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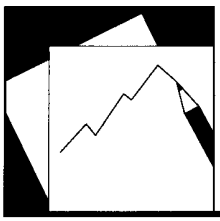

IMF Working Paper

Market Phoenixes and Banking Ducks

Are Recoveries Faster in Market-Based Financial Systems?

Julien Allard and Rodolphe Blavy

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Market Phoenixes and Banking Ducks
Are Recoveries Faster in Market-Based Economies?

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Abstract

Recoveries vary considerably across countries: our paper compares recoveries in bank-based and market-based economies and finds that market-based economies experience significantly and durably stronger rebounds than the bank-based ones (in particular the more bank-based economies of continental Europe). Further, stronger recoveries also tend to be associated with broader economic flexibility. Our findings suggest that dealing with bank sector vulnerabilities is paramount to support the recovery. In the medium term, structural policies to deepen financial markets are useful, but need to be complemented with structural measures to address rigidities more broadly in the real economy.

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I. INTRODUCTION

Over the last fifty years, the speed of economic recoveries has varied considerably across countries. For example, real output growth one year after a crisis averaged 4.4 percent in the United States, 2.2 percent in Japan and 3.4 percent in Germany. What drives economic recoveries has generated much research interest, especially in the current context of diverging recoveries globally. Our paper contributes to this debate by looking at the specific importance of financial factors.

Previous studies have found that growth is slower following financial and banking crises, synchronized crises, and deep recessions. Evidence is mixed as to whether the openness of an economy—as measured by trade openness, capital account liberalization, and exchange rate liberalization—matters. Countercyclical monetary and fiscal policies can mitigate the effects of crises and tend to induce stronger recoveries. There is a large literature on the impact of the financial structure on long-term economic growth, but its impact on the business cycle and on economic recoveries remains little explored.

We look at the hypothesis that the financial structure of an economy—i.e., whether an economy is bank-based or market-based—matters for its ability to recover from economic crises. We study a sample of 84 economic crises in 17 advanced economies from a database established by the IMF (2009) for a period covering 1960 to 2007. After clustering countries as either bank-based or market-based, we test whether recoveries are significantly different between the two groups of countries.

The main findings of the paper are as follows:

- Within our sample of advanced economies, market-based economies recover faster than the bank-based ones. After controlling for a set of variables, the gap is estimated between 0.8 and 1.4 percentage points two years into the recovery.

- This comparative advantage is amplified when comparing strongly market-based to strongly bank-based economies—with the former experiencing a positive cumulative growth gap of up to 2.7 percent, compared to the latter, two years after a trough.

- The growth differential even increases over time, and is greater 8 quarters into a recovery than after 4 quarters.

- However, beyond this immediate result, stronger recoveries in market-based economies are found to be associated to other economic features, in particular the flexibility of the real economy. When employment and product market flexibility are taken into account, the comparative advantage of market-based economies in recoveries becomes less significant.

- Finally, the nature of preceding crises also matters—in particular, financial crises negatively impact the ability of market-based economies to recover compared to bank-based economies, possibly due to their greater dependence on the financial sector.

The implications of these findings for the current recovery are sobering. First, growth differentials among advanced economies in the recovery phase are grounded in substantial differences in the financial structure of their economies—strong growth in Canada, Australia, and, to a lesser extent, the United States,[2] the top three market-based economies, may be compared to more sluggish recoveries in Spain, Portugal, and Belgium, the top three bank-based economies of our sample. Second, with a highly synchronizing crisis associated with a deep financial crisis, recoveries, even in market-based economies, are expected to be sluggish. As most continental European economies have bank-based financial systems, a protracted recovery is a greater source of concern in this region.

Our results may have important policy implications:

- In the short term, because the financial structure of economies matters, policies to reduce hurdles to recoveries in bank-based economies—such as dealing with weak bank balance sheets through recapitalization, restructuring, and resolving impaired assets—would play an important role in supporting the recovery. This is particularly relevant for continental European countries.

- In the medium term, because the financial structure of economies matters, structural policies to deepen financial markets so that they can effectively complement banking sectors are useful. This suggests that policies that would stifle the development of financial markets after the crisis would be misguided.

- However, because financial crises are more costly in terms of slow recoveries, the development of financial markets must be accompanied by measures to enhance the stability of financial markets.

- Finally, policies must go beyond financial markets and address rigidities more broadly in the real economy—to facilitate the ability of economies to recover from crises.

The paper is organized as follows. Section II reviews the literature of economic recoveries. The main motivation of our paper comes from noting that the impact of financial structures on the nature of economic recoveries has been relatively unexplored therein. Section III presents the key stylized facts across recoveries in bank-based compared to market-based economies during the past 50 years. Section IV provides the methodology and empirical results. The last section concludes and discusses policy implications.

[2] The current recovery in the United States may need to be interpreted with caution. While the US economy has done relatively well in the past decade and financial markets can be a powerful facilitator of growth, some specific factors, such as high unemployment rates and unresolved structural issues (e.g., the large number of housing inventory and share of underwater households), as well as concerns over fiscal prospects, could prove a strong drag on growth.

II. Crises and Recoveries: A Brief Literature Review

The economic literature on the determinants of economic recoveries has identified key factors that explain differences in recovery patterns.

- The nature of the initial shock or crisis is important for the future recovery. In particular, financial crises are found to be associated with slower and more protracted recoveries than other shocks—as clearly identified by Reinhart and Rogoff (2008, 2010). The April 2009 IMF World Economic Outlook (WEO) shows that real growth one year from trough after a financial crisis is approximately 2½ percentage points lower than after other types of crises.[3] The time needed for the economy to recover to its previous peak is also considerably longer in the case of financial crises.[4]

- The amplitude of the recession matters for the recovery, in what is called a "bounce-back effect:" deeper recessions induce faster recoveries. Based on Friedman (1993)'s plucking business cycle model, cyclical contractions tend to dissipate more quickly the larger the size of the contraction. Sichel (1994) and Wyme and Balke (1992) find supporting empirical evidence.

