

This issue of Research Highlights reviews the following subjects that have been recently analyzed at the Central Bank of Chile (CBC):

- **Productivity Gaps And Job Flows: Evidence From Censal Microdata**
- **Labor Earnings Dispersion in Chile: Decomposition, Dynamics and the Role Of Firms**
- **The Role of Domestic Macroprudential Policies in the Transmission of International Monetary Shocks**

Productivity Gaps And Job Flows: Evidence From Censal Microdata

When workers leave a job and find a new one in which, given their skills, they can be more productive, they contribute to increasing the economy's aggregate output. One of the biggest challenges facing emerging economies is developing labor markets where workers' mobility between firms helps each worker and each firm find the best possible labor linkage. This helps to improve the aggregate productivity of the economy, which, in turn, largely determines the income differences among countries.

In their paper "[Productivity Gaps and Job Flows: Evidence from Censal Microdata](#)", Central Bank of Chile economists, [Elías Albagli](#), Mario Canales, [Matías Tapia](#) and Juan M. Wlasiuk, jointly with Chicago University economist, [Chad Syverson](#), study, using Chilean microdata, workers' mobility among firms and how this can boost the country's aggregate productivity. To do so, they use anonymized tax microdata that cover the entire formal labor market and contain information on the performance of all formal firms. For the former, they use a tax dataset that reports with which firms workers have a labor contract and how much they earn. For the latter, they use a tax dataset that reports firms' sales and expenditures in order to measure the value added of each one of them.

By using these data, the authors document three main messages. First, while on average workers move to more productive firms (referred to as "moving up the productivity ladder"), there is a very significant fraction of workers who move to less productive firms when they change jobs. Actually, almost half of all job changes go to lower productivity firms. In other

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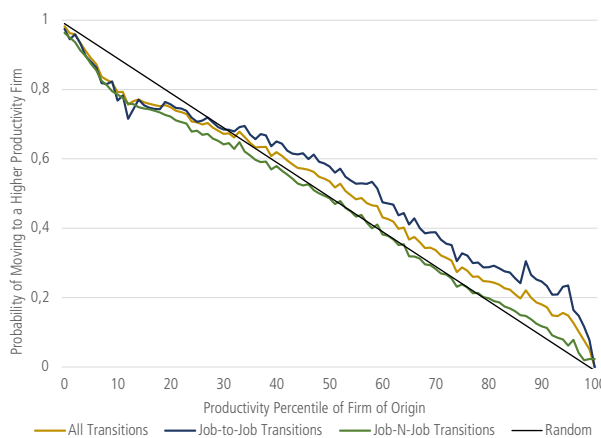
words, while the net movements of workers are to more productive firms, this masks massive gross movements in the opposite direction. It has been documented that Chile exhibits high worker mobility among firms. The evidence in this paper suggests that much of that mobility may not result in gains in terms of aggregate productivity.

Second, job changes that involve moves up the productivity ladder are highly heterogeneous. In particular, more often than not, these job changes are not mediated by periods of non-employment (either unemployment or exiting the labor force). This is consistent with job search theories where if

the worker moves from one firm to another without going through non-employment, it must be because of a voluntary decision where the new job offers better opportunities than the previous one. Furthermore, these moves up the ladder occur more frequently among high-productivity firms. Figure 1 shows the probability of scaling up to more productive firms (Y-axis) as a function of the productivity level of the worker's firm of origin (X-axis), taking as a reference the 45-degree line that represents the cases where movements are completely random. The figure shows that the probability of scaling up is (relatively) concentrated in workers leaving more productive firms. In contrast, this probability is relatively lower for workers who start from less productive firms. That is, the productive gains from labor reallocation occur mostly in the upper part of the firms' productivity distribution.

Third, job changes that move up the productivity ladder are also very heterogeneous in the type of worker involved. Job moves to higher rungs in the productivity ladder occur with much greater frequency and magnitude among young and high-skilled workers. These two groups account for the largest share of productivity increases when there are job changes and, therefore, make the largest contribution to aggregate productivity growth.

Figure 1: Productivity gaps and job flows*



* Job transitions are arranged by the firm of origin's adjusted productivity. For each percentile of this distribution, the figure plots the percentage of transitions towards firm with higher adjusted productivity.

