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Regulations, the Supply Side, and Monetary Policy

Remarks by

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Thank you, Madame Ambassador, for the introduction and thank you also to the Delphi Economic Forum for the opportunity to speak today. My topic is the implications of deregulation for monetary policy, an appropriate one for this setting.¹ Greece's recovery from the crisis that began in 2009 was only possible after the Greek people implemented substantial and painful reforms, including alleviating suffocating over-regulation in many sectors. In addition to the other reforms embraced by Greece, deregulation freed businesses to compete domestically and internationally, and promoted individuals' access to the economy. The range of reforms has included liberalizing product and service markets, easing licensing and administrative burdens, opening previously restricted professions, and increasing labor market flexibility. The government liberalized electricity and gas utilities; privatized airports, ports, and utilities; and reformed bankruptcy procedures and other business laws.

While it is challenging to quantify how these deregulatory actions have affected the economy, there is little doubt that these reforms have supported a remarkable return to economic growth and higher living standards. Macroeconomic stability has returned to Greece. Unemployment has fallen to its lowest level since the Global Financial Crisis, and investment and exports have rebounded. Product and labor market reforms helped restore competitiveness, reduce unit labor costs, and encourage firm entry. By easing the ability of supply to respond to prices, these reforms have improved the transmission of monetary policy. While monetary policy is set by the ECB, its transmission varies in part with how national governments manage their economies. Long-term Greek borrowing

¹ The views expressed here are my own and are not necessarily those of my colleagues on the Federal Reserve Board or the Federal Open Market Committee. I am deeply indebted to Casey Mulligan for many conversations about the economics of regulation, but again, the ideas here reflect only my own views.

rates narrowed their spread to Germany's, below 1 percent, compared with 6 percent a decade ago. Greece has come a long way, impressing the whole world with its recovery.

Regulation and the Economy's Supply Side

For all the conversation around Mario Draghi's report,² Greece shows that well-targeted deregulatory reforms can help lay the foundation for more sustained and robust economic growth by expanding the productive capacity of the economy, known as the supply side. Such sustainable increases in actual and potential growth have different implications for monetary policy than purely cyclical growth spurts, which boost growth in the near term without raising economic potential. These jolts can create substantial inflation, undermining growth in the medium term by forcing central banks to raise interest rates, and also in the long term by causing a misallocation of resources.

Recent experiences have reinforced the need for central bankers to fully consider the broad range of nonmonetary factors that could affect the appropriate stance of monetary policy. One such factor that is especially important at this juncture is the regulatory burden borne by businesses and individuals, which has begun to recede in the past year.³ I believe that the sweeping deregulation underway in the United States will significantly boost competition, productivity, and potential growth, allowing faster economic growth without putting upward pressure on inflation. This would support

² Mario Draghi (2024), *The Future of European Competitiveness*, September 9, https://commission.europa.eu/topics/competitiveness/draghi-report_en.

³ In this speech, I am focusing on general economic regulations, not regulations on the banking sector, which are implemented by the Federal Reserve in conjunction with other regulatory agencies. For more on banking regulations, see Stephen I. Miran (2025), "Regulatory Dominance of the Federal Reserve Balance Sheet," speech delivered at the Bank Policy Institute and Small Business & Entrepreneurship Council, Washington, November 19, <https://www.federalreserve.gov/newsevents/speech/miran20251119a.htm>.

continued easing of restrictive monetary policy, but ignoring these effects would result in monetary policy that is needlessly contractionary.

One challenge for central bankers in fully incorporating deregulation into their economic outlooks is that it is difficult to measure in aggregate. Economists are inclined to study things when there are quantitative data to illuminate their work—a version of the famous “lamppost problem” of only looking where the lamppost shines. This may have contributed to a tendency to give short shrift to regulation in judging the economic outlook. Quantitatively measuring regulations is more difficult than taxes, subsidies, or interest rates. Regulations that businesses face can vary enormously based on the sector, size, and sometimes even the age of a company. Some regulations ban activities altogether. Some regulations impose fixed or variable costs for complying. Some regulations affect consumption decisions and some affect production. Regulations can vary enormously across jurisdictions and sometimes within jurisdictions. Additionally, enforcement determines how binding regulations are in practice, and enforcement can be even harder to measure than the effects of regulations themselves.