- When crises are synchronized internationally, recoveries tend to take longer. The IMF (2009) estimates that it takes approximately 50 percent more time for an economy to recover when recessions are synchronized than when they are not.[5]

- Evidence is more mixed on whether global economic integration—i.e., trade openness, capital account liberalization, exchange rate liberalization—affects the speed of recoveries.[6]

- Countercyclical monetary and fiscal policies can mitigate crises and lead to faster recoveries (for example, Cerra et al., 2009). The estimated effect of countercyclical fiscal policy is large. A one-standard deviation increase in government spending during a recession results in a 0.7 percentage point increase in growth rate one year after trough—

[3] The April 2009 WEO analytical chapter on "From Recession to Recovery: How Soon and How Strong?" looks at six different types of shocks—fiscal policy contraction, monetary policy tightening, oil shocks, external demand shocks and financial crises, and other shocks. Out of 122 recessions in their sample, 15 are associated with financial crises.

[4] With broader samples including emerging markets, Cardarelli et al. (2009) and Cerra and Saxena (2008) confirm that financial shocks lead to sluggish recoveries.

[5] A recession is "synchronized" if at least 10 out of the 21 countries are in recession at a certain point in time. In addition to the current cycle, three other episodes of highly synchronized recessions are identified: 1975, 1980 and 1992.

[6] Studies, mostly focused on emerging economies, find contrasting results. For instance, Cerra et al. (2009) show that floating exchange rate regimes lift growth in recovery but exhibit weaker performance than a fixed regime in other expansion years. They also find that more trade openness tends to be associated with slower recoveries, notably because openness limits the effectiveness of fiscal policy.

though this depends on the initial level of public debt.[7] The effect of monetary policy is more limited, with a one-standard deviation reduction of interest rates, beyond that implied by a Taylor rule, resulting in a 0.4 percentage point gain.

The disproportionate impact of financial crises on growth bears some investigation. What are the channels through which these shocks affect economies? This question is relevant today, given the commonality observed through past episodes of crises and identified by Reinhart and Rogoff (2008, 2010). Kannan (2010) associates the sluggishness of recoveries after financial crises to the lack of bank credit post crisis to support economic growth. Using industry-specific data, he shows that industries dependent on external financing experience slower recoveries than other sectors. This is consistent with Abiad et al. (2010)'s finding that growth during creditless recoveries is about one third lower than during other recoveries. They find that investment—which is likely to depend more on credit than consumption—has a disproportionately smaller contribution to growth in creditless recoveries relative to other recoveries, although consumption takes a hit as well. Further, while creditless recoveries are more common in developing countries and emerging countries, they also occur in advanced economies.

Building on these results, this paper looks at whether bank-based economies recover differently from market-based ones. The distinction between bank-based and market-based economies is well recognized in the economic literature. Yet, empirical studies have focused mostly on how different systems affect long-term economic growth. Recent studies (La Porta et al., 1997, Levine, 2000, and Beck and Levine, 2001) argue that the distinction between bank-based and market-based economies is of second-order importance to explain real economic growth, and find that what matters for growth is the depth of the financial system and the extent of services it offers. These findings do not preclude exploring whether differences in financial systems matter in the short term, over business cycles, and, more specifically, during recoveries.

To the best of our knowledge, only Mavrotas and Vinogradov (2007) consider the effect of the financial structure on the speed of recoveries. They show that market-based economies recover faster from financial crises. Under an overlapping generations model, they nevertheless find that bank-based systems can smooth financial shocks across generations, with desirable effects from a poverty reduction point of view. Mavrotas and Vinogradov's approach is, however, considerably different from ours in scope— theoretical and range—as focused solely on financial crises. Our study is empirical and considers all types of shocks.

Even though the literature on the impact of market-based versus bank-based economies on economic recoveries is limited, some economic models provide relevant insights. The main theoretical arguments in favor of the market-based economies are the following:

- Financial markets tend to be less conservative than banks in the selection of the projects they finance. The range of sectors and firms with access to financing may be larger in market-based economies than in bank-based economies. This may also lead

[7] If pre-crisis levels of public debt exceed a certain threshold, the study shows that fiscal policy may have no effect, as fiscal sustainability concerns offset the positive effect of fiscal policy.

to greater risk-taking, and economic theory suggests that that there is a growth/risk tradeoff at the efficiency frontier. Allen and Gale (1999, 2001) investigate whether financial markets or banks are better at providing financing for projects and households where there is diversity of opinion (e.g., the financing of new technologies), as the confrontation of opinions through market mechanisms leads to a better allocation of funds to the real economy. This can be relevant in non-standard situations such as economic recoveries when there are high uncertainty and a diversity of opinion, both at the macroeconomic and microeconomic level.

- Banks may exert excessive power over their clients, with potentially negative effects. For example, banks that acquire important insider information about firms are in a position to extract rent from firms through a higher cost of capital. This ability to extract part of the expected payoff from potentially profitable investments decreases the firms' incentive to produce efforts to undertake profitable projects, in particular in recovery times (Rajan, 1992).

- Academics, e.g., Levine (2000), have argued that market-based economies tend to offer more sophisticated, flexible and tailor-made risk management solutions, which may be essential in uncertain times (though obviously the crisis has illustrated the possible failure of such risk management, notably in good times). Banks' risk management solutions tend instead to be cheaper but more standardized.

On the other hand, the main theoretical arguments in favor of bank-based systems revolve around asymmetric information and agency problems. Long-term relations between firms and banks, and scale effects due to the size of the loans provide larger incentives to banks to find information about the firms, compared to individual investors. Allen and Carletti (2008) explain that the importance of equity ownership by financial institutions in Japan and Germany, and the lack of a strong market for corporate control in these countries have resulted in banks acting as outside monitors for large corporations.[8] The arguments presented here are relevant to the entire business cycle, and may not matter more specifically in uncertain times such as recoveries.

