneity, to test whether public housing influenced property values. In particular, he measures whether the effects are sensitive to distance from public housing. In contrast to some other studies focusing on later periods of public housing, he finds that the earliest public housing projects of the 1930s increased contract rents, and that the effects are strongest near the sites of the public housing projects.

While one cannot force a marriage of the dissertations of Shester and Kollmann, we begin to see a clearer picture of public housing's effects. As more projects were built across the country, perhaps it was the case that the quality of the public housing declined, that decisions about where to build and how to build changed, and that, as a result, crime, health, education, and income in local communities suffered. This story emerges out of careful quantitative research that both of these economic historians have undertaken, and suggests that the prospects for future research or even collaboration between these two scholars will help fill in the gaps in understanding this important part of twentieth-century social experiment.

JUAN MANUEL PUERTA

One issue that economists have identified as central to underpinning modern economic growth is investment in human capital. For example, recent growth theory has focused on explaining the transition from a "Malthusian equilibrium" to one of sustained economic growth. Such theories emphasize how a virtuous circle of education and income can emerge, thus propelling growth. Unified growth theory,

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for example, suggests that a Beckerian quantity-quality tradeoff will unleash a "demographic transition," eventually moving the economy to a state where substitution effects (i.e., greater investment in children) dominate income effects (i.e., having more children).

These models of economic growth predict that economic factors matter for the timing of the demographic transition, a testable hypothesis. In a very broad sense, this is where Juan Manuel Puerta's dissertation fits into the literature. He focuses on analyzing policies that affected the trade-offs between the quantity and quality of children between 1850 and 1920 in the United States—a period that corresponds to an accelerated growth in income per capita. The era Puerta's dissertation analyzes relates more to the timing of particular policies that may affect this quantity-quality tradeoff, than to the period when the U.S. economy first experienced sustained positive growth rates, a notably earlier occurrence. Nonetheless, salient changes were taking place in the American economy at this time. At mid-nineteenth-century, the average American woman gave birth to roughly six children, but by 1920 this had fallen to around three children. Mass schooling also emerged during this period and child labor fell dramatically.

Puerta's dissertation first examines how compulsory schooling laws, implemented at the state level, affected educational outcomes. The laws came into place beginning in 1852, with the last state enacting them around 1920. Just how much they contributed to the big rise in enrollments is the question Puerta examines. Previous researchers have generally found that these laws had little effect on improving enrollments or long-run educational attainment; however, Puerta finds the opposite. A careful difference-in-differences research design enables him to show that previous results were driven by unaccounted for economic, social, or demographic characteristics varying at the state level.

Following the identification strategy of Card and Krueger and others, he aims to create treatment and control groups that are similar in every way except one —the policy variable of interest—and attempts to do so by restricting the sample to populations in those counties located along state borders. Borders then mark the discontinuities in policy. He uses U.S. Census household data to implement his difference-in-differences estimator. It should be noted that census workers at the time recorded whether the child had attended school in the previous year, and this is what is taken as a proxy for enrollment in his analysis. One might question whether attending school is the same as being enrolled for a whole year or even the majority of the year. If attendance differed from enrollment spatially, then this definitional difference could introduce a bias into estimation. And, reflecting on the broader question here, one might wonder how well "attendance" rather than other schooling variables measures human capital.

This chapter also explores the effects on long-run educational attainment by mapping the increased enrollments associated with CSLs onto later-life educational outcomes. Here, the identification strategy nicely exploits the attainment of cohorts above and below the age of treatment; Puerta finds that adoption of CSLs boosted educational attainment by a little less than a third of a year.

In the second chapter of his dissertation, Puerta and his dissertation advisor, Hans-Joachim Voth, examine the effects of CSLs on fertility. The paper follows the theoretical insights established by Becker in that it views the CSLs as increasing the relative cost of children, and hence potentially resulting in fewer being born. There are two nice methodological innovations in this chapter. First, in order to overcome deficiencies in the existing historical data, the authors construct fertility based on the

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number of children living with the mother at the time of the census—a measure that is similar to what is used by the UN in developing countries. In particular, they define a flow fertility measure that compares fertility one, three, and five years before and after CSLs were passed based. Of course, it is quite plausible that if mothers at this time were foreign born or recently moved, their young children may be in other residences until the mother has settled and established stable housing arrangements. This could lead to undercounting of the true number of children initially. Later, after reuniting, the woman could report more children. The authors' fertility measure would view this as an increase in fertility when, in fact, fertility has not changed. Another channel that could be affecting fertility decisions that is not discussed in the paper is religion. For example, there is considerable evidence that Catholics have higher fertility rates than Protestants. This could affect both native-born and foreign-born estimated effects, so further consideration of this household characteristic would be useful.