These measurement challenges are evident in the abundance of economic studies on specific regulations but the much smaller volume of work that tries to comprehensively measure the aggregate effects of the accumulation of regulations on the macroeconomy.⁴ From the perspective of an individual firm, it may be easy to adjust

⁴ For example, lots of papers show very clear implications for productivity and “dynamism” of regulations that inhibit labor adjustment (see Steven J. Davis and John Haltiwanger (2014), “Labor Market Fluidity and Economic Performance,” paper presented at “Re-Evaluating Labor Market Dynamics,” a symposium sponsored by the Federal Reserve Bank of Kansas City, held in Jackson Hole, Wyo., August 22; and David H. Autor, William R. Kerr, and Adriana D. Kugler (2007), “Does Employment Protection Reduce Productivity? Evidence from US States,” *The Economic Journal*, vol. 117 (June), pp. F189–217). For a theory approach, Hopenhayn and Rogerson (1993) is a classic—a tax on firing is a tax on hiring (see Hugo Hopenhayn and Richard Rogerson (1993), “Job Turnover and Policy Evaluation: A General Equilibrium Analysis,” *Journal of Political Economy*, vol. 101 (5). For land use regulation literature, see Leonardo

behavior in response to one regulation, known as a “margin of adjustment,” but compounding regulations can constrain the ability to shift costs by hitting multiple margins of adjustment.⁵ One pebble doesn’t stop a stream, water can flow around it; but enough pebbles will.

A common approach to quantifying the effects of regulations is to count the number of pages of new regulations, though this does not account for varying economic significance across pages. Another approach is to count the number of work hours required to comply, as reported under the Paperwork Reduction Act (PRA). However, there is wide variation in how different regulatory agencies produce these costs estimates, even sometimes variation within agencies, and more importantly, the counting of work hours related to the PRA does not capture the full opportunity cost of the regulations—that is, how that lost hour of work could have been used more productively—or the firms and industries that don’t exist because of the regulation.⁶ If a firm needs to hire a person to comply with some new regulation and can’t hire a sales associate who could generate new business or can’t engage in a productive activity at all, then the foregone opportunity can be significantly larger than the wage for compliance hours.⁷

D’Amico, Edward L. Glaeser, Joseph Gyourko, William R. Kerr, and Giacomo A.M. Ponzetto (2024), “Why Has Construction Productivity Stagnated? The Role of Land-Use Regulation,” NBER Working Paper Series 33188 (Cambridge, Mass.: National Bureau of Economic Research, November), <https://www.nber.org/papers/w33188>.

⁵ For example, a regulation that raises input costs might incent a firm to cut costs by reducing headcount, but the firm may find that response problematic as well because of other regulations.

⁶ For instance, the Small Business Administration and General Services Administration measure PRA paperwork burdens in dollars, whereas other agencies like FinCEN and parts of the Department of Agriculture measure these burdens in hours. Variation within agencies is usually across units, like the Food and Drug Administration relative to the Centers for Medicare & Medicaid Services within the Department of Health and Human Services.

⁷ Standard economics would suggest that, if the compliance associate is seen as a fixed cost but a new salesperson is seen as a variable cost, the optimality condition would ignore the fixed cost and have the firm hire the sales associate anyway. This is well and good for large firms that generate abundant cashflow or have easy access to liquidity, but many smaller firms face more binding cashflow and liquidity constraints and will be unable to hire that salesperson. Moreover, even for large firms, the compliance

There has been some progress in measuring regulation through advances in natural language processing and artificial intelligence, and I expect more of this to come. For instance, Patrick McLaughlin's QuantGov project at Stanford University's Hoover Institution uses computational tools to move beyond regulation page counts toward counting restrictions and obligations imposed by the text and quantifying regulations by industry.⁸ In other work, Joseph Kalmenovitz uses machine learning methods to count and separate regulations that are relevant for a firm's core businesses from those that are not relevant.⁹ These measures show a substantial drop in the number of rules in 2025.¹⁰

Among other deregulatory efforts is the current U.S. Administration's "one-in-ten-out policy" revoking 10 old regulations for every new one adopted.¹¹ Based on the pace of the Administration's deregulatory efforts in the first part of 2025, I estimate that 30 percent of the regulatory restrictions in the Code of Federal Regulations will be eliminated by 2030, though this may prove an underestimate.¹²

associate may be a variable cost for expanding an existing line of business, or he or she may be a fixed cost that impedes the firm's expansion into a new line of business or market. See the discussion that follows of "markup regulations" and competition.