To shed further light on how the financial structure of economies affects economic recoveries, we test whether the speed of recoveries differs significantly between bank-based and market-based economies.

[8] In Japan and Germany, these systems are respectively known as the "main bank system" and the "hausbank system".

III. Financial Structure and Recoveries

A. Recoveries

Our sample includes 84 recoveries for the 1960-2007 period across a sample of 17 countries.[9] The dating of recoveries is based on the April 2009 World Economic Outlook (WEO) database (IMF, 2009).

The IMF (2009) classification uses a traditional methodology to date the business cycles, based on the BBQ methodology.[10] Turning points—peaks and troughs—correspond to local maxima and minima in quarterly real GDP growth and meet the following conditions. First, a cycle has a minimal duration of five quarters. Second, a phase—expansion or recession—has a minimal duration of two quarters. For the purpose of our analysis, we tighten the latter condition and focus on "durable" recoveries, that is, with a minimum duration of four quarters, thus excluding 6 recovery episodes that lasted only two or three quarters.

B. Market-based vs. bank-based financial systems

Measures of what is a market-based economy compared to a bank-based economy are quite varied in the literature, with no clear consensus on the most relevant definition.

- Empirical studies covering large country samples, i.e., including developing and low income countries, face financial data availability constraints. The classification of countries (for example, Levine 2000) is guided by available data: domestic equities traded, deposit money bank credit to the private sector, stock market capitalization and the overhead cost of the banking sector. Bond markets are usually omitted, for lack of available data.[11]

- Other studies (e.g., Schmidt, Hackethal, and Tyrel, 1997) focus on measures of financial intermediation, for example, those developed by central banks.[12] However, by including non-bank financial institutions such as mutual and pension funds, they can blur the distinction between market and bank financing.

We classify national financial systems as market-based or bank-based according to the relative weight of market financing and bank lending in the financing of the non-financial

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[9] Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Italy, Japan, Netherlands, Norway, Portugal, Spain, Sweden, the United Kingdom, the United States.

[10] "BBQ" stand for "Bry-Boschen procedure for quarterly data". It is an extension of the long-standing tradition of Burns and Mitchell (1946) to date business cycles.

[11] Low- and lower middle-countries typically have developed public bond markets and no private bond markets (see, for example, Beck and Demirguc-Kunt, 2009).

[12] For example, the Banque de France proposes measures of financial intermediation: http://www.banque-france.fr/fr/statistiques/titres/titres-comptesfi-intermediation.htm.

private sector, using the OECD's National Financial Accounts data. A country is classified as market-based when funding to the non-financial private sector from market sources exceeds funding from banks, based on average values in the 5 years before the global recession (2002-2007).

This measure of the financial system structure has several advantages:

- It focuses on a key macroeconomic role of financial systems: the provision of financing to the real economy. We exclude the public sector and the private financial sector from our measure, as their credit constraint is very different than for the rest of the economy.
- Our variable provides a more complete measure of market financing, by including both bond market and equity market indicators.
- It avoids "price effect" distortions that appear in market capitalization data by relying on book values instead of market value.

Seven countries are market-based and ten countries are bank-based (Figure 1 and Table 1).

- Australia, Canada, Denmark, Finland, France, the United Kingdom, and the United States are classified as market-based.
- Austria, Belgium, Germany, Italy, Japan, Netherlands, Norway, Portugal, Spain and Sweden are bank-based.

Table 1. Private Sector Financing, 2002-2007 1/

	Liabilities to		
	Markets	Banks	***Measure***
	(average, in percent)		
Australia 2/	0.68	0.32	1
Austria	0.34	0.66	0
Belgium	0.26	0.74	0
Canada 3/	0.64	0.36	1
Denmark	0.56	0.44	1
Finland	0.58	0.42	1
France	0.53	0.47	1
Germany	0.39	0.61	0
Italy 3/	0.42	0.58	0
Japan 3/	0.44	0.56	0
Netherlands	0.48	0.52	0
Norway	0.43	0.57	0
Portugal	0.29	0.71	0
Spain	0.3	0.7	0
Sweden	0.45	0.55	0
United Kingdom	0.62	0.38	1
United States	0.73	0.27	1

Sources: National Financial Account, OECD.

1/ Private Sector financing, Liabilities to the market: Securities other Shares, except Financial Derivatives (F33) and Quoted Shares(F511), Liabilities to the Banks: Loans (F4). Financial Sector Excluded. Non consolidated data.

2/ No Non-Consolidated data for Australia. We use consolidated data for Australia instead.

3/ F511 not available for Canada, Italy and Japan. F511 is estimated based on the more aggregated data F51 (Shares and other equities, except mutual fund shares) and on the assumption that F511/F51 is roughly constant in our sample.

The clustering of countries in the two categories is largely as expected and consistent with existing literature (for instance, Loyola et al., 1997; Koeter and Wedow, 2010; Baliga and Polak, 2003).

Because of data limitations, we purport that the classification of a country in bank-based or market-based is structural and constant over time. This is a possibly strong assumption,

especially for countries that are borderline (such as France, Finland or Denmark), as substantial shifts in the organization of the financial sector may have occurred over the long sample under consideration. A further issue comes from the definition of market-based and bank-based financing based on the nature of the instruments used (stocks, bonds or bank loans), which may overestimate the amount of market-based financing, especially where bond financing has tax advantages over bank loans (e.g., in Portugal, the former is exempt of stamp tax whereas the latter is not) which leads banks to lend to the corporate sector by buying bonds from the issuer in private placements. This could mean that a nontrivial share of bond financing may in fact be covert bank lending.

Given the sensitivity of the classification to data sources, in particular for countries in the middle of our sample, we identify two groups that maximize within-group homogeneity: "strongly market-based" economies and "strongly bank-based" economies. Four countries are strongly market-based—the United States, Australia, Canada, and the United Kingdom—and four are strongly bank-based—Belgium, Portugal, Spain, and Austria.