Puerta and Voth's preliminary regressions show that, along borders of states, women reduced their fertility by roughly 15 percent as a result of the passage of CSLs, with the effects being strongest for women who were young at the time the policy changed; however, it is possible that fertility decisions and approval of legislation requiring compulsory schooling are related. If, for example, voters happen to prefer lower fertility and CSLs due to socioeconomic characteristics, then the results would be biased upward. To deal with this concern, Puerta and Voth cleverly take advantage of a Supreme Court decision that changed the border between Rhode Island and Massachusetts in Fall River, Massachusetts. They use this exogenous event to identify (causally) the effect of fertility and control for possible endogeneity. They find evidence that lower fertility in the town occurred in areas that had been part of Massachusetts longer, and the timing in the decline matches when a CSL was in place in Massachusetts, but not in Rhode Island.

The final substantive chapter of the dissertation examines how child labor laws enacted after 1900 affected U.S. manufacturing. In 1900 more than 20 percent of children between the ages of 10 and 15 worked in some form, roughly 6 percent of the labor force, but during the Progressive Era, the number of children working fell dramatically to around 5 percent by 1930. Most previous research on child labor in the United States has focused on household outcomes, such as enrollment or employment. Puerta's work instead focuses on how these laws altered firm behavior.

Puerta focuses on a single outcome variable, value added (rather than, for example, the cost structure of the firm), and collects these data from the U.S. Censuses of Manufactures over the period 1900–1920 to examine the impact of the passage of child labor laws on various industries' growth rates. He finds evidence that the laws reduced growth rates most in industries that depended on child labor. In particular, he focuses on the glassblowing industry located in the Ohio Valley. This industry spanned several states, some of which had passed CLLs. In this industry, growth rates in value added are estimated to be around 2.5 percent per year lower as a result of the CLLs.

Value added and a variety of covariates are collected for 154 industries and 48 states and for three censuses so that variation across industries, states, and time can be exploited. Indeed, it is the within variation that we are truly interested in, and while state and industry fixed effects are accounted for, it was not altogether clear why the sample period that was tested was limited to 1910-20. One could have actually included another time period 1930, and then run a fully interacted model. Using the Census of Manufactures data for this exercise is also tricky. For example, in states where one firm is dominant, the census simply does not report output for that industry

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(due to confidentiality reasons). This means that, in some states, we are missing the most important firms and industries. Similarly, the panel is not balanced: not all industries are in all states.

The key assumptions for identification are that the amount of child labor used in a particular industry is based on the underlying technology of the industry and that the laws are not determined by the industries located in a particular state. Regarding the first assumption, the author is employing the empirical set up of Rajan and Zingales (1998), which exploits the variation across industries and countries to identify the extent to which financial development influences industry growth rates. Here, the same assumption was made. In Puerta's analysis, it has to be assumed that technologies are the same across states (reasonable) and time (perhaps less reasonable). Moreover, the use of this approach in R-Z was grounded in corporate finance literature. I found myself wanting a better theoretical justification for the reduced-form regressions run here. Regarding the second assumption, Puerta notes that the passage of CLLs between was driven by the National Child Labor Committee, suggesting that the laws were exogenous to state-specific circumstances. My concern with this assumption is that it is likely the case that particular industries, which used child labor extensively, may have lobbied to delay implementation—hence the timing of passage would not be independent to state-specific factors (here, the size of industry lobbies).

In terms of interpreting the results, one also wonders the extent to which the labor markets across states can really be treated in isolation. Since workers were free to move between states, some additional robustness checks along these lines would be enlightening. Finally, relating this point to the issue of firm costs, we see slower growth rates in industry-state cells where child labor laws were passed, but we cannot really relate this back down to the cost structure of the firm. This has to be assumed, which leaves one wondering a little about exactly what we have measured. That is, the R-Z methodology is useful when the outcome variable we care about is the growth of firms, but it tells us less about how firms alter production when relative prices of inputs change—as would be the case with the passage of CLLs. Although very preliminary in nature, this chapter nevertheless points to some fascinating new implications for how we think about the effects of child labor laws.

KATHARINE SHESTER

While state-level policies of the late nineteenth and early twentieth century shaped labor market outcomes, an increasingly active federal government in the second quarter of the twentieth century began to offer direct assistance to households, notably in the promotion of greater home ownership and provision of housing assistance to the poor. The federal government's role increased markedly in the 1930s, a period that defines the starting date for consideration of the other two finalists for the Nevins Prize.

Katharine Shester's dissertation provides a comprehensive examination of federally supported public housing, examining its origins in the 1930s, its diffusion, and its demise in the 1970s when the government replaced it with a system of rent vouchers. Over this period, the federal government provided assistance to move poor households from substandard housing to something that was hoped to improve their living situations. The programs had multiple aims, among which was slum removal. Implicit in the government's approach to this problem was the notion that private markets were incapable of providing housing of sufficient quality to the poor. Moreover, if

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some of the housing that poor lived in contributed to high rates of crime, disease, and fire, the government might ameliorate these negative externalities and improve local neighborhoods by direct intervention in the housing market.