In short, this evidence casts doubt on whether high worker mobility between firms is in itself indicative of efficiency gains in the allocation of resources in the labor market and increases in aggregate productivity. The article suggests that it is not

enough to analyze the gross mobility of workers between firms, but that it is also important to look into the direction in which these workers move, that is, up or down the companies' productivity ladder. Additional research that would help to better

understand the determinants of these outcomes, and the public policies they promote, could help to enhance the aggregate productivity growth and earnings associated with labor transitions in emerging economies such as Chile.

Labor Earnings Dispersion in Chile: Decomposition, Dynamics and The Role of Firms

The issue of income distribution has become a topic of great relevance in the public debate, both in Chile and in the rest of the world, partly stimulated by the greater availability of microeconomic data that have improved the measurement of income dispersion among individuals. Understanding the determinants and dynamics of this dispersion is of particular importance to inform public policies. One dimension recently explored in various countries is the influence of the way workers are distributed across firms, which potentially pay different wages to employees with equal characteristics. Does the workers' allocation across firms have implications for income inequality? Are skilled workers more frequently employed in firms that, on average, pay higher wages? The difficulty in analyzing these issues comes from the need to have access to databases that have detailed information not only on earnings, but also on labor relations between firms and workers.

In their paper "[Labor Earnings Dispersion in Chile: Decomposition, Dynamics and the Role of Firms](#)" Central Bank of Chile researchers Rosario Aldunate, [Gabriela Contreras](#) and [Matías Tapia](#) explore these issues by using an anonymized data base containing labor relations between firms and workers in the period 2005-2016. This is detailed information that firms must submit to the Internal Revenue Service (SII) and covers all formal employment in Chile, including a total of 650,000 firms, almost 10 million workers and 30 million labor relations between workers and firms. The richness of these data allows the authors to carry out a detailed analysis of the trajectory observed in the income distribution of formal workers, and its decomposition

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between the effects of the worker and of the firm, for more than a decade.

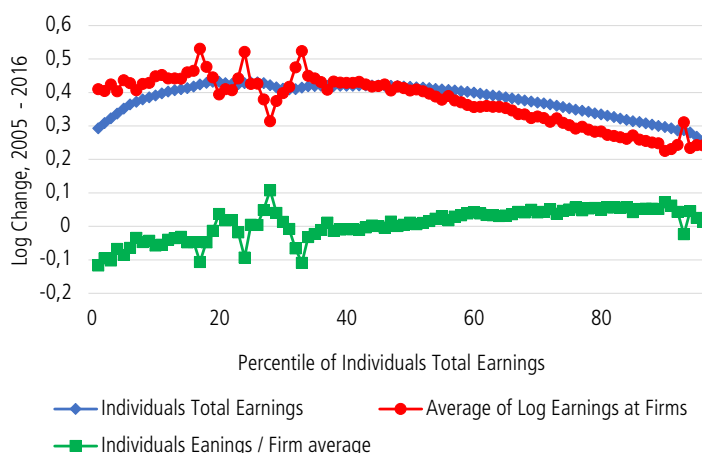
A significant finding is that the dispersion of labor income declined in the period analyzed, mainly due to more limited growth in the income of workers in the highest percentiles of the distribution. When decomposing labor income inequality between the part that is explained by differences in wages paid within a firm and the part that is explained by differences in average wages paid by different firms, it is found that the first component is the

most important in explaining total inequality, but the second component is responsible for the lower dispersion. It is also shown that most of the reduction in the dispersion of the average wage paid by firms occurred in bigger firms.

The blue line in Figure 2 shows the growth in labor income from 2005 to 2016 for each income percentile. It can be seen that growth has been slower at the two ends of the distribution, generating countervailing effects on total inequality, although the slower growth in the higher percentiles has dominated. The behavior of the blue line is decomposed into the evolution of the red and green lines. The red line shows the average wage paid by firms to workers in each of these percentiles. In general, this line is downward sloping, implying that the average wage in firms employing higher-income workers has grown less. The green line, which represents the difference between what the worker receives and the average wage the firm pays, has the opposite pattern. This effect increases the total dispersion but is not strong enough to counteract the effect of the red line.