Figure 1. Private Sector Financing, 2002-2007

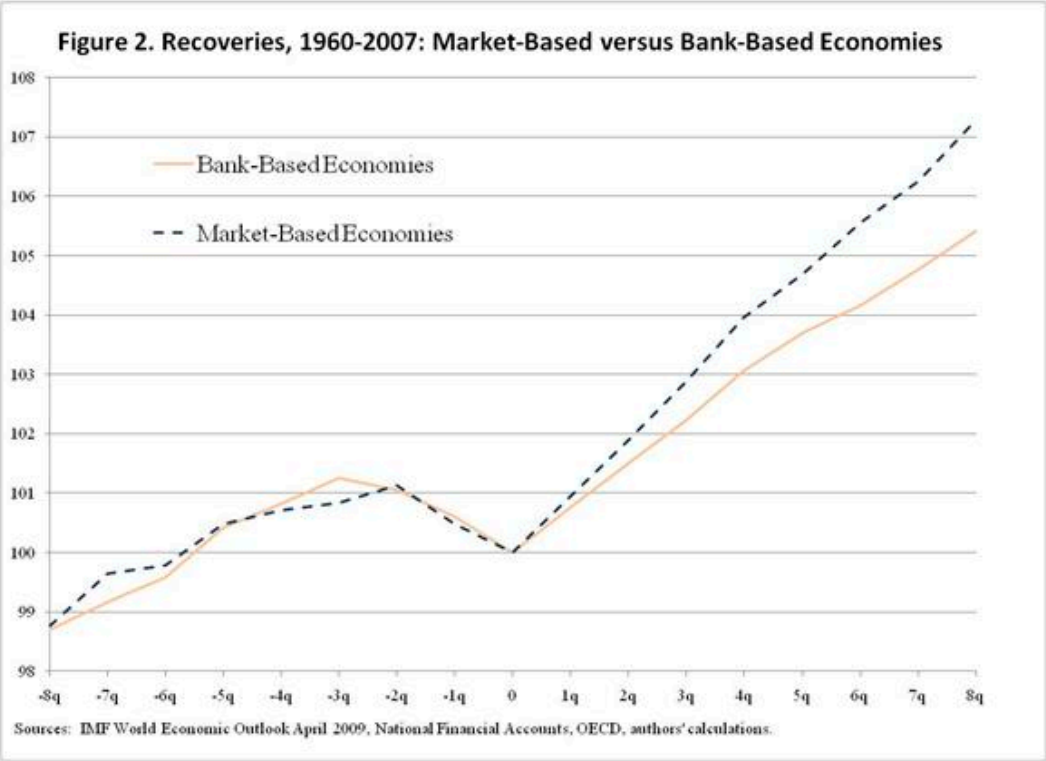
Sources: National Financial Accounts, OECD, authors' calculations.

C. Financial Structure and Recoveries: Some Stylized Facts

Over the 1960-2007 period, we have 35 episodes of recoveries for the market-based economies and 49 episodes for the bank-based economies, as indicated in Table 2. Stylized facts are identified for both bank-based and market-based economies:

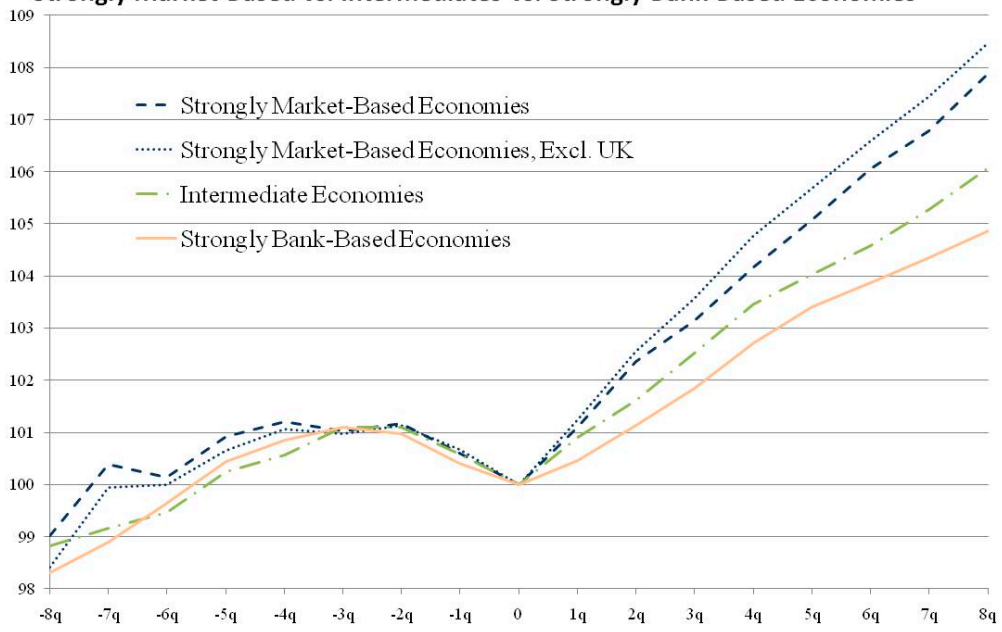
- Four quarters into recoveries, the cumulative GDP growth gap is 0.8 percent between market-based and bank-based economies (see Figure 2): market-based economies reach an average cumulative growth of 3.9 percent while bank-based economies achieve only 3.1 percent growth.

- This gap widens to 1.9 percent two years after the trough, with an average cumulative growth of 7.3 percent for market-based economies and 5.4 percent for bank-based economies.[13]



[13] The U.K. is an outlier among market-based economies, with much slower recoveries than other countries. Its cumulative growth rate of output four quarters after troughs is 1.7 percent, i.e., 2.2 percentage points below the average market-based economy. This may be explained by the fact that all four recoveries and preceding recessions of the British economy are classified as globally synchronized and/or financial crisis, which tends to lead to more sluggish recoveries. If we exclude the United Kingdom from our sample, the gap between market-based and bank-based economies widens to 1.1 and 2.1 percent four and eight quarters after the trough. Diverging migration and population growth patterns between countries may provide another explanation. The most market-based economies (the United States, Australia and Canada) also happen to have strong net population growth, while the United Kingdom is the only country in that group with strong emigration.