⁸ Quantgov (2025), "What is Quantgov," webpage, <https://www.quantgov.org/about>.

⁹ Joseph Kalmenovitz (2023), "Regulatory Intensity and Firm-Specific Exposure," *The Review of Financial Studies*, vol. 36 (August), pp. 3311–47.

¹⁰ See footnote 12 for McLaughlin's analysis. Kalmenovitz's analysis is available on his website, <https://www.jkalmenovitz.com/>, accessed January 5, 2025.

¹¹ Executive Office of the President (2025), "Unleashing Prosperity Through Deregulation, Executive Order 14192," *Federal Register*, vol. 90 (February 6), pp.9065–67.

¹² McLaughlin (2025) estimates 2,404 deregulatory actions from the Spring 2025 Unified Agenda of Regulatory and Deregulatory Actions. If the average deregulatory action removes 25.6 restrictions from the CFR, which was the average through July 1 of this year, then 61,542 restrictions will be removed per year. Five years at this rate will remove 28 percent of a total of 1.1 million restrictions. I rounded up to 30 percent because I expect the pace of deregulation to accelerate with the accelerated pace of Senate confirmations due to the Senate's recent adoption of *en bloc* confirmation; with more personnel, deregulation will be much quicker than it was in the first few months of a fresh administration. Indeed, I think 30 percent will ultimately prove to be an underestimate. As McLaughlin notes, we will soon get the Fall 2025 Unified Agenda, which will allow me to update this calculation. I used McLaughlin's analysis rather than Kalmenovitz's for this exercise because, as of January 5, Kalmenovitz's measure showed a nearly 25 percent reduction in overall federal regulatory burden over the course of 2025, and as optimistic as I am regarding the coming deregulatory trend, that magnitude seems aggressive to me at present. Moreover, Kalmenovitz's measure is prone to revision. See Patrick McLaughlin (2025), "Early Data on

Regulations can have far larger consequences for the supply side than, for example, taxes, because they can amount to outright prohibitions and thus function as infinite taxes. Quantity controls are usually far more damaging than those that directly affect prices.¹³ Consider agglomeration, when a group of firms in the same general industry benefit from proximity, such as R&D labs and production plants, or clients and customers. An auto parts producer benefits from being close to an automaker.

Environmental or other restrictions that restrict co-location can affect the entire economy's supply side by preventing the agglomeration necessary for an industry to be profitable. Take one piece of an industrial ecosystem away because of a regulation and the rest become harder to sustain. Supply chain ecosystems exist—or don't—because of regulations determining what activity can take place and where. I think it is hard to argue that, say, the excess burden of going from a 30 percent to a 33 percent marginal tax rate has the same effect as a regulation preventing an entire industry from existing domestically. Regulations, particularly those that affect physical production, can force the economy from high-productivity sectors to low-productivity sectors by encouraging capital-intensive production to move to less regulated places, such as China.

Research on the effects of regulation on the supply side of the economy has developed along two major lines of inquiry. The first studies regulation's effect on total factor productivity (TFP) and growth by making production more expensive.¹⁴ If

Deregulatory Push in Washington,” Third Order, October 28, <https://thirdorder.substack.com/p/early-data-on-the-deregulatory-push>.

¹³ Discussion of conditions for the social optimality of taxes over regulations can be found in Alberto Alesina and Francesco Passarelli (2014), “Regulation Versus Taxation,” *Journal of Public Economics*, vol. 110, pp. 147–56.

¹⁴ The effects of regulation on TFP were one point I made in my first speech as a Federal Reserve Board member; see Stephen I. Miran (2025) “Nonmonetary Forces and Appropriate Monetary Policy,” speech delivered at the Economic Club of New York, New York, September 22, <https://www.federalreserve.gov/newsevents/speech/miran20250922a.htm>.

regulations make, say, electricity or manufactured goods more expensive to produce, they lower TFP.¹⁵ Regulations can also distort investment decisions across sectors or impede innovation, leading to an economy-wide misallocation of resources with commensurate effects on aggregate productivity levels.¹⁶