What has explained the lower dispersion of the average wage paid by different firms? This could be due to firm-specific changes such as their

Figure 2: Change in labor income by percentile, 2005-2016*



* The figure shows the changes (in logarithms) in labor income from 2005 to 2016, by percentile. The blue line shows the total change, the red line shows the change in average income at firms hiring workers at each percentile, and the green line shows the change in income at each percentile by subtracting the average change by firm.

productivity or the complexity of their processes and tasks. Alternatively, it could be that the recruitment pattern has changed over time. Thus, workers who consistently have higher earnings because, for example, they have more human capital, may have started working more frequently than in the past in firms that consistently pay lower wages on average. In order to analyze which alternative could better

explain these observations, the authors carry out an econometric estimation that allows decomposing the wage of a specific relationship between a component associated with the characteristics of the worker and another associated with the firm. The results show that the drop in dispersion comes mainly from the second alternative: although higher-income workers work proportionally more in firms that,

irrespective of the worker's skill level, pay higher wages, this pattern has tended to be attenuated in recent times. Thus, a more even allocation of workers with different characteristics among firms has led them to pay more similar average wages, reducing the dispersion of labor income.

The Role of Domestic Macroprudential Policies in the Transmission of International Monetary Shocks

Theoretically, under perfect capital mobility and a flexible exchange rate regime, international interest rate shocks are absorbed by exchange rate fluctuations, thus avoiding a spillover to domestic variables. However, there is ample empirical evidence demonstrating the effect of foreign monetary policy on domestic macroeconomic aggregates, especially in the case of emerging economies. Among other reasons, the presence of financial frictions is typically blamed for this. In view of this reality, it is key for the design of monetary and financial policy to understand the role of macroprudential measures on the transmission of international monetary shocks. In the paper, "[Macroprudential Policy and the Inward Transmission of Monetary Policy: the case of Chile, Mexico, and Russia](#)", Central Bank of Chile economists Tomás Gómez, [Alejandro Jara](#) y [David Moreno](#) jointly with co-authors, [Georgia Bush](#), [Konstantin Styryn](#) Yulia Ushakova use confidential bank data to analyze the interaction between macro-prudential policies and the effects of movements of the United States monetary policy rate on domestic credit.

The study finds evidence that the presence of more stringent macro-prudential policies tones down the transmission of international monetary policy shocks on domestic credit. However, the intensity of such attenuation varies across countries, credit categories and different types of macroprudential measures. The identification strategy exploits the heterogeneity in domestic banks' exposure to the U.S. benchmark interest rate and domestic macroprudential policies implemented in the period studied (2000-2017). This strategy assesses the impact of well-identified shocks to U.S. monetary policy, so it further assumes that the countries considered do not affect such policy decisions. In a first exercise, the exposure to foreign monetary policy corresponds to the fraction of funding that comes from abroad, while the exposure to macro-prudential policies varies depending on the policy considered; for example, foreign currency deposits as a fraction of total assets are considered when assessing the exposure to changes in foreign-currency reserve requirements.

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Among the results, the identification of substitution between domestic and foreign currency credit in Chile stands out: a positive shock to U.S. monetary policy in the presence of tighter foreign-currency reserve requirements induces a reduction in foreign currency credit and an increase in local currency credit. However, this substitution effect is not present in Russia (see Table 1). The study also reveals that macro-prudential policies focused on a particular credit segment, for example, the increase in the cap on the loan-to-value ratio (LTV) for mortgage

loans in Chile, tend to attenuate the transmission of international shocks on the relevant credit segment but not on the others. Finally, the results for Mexico show the potential risk of extrapolating conclusions to all emerging economies. In this case, an unexpected interest rate hike in the United States increases domestic credit. The authors conjecture that this may reflect that such increases contain positive information about the future performance of the U.S., which is particularly linked to the Mexican economy.