Figure 3. Recoveries, 1960-2007
Strongly Market-Based vs. Intermediates vs. Strongly Bank-Based Economies



Sources: IMF World Economic Outlook April 2009, National Financial Accounts, OECD, authors' calculations.

Table 2. Recoveries, 1960-2007: Market-Based vs. Bank-Based

	Number of Recoveries	Cumulative Growth	
		4 Q toTrough	8 Q to Trough
Market-based countries		in percent	
Australia	7	5.5	9.5
Canada	2	3.5	7.1
Denmark	7	4.6	7.9
Finland	5	3.1	6.0
France	4	2.8	5.0
United Kingdom	4	1.7	5.5
United States	6	4.4	7.8
Total/Average	**35**	**3.9**	**7.3**
Excluding UK	31	4.2	7.5
Bank-based countries			
Austria	6	2.9	5.1
Belgium	7	2.8	4.2
Germany	6	3.4	7.1
Italy	9	3.5	5.9
Japan	3	2.2	4.5
Netherlands	4	4.2	5.2
Norway	3	3.2	4.9
Portugal	4	2.8	6.6
Spain	4	2.1	4.1
Sweden	3	2.6	6.3
Total/Average	**49**	**3.1**	**5.4**

Sources: IMF World Economic Outlook April 2009, National Financial Accounts, OECD, authors' calculations.

Table 3. Recoveries, 1960-2007: Strongly Market-Based vs. Intermediate vs. Strongly Bank-Based Economies

	Number of Recoveries	Cumulative Growth	
		4 Q toTrough	8 Q to Trough
Strongly Market-based countries		in percent	
United States	6	4.4	7.8
Australia	7	5.5	9.5
Canada	2	3.5	7.1
United Kingdom	4	1.7	5.5
Total/Average	**19**	**4.2**	**7.9**
Excluding UK	15	4.8	8.5
Intermediate countries			
Finland	5	3.1	6.0
France	4	2.8	5.0
Netherlands	4	4.2	5.2
Sweden	3	2.6	6.3
Denmark	7	4.6	7.9
Japan	3	2.2	4.5
Norway	3	3.2	4.9
Italy	9	3.5	5.9
Germany	6	3.4	7.1
Total/Average	**44**	**3.5**	**6.1**
Strongly Bank-based countries			
Austria	6	2.9	5.1
Spain	4	2.1	4.1
Portugal	4	2.8	6.6
Belgium	7	2.8	4.2
Total/Average	**21**	**2.7**	**4.9**

Sources: IMF World Economic Outlook April 2009, National Financial Accounts", authors' calculations.

- The difference is more marked when comparing strongly market-based to strongly bank-based economies. The cumulative growth gap is 1.5 percentage points after 4 quarters and reaches 3 percentage points (up to 3.6 percentage points when the United Kingdom is excluded) after 8 quarters.

IV. Are Markets the Phoenixes and Banks the Lame Ducks of Recoveries?

A. Does the Financial Structure of an Economy Matter for Recoveries? Empirical Evidence from 50 Years of Recoveries

We test empirically how the structure of the financial system affects the speed of economic recoveries after the recessions. We run a number of regressions of the cumulative growth rate after a crisis against our financial sector measure and a set of control variables. Our sample comprises of 84 recovery episodes (35 for market-based economies and 49 for the bank-based economies) over the 1960-2007 period.

The baseline specification is as follows:

$$G_{kQi} = a_0 + a_1 MB_C + a_2 FC_i + a_3 Amp_i + a_4 Spend_i + e_i$$

where:

G_{kQi} is the cumulative growth rate of output k quarters after the trough of recovery *i.* We run the regression for two values of *k:* 4 and 8 quarters.[14]

MB_C is a variable indicating if country *c* is classified as market-based. The default specification uses a dummy variable for *MBc,* which takes value 1 for market-based economies. Robustness checks are run using a linear variable (equal to the share of financing coming from financial markets relative to banks) and using a dummy variable that takes value 1 for strongly market-based economies.

The set of control variables is drawn from the literature on recoveries.

[14] Given that the sample straddles very different periods of growth, ranging from post-war catch-up to the great moderation and very different country circumstances, time and country fixed effects may be important. Our econometrics control for this with a robustness check that conducts the analysis for actual growth discounted by potential growth (captured as average annual growth rate over the 5-year period preceding the observation). Results are similar to those reported here using actual growth rates. This robustness check has the additional benefit of correcting for a potential endogeneity problem between the structure of the financial system and economic growth—i.e., that faster growing economies tend to be more conducive to the development of market institutions and, therefore, to more market financing. Another potential bias in our analysis comes from diverging migration and population growth patterns between countries with, as noted above, the most market-based economies also having the strongest population growth. An extension of our work could be to control for this by using per capita variables.

FC_i is a dummy variable indicating if recovery *i* is associated to a financial crisis. These are identified using the list of the financial crises in IMF (2009), which relies on Reinhart and Rogoff (2008a, 2008b)'s narrative analysis.

Amp_i measures the amplitude of the recessions preceding the crises included in our sample. The variable is equal to the cumulative loss in aggregate output from peak to trough in the recession preceding recovery *i.* [15] [16]

$Spend_i$ proxies the policy response during the crisis, by measuring the change in the primary structural balance of the government between the peak and the trough of the recession preceding recovery *i.* This measure comes from IMF (2009).