Shester traces the legislative developments beginning in the 1930s, showing how perceptions of the purpose of public housing were over the subsequent decades were continuously reshaped: early on, more employment and more structures for the poor; and later stating in the 1960s, as a reaction against what had already been built. Importantly, Shester highlights that legislation seems to have shifted from providing assistance from working-class families to single mothers dependent on welfare.

Shester's dissertation combines the best of original data collection, careful historical research, and state-of-the art quantitative techniques. Using microfiche from HUD, she puts together what is probably the first comprehensive data set of public housing (years of construction, number of units, funding program, etc.) covering the United States so that she can examine its diffusion between 1940 and 1970. In doing so, she is able to both describe where public housing was built and what factors determined its spread. In particular, she finds that the South and Northeast were early adopters of housing, having greater concentrations of housing (or intensities of participation). Notably, the greater concentration in these regions persists through the 1970s.

She first uses her data set to explore what factors were important in determining when a community first put into place public housing and finds that build out of public housing was positively associated with large urban populations, poor initial housing conditions, and lower stocks of owner-occupied housing. In other words, places that "needed" public housing adopted it more quickly. To enrich these initial findings, which seem altogether sensible, it would be nice to describe to the reader a little more about the decision making behind the choice of housing location. While results from the 1940 presidential election are used to test for the effects of politics, the results still beg further analysis: if the decision to build is endogenous to politics, what were the politics of this choice? How much weight did local actors carry relative to federal officials? Perhaps even a political economy model of the housing location would be a useful extension.

She then turns to examining how public housing affected counties in which there were large concentrations of public housing, examining various measures including property values and family incomes. Here, the focus is on how public housing may have causally affected these outcome variables. Housing values could initially rise as slums are cleared. On the other hand, as the supply of housing increases, it could alternatively cause prices to fall. Employment and wage rates could also rise if public housing increased local labor demand and this effect dominated in-migration. In the long run, generous public housing provision could attract low human capital workers. Such projects might require public funds for maintenance, and if new infusions were not provided, a decline in quality could lead to the very disamenities that such programs sought to eliminate.

Although it is difficult to pin down the causality, Shester reveals some interesting patterns in the data, finding that public housing intensity in 1970 is associated with lower median property values, median family incomes, and higher population densities and female-headed households. I appreciated the careful attention Shester pays to omitted variables and causal effects. She uses recent econometric techniques to test how much unobserved variables may be driving the results and constructs an instrumental variable based on the timing of state enabling legislation to address these concerns. Even so, I worry that her instrument has too little variation to be powerful (indeed, the F-statistic is less than five), and some of the effects (property values)

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seem to lose their statistical significance, even when the sample is limited to where there is more variation in the enabling legislation.

Shester also examines whether these outcomes are present in earlier decades, and finds little statistical evidence that the various outcome measures and public housing are statistically related prior to 1960. This is a tantalizing result, suggesting that the public housing stock had to expand sufficiently to generate disamenities or county characteristics changed over time (including, potentially, the quality of the public housing). For example, changes to communities in the 1960s (riots, drugs, family structure, etc.) when interacted with public housing might be driving these findings. I hope Shester's future research will try to tease out these relationships in more detail.

Armed with these results, Shester next assesses why communities might see these effects. Is it in-migration of lower-skilled workers attracted by cheaper housing or out migration of higher-skilled workers due to the presence of public housing? Using data from the 1970 IPUMS, Shester can observe education levels and whether people lived in the same city five years earlier. She aggregates these data to the county level and then examines whether there is a positive relationship between public housing intensity and the percent of the population composed of migrants without a high school degree. Of course, if we had an ideal data set, we would want to keep the richness of the individual-level data and use this to track the same individuals over time. She finds little evidence that it was in migration of low-skilled workers, but rather some evidence that outflows of skilled workers are driving these findings. This part of the dissertation is likely most ripe for future development as the results presented were more suggestive rather than conclusive.

In the last chapter of her dissertation, Shester estimates the marginal effects of public housing exposure on females' decisions to become single mothers and household heads. She finds that exposure to public housing leads to a slight increase in the likelihood of being a single mother. This might be important if single-parent homes have childhood outcomes with lower educational attainment, emotional problems, and behavioral problems. Using probit analysis, Shester estimates that public housing was not a major cause of the sharp rise in single mothers and female head of households in the 1960s and 1970s, only contributing to around 4 percent to the former and 2 percent to the latter.

In conclusion, while it is difficult to decipher the exact channels through which public housing affected communities, Shester's dissertation provides new quantitative estimates of its impact on aggregate household incomes and property values, and offers suggestive evidence that human capital formation is one likely factor through which these outcomes were affected.

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