Table 1: Macro-prudential policies and substitution between domestic- and foreign-currency credit in the face of monetary policy shocks in the United States*

Ω	Chile		Russia	
	FCD/A LC	FCD/A FC	NRL/TL LC	NRL/TL FC
Loans				
$\sum_{k=0}^K \Omega_{b,t-K-1} \times \Delta MP_{t-k}^{US}$	0.00	-0.00	-0.24**	-0.40***
$\Omega_{b,t-K-1} \times Pru_{t-K-1}^d$	-0.73***	0.43***	-0.04**	-0.03
$\sum_{k=0}^K \Omega_{b,t-K-1} \times Pru_{t-K-1}^d \times \Delta MP_{t-k}^{US}$	0.03***	-0.01***	0.10	0.19***
$\Omega_{b,t-K-1}$	0.00	-0.01	0.00	-0.07
Obs.	782	785	1265	1265
No. of banks	15	15	22	22
R^2	0.54	0.43	0.25	0.21

* The dependent variable corresponds to logarithmic variations in loans to the non-financial private sector, both in local currency (LC) and foreign currency (FC). ΔMP corresponds to the monetary shock in the U.S. The measure of exposure to such shock $\Omega_{(b,t)}$ corresponds to deposits in foreign currency as a percentage of total assets (FCD/A) in the case of Chile, and, in the case of Russia, it is non-residents' liabilities over total liabilities (NRL/TL). The Pru variable increases when domestic macro-prudential policy is stricter. ***, **, and * denote the 1%, 5%, and 10% significance levels, respectively. Quarterly data from 2000Q1 to 2017Q4, for all the banks in the country with foreign exposure.

Publications in academic journals by researchers of the Central Bank of Chile, January-April 2021

Alfaro, R. and A. Sagner “S&P 500 under a Structural Macro-Financial Model” *Economic Analysis Review* (forthcoming)

Arriagada, C., Coble, P., Lewis, B., Li, T. *Post-Investment Aftercare Explained: A Guide for FDI Practitioners and Policymakers on How to Grow and Retain Investors*. Forthcoming. Publisher: Routledge – Taylor & Francis Group. London, UK.

Berstein, S., Morales, M. “The Role of a Longevity Insurance for Defined Contribution Pension Systems”, *Mathematics and Economics*.

Bush, G., T. Gómez, A. Jara, D. Moreno, K. Styrin and Y. Ushakova. “Macroprudential policy and the inward transmission of monetary policy: The case of Chile, Mexico, and Russia,” *Review of International Economics*, vol. 29: 37-60.

Cabezas, L. y A. Jara. “Demanda por circulante: hechos estilizados y sustitución por medios de pago electrónicos” forthcoming, *Revista Cepal*.

Carlomagno, G. and A. Espasa. “Discovering specific common trends in a large set of disaggregates: Statistical procedures, their properties, and an empirical application”, forthcoming, *Oxford Bulletin of Economics and Statistics*.

Carvalho, C., N. Pasca, L. Souza and E. Zilberman. “Macroeconomic Effects of Credit Deepening in Latin America,” forthcoming, *Journal of Money, Credit and Banking*.

Coble, P., Pincheira, P. Forecasting building permits with Google Trends. *Empirical Economics*.

Didier, T., Huneeus, F., Larrain, M., L. Schmukler, S. “Financing firms in hibernation during the COVID-19 pandemic”, *Journal of Financial Stability*, vol. 53.

Fornero, A., F. Gallego, F. Gonzalez y M. Tapia. "Railroads, specialization and population growth in small open economies: evidence from the first globalization", forthcoming, *Journal of Population Economics*.

Garcia-Santana, M., Pijoan-Mas, J., Villacorta, L. “Investment Demand and Structural Change”, forthcoming, *Econometrica*.

Kirchner, M., and M. Rieth. "Sovereign Default Risk, Macroeconomic Fluctuations and Monetary-Fiscal Stabilization", forthcoming, *IMF Economic Review*.

Lu, W., F. Zhiyu Feng and C. Zhu. "Financial Integration, Savings Gluts, and Asset Price Booms," forthcoming, *The B.E. Journal of Theoretical Economics*.

Madeira, C. “The impact of the COVID public policies on the Chilean households”, forthcoming, *Applied Economics Letters*.