Results confirm that market-based economies recover faster than bank-based economies. Tables 4 and 4bis provide a full description of the results. The main results are as follows:

- Market-based economies are associated with faster recoveries—with a difference estimated at 0.7 percentage points of cumulative growth 4 quarters after the trough and 1.4 percent 8 quarters after the trough. Without the United Kingdom, the coefficients increase further to 0.9 and 1.6 percentage points. All but one of the coefficients are significant at the 5 percent level. One possible explanation for this could be usual post-crisis regulatory zeal and the extent that financial crises affect the banks' balance sheets.

- When distinguishing strongly market-based economies from strongly bank-based ones, the difference between the two groups of countries is more marked. This confirms the initial results. After 4 quarters, strongly market-based economies experience a positive growth differential estimated at 1.4 percentage points, which widens to 2.7 percentage points after 8 quarters.

- The comparative advantage of the market-based economies tends to be stable over the 8 quarters, instead of eroding on the 5^{th} to 8^{th} quarters after the trough. Independently of the specification used, the cumulative growth rate gap between market- and bank-based economies in the two years after the trough roughly equals the double of the spread in the cumulative growth rate one year after.

- The results also suggest that there may be a threshold effect. This may be inferred from a comparison between the linear version of our financial system variable to the

[15] We decided not to include a variable reflecting the duration of the preceding recession to avoid overloading the specification. Amplitude and duration of the recessions are correlated so we kept the more significant of these two variables.

[16] As discussed above, there may be a risk/growth tradeoff at the efficiency border, with market-based systems taking more risks and possibly experiencing both larger recessions and stronger rebounds. We control for this in different ways. First, the amplitude variable controls for the nature of the preceding recovery. Second, we conducted robustness checks looking at the time required to return to pre-crisis output levels and to output levels implied by extrapolation of pre-recession growth rates. The results are largely consistent and therefore not reported here for the sake of conciseness—available upon request from the authors.

specification that distinguishes between strongly market- and strongly bank-based economies. A higher share of market financing is associated with faster recoveries, but the results are less statistically significant. The dummy variable captures a larger part of the comparative advantage of market-based economies compared to the linear measure. This suggests that there may be a threshold from which the marginal gain of becoming more market-based increases sharply.

Of the coefficients of the three control variables all but the amplitude variable have the expected signs:

- Recoveries associated with financial crises tend to be more sluggish than the others, as indicated by the negative sign for the financial crisis dummy.

- Higher amplitude in the recession leads to more sluggish recoveries, which is in contradiction with past studies.

- Contra-cyclical fiscal policy tends to increase the speed of economic recoveries after the recessions

- .

Table 4. Impact of the Financial System Structure on the Speed of Economic Recoveries
1960-2010

	Cummulative Growth into Recovery Phase					
	Full Sample					
	4 Quarters	8 Quarters	4 Quarters	8 Quarters	4 Quarters	8 Quarters
Market-based Dummy	0.66	1.38**				
	(1.56)	(2.07)				
MB vs BB Linear Measure			2.79*	5.68**		
			(1.94)	(2.51)		
Strongly MB vs Strongly BB					1.39**	2.72***
					(2.39)	(3.01)
Financial Crisis	-2.07***	-2.79***	-2.09***	-2.81***	-3.22***	-4.40**
	(-3.28)	(-2.80)	(-3.33)	(-2.85)	(-2.91)	(-2.55)
Recession Amplitude	-0.36***	-0.55***	-0.34***	-0.53***	0.029	-0.13
	(-2.96)	(-2.87)	(-2.87)	(-2.81)	(0.13)	(-0.39)
Government Consumption	0.16*	0.36**	0.17*	0.37**	0.34**	0.54**
	(1.81)	(2.49)	(1.90)	(2.64)	(2.52)	(2.60)
N	85	84	85	84	41	41
R_2	0.43	0.41	0.41	0.41	0.67	0.56

Note: T-tests are reported under parentheses. ***,**, and * indicate significance at the 1, 5, and 10 percent level, respectively.

Table 4bis. Impact of the Financial System Structure on the Speed of Economic Recoveries
1960-2010

	Cummulative Growth into Recovery Phase (Excluding UK)					
	4 Quarters	8 Quarters	4 Quarters	8 Quarters	4 Quarters	8 Quarters
Market-based Dummy	0.93**	1.59**				
	(2.20)	(2.32)				
MB vs BB Linear Measure			3.58**	6.26***		
			(2.49)	(2.72)		
Strongly MB vs Strongly BB					1.82***	3.06***
					(3.14)	(3.29)
Financial Crisis	-2.06***	-2.76***	-2.08***	-2.78***	-2.62**	-3.39
	(-3.18)	(-2.65)	(-3.23)	(-2.71)	(-2.04)	(-1.64)
Recession Amplitude	-0.41***	-0.64***	-0.40***	-0.62***	-0.18	-0.54
	(-3.37)	(-3.23)	(-3.26)	(-3.17)	(-0.71)	(-1.30)
Government Consumption	0.15*	0.36**	0.16*	0.38***	0.25*	0.43*
	(1.70)	(2.49)	(1.84)	(2.67)	(1.83)	(1.92)
N	81	80	81	80	37	37
R_2	0.53	0.49	0.50	0.49	0.73	0.64

Note: T-tests are reported under parentheses. ***,**, and * indicate significance at the 1, 5, and 10 percent level, respectively.

B. How Much is Explained by Real Sector Flexibility? Testing for Robustness with Additional Control Variables

Up to this point, the paper has analyzed how the financial structure of an economy interacts with the dynamics of recoveries. We found that market-based economies are associated with durably faster recoveries. However, inferences for policymaking rest importantly on whether financial variables are the reflection of real sector ones. In particular, to what extent are our results for market-based economies driven by a broad degree of economic flexibility and by the nature of the recessions which precede recoveries?

A second set of control variables is used to assess whether our financial market structure variable may be capturing other economic characteristics, in particular the extent of economic flexibility and to explore to what extent the dynamics of recessions may be determinant for economic recoveries.

