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Regional implications of financial market development: Industry location and income inequality

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ABSTRACT

We develop a heterogeneous-firms model with trade in goods, labor mobility and credit constraints due to moral hazard. Mitigating financial frictions reduces the incentive of mobile workers to migrate to one region such that an unequal distribution of industrial activity becomes less likely. Hence, financial market development has opposite regional implications as trade liberalization. While the former leads to more dispersion of economic activity across space, the latter tends to drive clustering. This has immediate implications for income inequality both between regions and workers. According to our model, financial development reduces inequality in both dimensions.

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1. Introduction

There has been a long and still unsettled debate whether the integration of markets leads to a more or less equal distribution of economic activity and thus income across regions. While the conventional view suggests that market integration should lead to convergence and thus more equal living conditions, there is also a prominent opposition claiming that market integration magnifies inequality (Myrdal, 1957; Lewis, 1977; Krugman, 1991). The latter argument fuels policy makers' fears that market integration benefits primarily rich regions with a large home market. Accordingly, many federations have regional policies in place that transfer resources from the core to peripheral regions. For instance, the European Union spends about 50 billion euros per year on regional cohesion representing about one third of the overall EU budget.¹ In Germany, it is even fixed in the constitution that governments have to ensure sufficiently equal living conditions across regions. There is surprisingly little work that links the role of financial markets to this debate. It is surprising because

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¹ Regional cohesion is the second largest item of the EU budget amounting to more than 350 billion euros during 2007–2013 and 336 billion euros during 2014–2020 (see [EU Commission, 2011](#)).

the importance of the financial sector for the real economy is widely acknowledged and we have seen a very pronounced development of financial markets in recent decades.

We show that more developed financial markets work towards more equality of income both within and across regions. The underlying economic mechanism for these results builds on access to external finance. Deeper financial markets allow less productive firms to secure external finance and enter the market. This raises the total number of firms, but reduces the *share* of exporters as only high-productive companies serve customers abroad. Thus, better access to external finance modifies the composition of firms and thereby the intensity of competition within and between markets. We show that this channel reduces agglomeration economies working towards more income equality.

As trade liberalization raises the share of exporters, a reduction in transport costs stimulates regional inequality. The latter represents a well-known mechanism in economic geography models with homogeneous firms (Krugman, 1991; Ottaviano et al., 2002). Our findings have substantial relevance for (regional) policy makers. First, deeper financial markets allow for more integrated product markets (that promise welfare gains from trade) without jeopardizing the goal of equal regional living conditions. Second, financial development may serve as a substitute for costly regional transfer programs with the goal of establishing cohesion.

Our model features trade in goods, labor migration, credit constraints, endogenous entry and exit of heterogeneous firms, and occupational choice (for the latter see Lucas, 1978; Egger and Kreickemeier, 2012). The financial friction stems from a moral-hazard problem in the tradition of Holmstrom and Tirole (1997). While entrepreneurs can choose their effort level to maximize their payoff, lenders cannot directly observe their behavior. Hence, asymmetric information introduces credit constraints as lenders demand a higher return from a given investment to ensure a higher payoff for entrepreneurs and thus diligent behavior. This leads to credit rationing as less productive firms cannot commit to diligence despite positive net present values. To obtain these selection effects, we need to introduce some kind of firm heterogeneity. We deviate from Holmstrom and Tirole (1997) in ignoring different endowments of firm assets, but rather follow Melitz (2003) in introducing different levels of productivity. Firm selection is thus an important channel through which financial development affects the spatial distribution of industry and welfare. Baldwin and Okubo (2006) and Ottaviano (2011, 2012) have stressed the importance of firm heterogeneity for the magnitude of agglomeration economies in the absence of financial frictions. In our model, entrepreneurs of productive (large) firms have no incentive to shirk and always receive external finance while small firms turn out to be credit constrained.

Our findings are in line with the recent literature in trade and finance arguing that deeper financial markets increase the volume of exports.² However, what matters for location decisions and our main results is the *share* of exporters rather than the *volume*. Building on recent evidence that the smallest (i.e. less productive) firms benefit most from financial development (Beck et al., 2005, 2008), the link between better access to external finance and a lower *share* of exporters becomes well-founded.

By examining the role of financial development for the location of industries, our paper contributes to the literature on determinants of agglomeration (see Duranton and Puga, 2004; Ottaviano and Thisse, 2004; Puga, 2010, for reviews of the literature). It fits into the line of research stressing the importance of market externalities as a driver for migration and economic density.³ The link between economic geography and policy was established in papers that analyzed among others the role of tax competition (Baldwin and Krugman, 2004), infrastructure (Martin, 1999), economic growth (Martin and Ottaviano, 2001) and labor market institutions (Egger and Seidel, 2008). A related paper to ours is Hakenes and Kranich (2014) studying moral hazard and capital mobility, but without selection effects. In their framework investors need to incentivize managers which is less costly in industrialized regions. Our paper highlights the interactions between financial market institutions, firm heterogeneity, and migration that have not been analyzed so far.

The role of financial market integration for inequality has also been addressed in the literature on finance, growth, and development. Acemoglu and Zilibotti (1997) argue that rich countries have more developed financial markets providing better diversification which contributes to a widening gap between rich and poor countries. Krugman (1981) and Lucas (1990) were early contributions to point out why difference in capital-labor ratios may magnify over time. Matsuyama (2004) develops an overlapping-generations model with credit market imperfection and investment. He shows that financial markets may cause inequality as symmetric equilibria become unstable and regions separate into rich and poor. Similarly, Boyd and Smith (1997) and Hakenes et al. (2014) integrate financial frictions in growth models and show that financial integration may cause capital to flow from poor to rich countries. This process contributes to more income inequality. In contrast to our paper, none of the above-mentioned studies considers migration which is certainly a relevant feature at the regional level. Furthermore, we highlight a novel effect of financial markets on income inequality that works via goods trade and yields predictions that are consistent with the negative correlation between financial market development and income inequality within countries identified in the empirical literature (Clarke et al., 2006; Liang, 2006; Beck et al., 2007).⁴

² See, for example, Manova (2008, 2013). Financial development raises the volume of exports, but reduces the share of exporters in our model.

³ The empirical relevance of agglomeration economies has been well documented. For instance, Ellison et al. (2010) and Redding and Sturm (2008) provide convincing evidence for demand-linkages and the home-market effect which are at the center of the location mechanism in our model.

⁴ In a working paper version of this paper, we provide empirical evidence for a negative relationship between financial market development and the concentration of economic activity across European regions. This finding is consistent with our model and suggests that financial markets play a decisive role for location decisions of firms (see Ehrlich and Seidel, 2013a).

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