Martínez, J. F. y D. Oda “Characterization of the Chilean financial cycle, early warning indicators and implications for macro-prudential policies” *Latin America Journal of Central Banking* (Online Version Available)

Morales-Resendiz, R., J. Ponce, P. Picardo, A. Velasco, B. Chen, L. Sanz, G. Guiborg, B. Segendorff, J. L. Vasquez, J. Arroyo, I. Aguirre, N. Haynes, N. Panton, M. Griffiths, C. Pieterz, and A. Hodge “Implementing a retail CBDC: Lessons learned and key insights” *Latin America Journal of Central Banking*

Paraje, G., Colchero, A., Wlasiuk, J. M., Sota, A. M., & Popkin, B. M. The effects of the Chilean food policy package on aggregate employment and real wages. *Food Policy*, 102016.

Latest working papers of the Central Bank of Chile

Number	Title	Authors	Date
912	Monetary Policy Press Releases: An International Comparison	Mario Gonzalez, Raul Cruz Tadle	Abril 2021
911	The Credit Channel Through the Lens of a Semi-Structural Model	Francisco Arroyo Marioli, Juan Sebastian Becerra, Matias Solorza	Abril 2021
910	Contracts, Firm Dynamics, and Aggregate Productivity	Bernabe Lopez-Martin, David Perez-Reyna	Abril 2021
909	Optimal Spending and Saving Strategies for Commodity-Rich Countries	Alvaro Aguirre	Abril 2021
908	Uncertainty, Risk, and Price-Setting: Evidence from CPI Microdata	Mario Canales, Bernabe Lopez-Martin	Abril 2021
907	Earnings Inequality in Production Networks	Federico Huneus, Kory Kroft, Kevin Lim	Abril 2021
906	Price setting in Chile: Micro evidence from consumer on-line prices during the social outbreak and Covid-19	Jennifer Peña, Elvira Prades	Marzo 2021
905	Economic Growth at Risk: An Application to Chile	Nicolás Álvarez, Antonio Fernandois, Andrés Sagner	Marzo 2021
904	Production, Investment and Wealth Dynamics under Financial Frictions: An Empirical Investigation of the Self-financing Channel	Alvaro Aguirre, Matias Tapia, Lucciano Villacorta	Marzo 2021
903	Earnings Cyclicity of New and Continuing Jobs: The Role of Tenure and Transition Length	Elías Albagli, Gabriela Contreras, Matías Tapia, Juan M. Wlasiuk	Marzo 2021
902	The Internal Labor Markets of Business Groups	Cristobal Huneus, Federico Huneus, Borja Larrain, Mauricio Larrain, Mounu Prem	Marzo 2021
901	A strategic analysis of "Expectations and the neutrality of money"	Gent Bajraj, Neil Wallace	Febrero 2021
900	Forecasting Brazilian Inflation with the Hybrid New Keynesian Phillips Curve: Assessing the Predictive Role of Trading Partners	Carlos Medel	Febrero 2021
899	Searching for the Best Inflation Forecasters within a Consumer Perceptions Survey: Microdata Evidence from Chile	Carlos Medel	Febrero 2021
898	Capital Flows and Emerging Markets Fluctuations	Jorge Lorca	Enero 2021
897	Financial Constraints: a Propagation Mechanism of Foreign Shocks	Rosario Aldunate	Enero 2021
896	Sovereign Default Risk, Macroeconomic Fluctuations and Monetary-Fiscal Stabilization	Markus Kirchner / Malte Rieth	Diciembre 2020

895	Productivity Gaps and Job Flows: Evidence from Censal Microdata	Elías Albagli / Mario Canales / Chad Syverson / Matías Tapia / Juan Wlasiuk	Diciembre 2020
894	The potential impact of financial portability measures on mortgage refinancing: Evidence from Chile	Carlos Madeira	Diciembre 2020
893	Macroprudential Policy and the Inward Transmission of Monetary Policy: the case of Chile, Mexico, and Russia	Georgia Bush / Tomás Gómez / Alejandro Jara / David Moreno / Konstantin Styrin / Yulia Ushakova	Diciembre 2020
892	Labor Earnings Dispersion in Chile: Decomposition, Dynamics and the Role of Firms	Rosario Aldunate / Gabriela Contreras / Matías Tapia	Noviembre 2020