We successively add three supplementary variables to the baseline specification.

$$G_{kQi} = a_0 + a_1 MB_C + \hat{a}\hat{X} + a_5 Labor_i + e_i \quad (1)$$

$$G_{kQi} = a_0 + a_1 MB_C + \hat{a}\hat{X} + a_5 Product_i + e_i \quad (2)$$

$$G_{kQi} = a_0 + a_1 MB_C + \hat{a}\hat{X} + a_5 Synchro_i + e_i \quad (3)$$

$$G_{kQi} = a_0 + a_1 MB_C + \hat{a}\hat{X} + a_5 FC_i . MB_C + e_i \quad (4)$$

Where:

- $\hat{a}\hat{X}$ is a vector of the three control variables used in the baseline specification, i.e., $FC_{i,}$ $Amp_{i,,}$ and $Spend_i$.
- $Labor_i$ measures the strictness of employment protection—providing a proxy for labor flexibility.
- $Product_i$ measures the degree of goods market regulation—used to control for general economic flexibility.
- $Synchro_i$ is a dummy variable indicating synchronized recoveries associated with synchronized recessions. IMF (2009) shows that internationally synchronized episodes are associated with more sluggish recoveries. We use their list of internationally synchronized recessions, 1975, 1980, 1992 and we add 2001 (12 out of the 17 countries in our sample enter into a recession after the Dot-Com bubble burst).
- $FC_i . MB_C$ is an interaction variable between an indicator variable for financial crises and the measure of financial market structure, which captures the extent to which financial structures affect recoveries when the preceding crisis was a financial crisis.

The coefficients for the control variables have the expected signs. Synchronized crises result in more protracted recoveries. Labor market flexibility allows for faster recoveries, while evidence is unclear about product market regulation. However, given that a number of coefficients are not significant in this extended version of our econometric model, considerable caution in their interpretation needs to be kept in mind.

The first set of results, shown in Table 5 and which control for the crisis characteristics, largely confirm our previous findings:

- The comparative advantage of market-based economies is larger during episodes of synchronized recessions than during non-synchronized recessions. With the $Synchro_i$ variable, the coefficient of the variable MB_C is smaller in (1) compared to the baseline specification. This may be explained by the fact that countries are less able to export their way out of recessions during synchronized crises—therefore more dependent on domestic sources of demand, including through domestic financing.

- The coefficients for the interaction variable are not significant, yet negative. With this specification, the coefficient for the market-based variable increases. While this needs to be interpreted with caution, it may suggest that the impact of market-based economies is lesser in periods of financial crisis, possibly because of greater reliance on the financial sector.

The second set of results (Table 6) finds that stronger recoveries in market-based economies are associated to other economic features, in particular the flexibility of the real economy. When employment and product market flexibility are taken into account, the comparative advantage of market-based economies in recoveries becomes less significant:

- After the labor market regulation variable is included, coefficients for all three measures of financial market structure become insignificant—possibly suggesting that our base specification is not robust to measures that capture economic flexibility.

- Controlling for labor flexibility reduces the comparative advantage of market-based economies in recoveries by roughly 40 percent, both 4 quarters and 8 quarters after the trough.[17]

While these additional results are tentative, they do provide some guidance for policymakers. First, because financial crises are more costly in terms of slow recoveries, the development of financial markets must be accompanied by measures to enhance the stability of financial markets. Second, focusing solely on financial markets would be shortsighted, as other macroeconomic conditions matter.

[17] One potential explanation was raised by R. Rajan (2010) who highlights that countries with poor employment protection legislation and social safety nets face greater pressure for large and prolonged countercyclical policies, to generate stronger and faster recoveries. This may be the case where low employment protection is more prevalent in market-based economies.

Table 5. Impact of the Financial System Structure on the Speed of Economic Recoveries
1960-2010

	Cummulative Growth into Recovery Phase											
	Full Sample											
	4 Quarters	8 Quarters	4 Quarters	8 Quarters	4 Quarters	8 Quarters	4 Quarters	8 Quarters	4 Quarters	8 Quarters	4 Quarters	8 Quarters
Market-based Dummy	0.59	1.22*					0.91**	1.76**				
	(1.39)	(1.84)					(2.04)	(2.48)				
MB vs BB Linear Measure			2.47*	4.79**					3.2*	5.9*		
			(-1.66)	(2.08)					(2.16)	(2.52)		
Strongly MB vs Strongly BB					1.38**	2.19**					1.51**	2.73***
					(2.17)	(2.26)					(2.53)	(2.89)
Synchronised Recession	-0.49	-1.30*	-0.4	-1.12	0	-1.4						
	(-1.11)	(-1.90)	(-0.89)	(-1.61)	(0)	(-1.39)						
FC*Market-based Measure							-0.02	-0.03	-0.07	-0.04	-0.02	0
							(-1.6)	(-1.49)	(-1.17)	(-0.4)	(-0.9)	(-0.03)
Financial Crisis	-2.16***	-3.01***	-2.16***	-3***	-3.22***	-4.9***	-1.22	-1.53	1.16	-1.04	-1.85	-4.32
	(-3.39)	(-3.05)	(-3.4)	(-3.05)	(-2.82)	(-2.81)	(-1.48)	(-1.17)	(0.41)	(-0.23)	(-0.99)	(-1.46)
Recession Amplitude	-0.41***	-0.68***	-0.39***	-0.65***	0.03	-0.28	-0.37***	-0.57***	-0.37***	-0.55***	0.01	-0.13
	(-3.17)	(-3.40)	(-2.98)	(-3.23)	(0.12)	(-0.79)	(-3.12)	(-3.02)	(-3.05)	(-2.82)	(0.03)	(-0.38)
Government Consumption	0.18*	0.39***	0.18**	0.4***	0.34**	0.55***	0.16*	0.35**	0.16*	0.37***	0.33**	0.54**
	(1.92)	(2.73)	(1.99)	(2.84)	(2.49)	(2.66)	(1.73)	(2.42)	(1.82)	(2.6)	(2.46)	(2.56)
N	84	84	84	84	41	41	84	84	84	84	41	41
R_2	0.45	0.42	0.42	0.42	0.69	0.57	0.44	0.41	0.42	0.42	0.68	0.57

Note: T-tests are reported under parentheses. ***,**, and * indicate significance at the 1, 5, and 10 percent level, respectively.

Table 6. Impact of the Financial System Structure on the Speed of Economic Recoveries
1960-2010

	Cummulative Growth into Recovery Phase											
	Full Sample											
	4 Quarters	8 Quarters	4 Quarters	8 Quarters	4 Quarters	8 Quarters	4 Quarters	8 Quarters	4 Quarters	8 Quarters	4 Quarters	8 Quarters
Market-based Dummy	0.40	0.84					0.71	1.38				
	(0.72)	(0.96)					(1.20)	(1.47)				
MB vs BB Linear Measure			2.78	5.4					3.56*	6.8**		
			(1.11)	(1.37)					(1.72)	(2.08)		
Strongly MB vs Strongly BB					2.34	5.48*					3.98***	5.76***
					(1.15)	(1.74)					(3.14)	(2.82)
Employment Protection	-0.29	-0.61	0	-0.07	0.57	1.65						
	(-0.73)	(-0.97)	(0)	(-0.09)	(0.49)	(0.92)						
Product Market Regulation							0.17	0	0.01	0.01	0.05**	0.06*
							(-0.14)	(0)	(0.52)	(0.48)	(2.27)	(1.65)
Financial Crisis	-2.06***	-2.76***	-2.09***	-2.81***	-3.35***	-4.77***	-2.09***	-2.79***	-2.13***	-2.86***	-2.81***	-3.92***
	(-3.25)	(-2.77)	(-3.3)	(-2.83)	(-2.92)	(-2.69)	(-3.26)	(-2.77)	(-3.35)	(-2.87)	(-2.65)	(-2.29)
Recession Amplitude	-0.35***	-0.54***	-0.34***	-0.53***	0.04	-0.1	-0.36***	-0.55***	-0.35***	-0.54***	-0.06	-0.24
	(-2.90)	(-2.82)	(-2.85)	(-2.79)	(0.18)	(-0.28)	(-2.92)	(-2.82)	(-2.9)	(-2.83)	(-0.29)	(-0.69)
Government Consumption	0.16*	0.35**	0.17*	0.37***	0.33**	0.52**	0.16*	0.36**	0.17*	0.37***	0.28**	0.47**
	(1.77)	(2.45)	(1.88)	(2.6)	(2.41)	(2.45)	(1.78)	(2.47)	(1.88)	(2.62)	(2.15)	(2.28)
N	84	84	84	84	41	41	84	84	84	84	41	41
R_2	0.45	0.42	0.43	0.43	0.68	0.58	0.44	0.42	0.42	0.42	0.69	0.57

Note: T-tests are reported under parentheses. ***,**, and * indicate significance at the 1, 5, and 10 percent level, respectively.

V. CONCLUDING REMARKS

Our paper suggests that, among advanced countries, market-based economies recover significantly faster than bank-based economies. This result holds even after controlling for other factors such as the nature of the crisis, the policy response, and the degree of economic flexibility. Market-based economies are associated with a gain in cumulative economic growth of 0.4 to 0.7 percentage point on average after a year of recovery, and of 0.8 to 1.4 percentage points two years into the recovery.

Our results complement the existing literature on the drivers of recoveries and give some indication about the current macroeconomic environment. As pointed out by others (IMF, 2009; Reinhart and Rogoff, 2010), financial crises tend to be more protracted and followed by slower recoveries than others, especially when associated with housing busts. The synchronization of crises imposes a further drag on recoveries. However, the situation varies substantially across countries, as illustrated with the current multi-speed recovery. We find that differences in financial systems are a significant factor behind country divergences.

In terms of policy implications, our analysis suggests that banking sector repair is paramount to avoid slow and protracted recoveries, especially in bank-based economies due to the slow recovery in bank lending after crises. It is also a reminder that, while market financing needs to be well supervised, it does provide a useful complement to bank financing.

Much research remains to be done on these issues. It would be useful to identify more accurately the channels through which market-based economies build their comparative advantage.

APPENDIX—DATA CONSIDERATIONS

Business Cycles:

- We use the April 2009 World Economic Outlook database for the dating of the peaks and troughs. To focus on "durable" recoveries, we add the condition that a phase should last at least four quarters, instead of two in the IMF WEO (2009). For this reason, we exclude 6 recovery episodes.

- The identification of the financial crises was based on the IMF WEO (2009).

- We rely on the IMF WEO (2009) to determine which recessions are synchronized. We add 2001 as a synchronized episode as 12 out of the 17 countries entered into a recession.

Measure Market-Based / Bank-Based:

This measure is built using the non consolidated Financial National Account database.

- The share of market financing is estimated as the sum of "Securities other than Shares, except Financial Derivatives" (F33) and "Quoted Shares" (F511).

- For the share of market lending, we take "Loans - Financial Sector Excluded" (F4).

To compensate for the missing data in the non consolidated Financial National Account database, we use similar data from the same database.

- "Quoted Shares" (F511) was missing for Canada, Italy and Japan. To approximate the missing value, we took "Shares and Equity, except Mutual Fund" (F51) which is an aggregate value composed of "Quoted Shares" and some other elements. We computed that for the 14 countries displaying values for both F511 and F51, F511 accounted for roughly 40 percentage points of F51. We proxy the missing data for "Quoted Shares" (F511) as follows: "Shares and Equity, except Mutual Fund"x0.4.

- For Australia, the non consolidated data were missing. We took the consolidated data in the Financial National Account database.

Control Variables:

- We use IMF WEO (2009) data for "Government Spending".

- We use the OECD data "Strictness of Employment Protection – Overall, version 3".

- We use the OECD data "Product Market Regulation".

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