An alternative way of modeling regulation is via its effects on free entry and markups. Regulatory costs that appear marginal from an industry perspective often originate as fixed costs from a firm perspective. An existing homebuilder building one more house may be marginal, but for a new entrant to build it, they would have to invest in vast compliance infrastructure. In many jurisdictions, they'd have to learn how to measure carbon emissions, decipher labor regulations, pass various inspections at different stages, and pay other fixed costs. The barriers to building a house have become so burdensome that many builders exit entire markets, leaving numerous large metro areas without desperately needed supply. As such, regulations often serve as barriers to entry, with all the attendant consequences: reduced competition, artificially high returns to scale, higher markups, reduced innovation, and reduced productivity growth. Let's call these "markup regulations."¹⁷

There is abundant evidence both within and across countries that increased regulation causes reduced firm entry, decreased competition, and lower investment, all

¹⁵ For evidence of the relationship between regulation and TFP, see John W. Dawson and John J. Seater (2013), "Federal Regulation and Aggregate Economic Growth," *Journal of Economic Growth*, vol. 18 (June), pp. 137–77. For a rigorous theoretical model of productivity enhancements in a Schumpeterian model, see Bentley Coffey, Patrick A. McLaughlin, Pietro Peretto (2020), "The Cumulative Cost of Regulations," *Review of Economic Dynamics*, vol. 38 (October), pp. 1–21.

¹⁶ Alberto Alesina, Michele Battisti, and Joseph Zeira (2018), "Technology and Labor Regulations: Theory and Evidence," *Journal of Economic Growth*, vol. 23 (March), pp. 41–78.

¹⁷ Of course, antitrust regulations are designed to increase and not decrease competition; but these are a small portion of the overall regulatory code, and I am focused here on regulations outside of antitrust.

consistent with elevated fixed costs.¹⁸ Decreased firm entry, competition, and innovation lead to a malaise familiar to many: Formerly dynamic industries calcify, flagship businesses choose to move elsewhere or shutter completely, and communities feel cheated out of their way of life.

Implications for Monetary Policy

Now let me discuss the implications of regulation and deregulation for monetary policy. Most theory and research suggest that increasing the regulatory burden reduces productivity and thus puts upward pressure on prices. This is intuitive: Regulations impede production, and deregulation removes those impediments. More production means lower prices, and vice versa. But gauging the magnitudes of these effects is more difficult.

Work by Dustin Chambers, Courtney A. Collins, and Alan Krause found that a 1 percent increase in U.S. federal regulations in a particular industry is associated with a roughly 10 basis point increase in consumer prices in that industry, and that is only in the near term.¹⁹ Longer-term effects and effects from more substantial changes in regulations are, in my view, likely to be substantially larger, since firm entry and the effects of increased competition develop over time. Supply chain ecosystems can take

¹⁸ Alberto Alesina, Silvia Ardagna, Giuseppe Nicoletti, and Fabio Schiantarelli (2005), “Regulation and Investment,” *Journal of the European Economic Association*, vol. 3 (4), pp. 791–825; James B. Bailey and Diana W. Thomas (2017), “Regulating Away Competition: The Effect of Regulation on Entrepreneurship and Employment,” *Journal of Regulatory Economics*, vol. 52, pp. 237–54; Germán Gutiérrez and Thomas Philippon (2017), “Declining Competition and Investment in the U.S.,” NBER Working Paper Series 23583 (Cambridge, Mass.: National Bureau of Economic Research, July), <https://www.nber.org/papers/w23583>; and Dustin Chambers, Patrick A. McLaughlin, and Tyler Richards (2022), “Regulation, Entrepreneurship, and Firm Size,” *Journal of Regulatory Economics*, vol. 61, pp. 108–34.

¹⁹ Dustin Chambers, Courtney A. Collins, and Alan Krause (2017), “How Do Federal Regulations Affect Consumer Prices? An Analysis of the Regressive Effects of Regulation,” *Public Choice*, vol. 180, pp. 57–90.

years to rise or fall. I'd also expect cross-industry spillovers to boost aggregate effects above this level. But even these modest within-industry, short-term effects would be substantial in the context of the potential 30 percent decline in the regulatory code that I projected earlier. This implies a cumulative drag of roughly 3 percent on the consumer price level through 2030, a little over half a percent per year.²⁰

What happens in the short term depends on various factors—the types of regulations involved, the way these regulations affect firms and households, and the manner of enforcement. On balance, I believe the substantial deregulation that has occurred in 2025 will continue over at least the next three years and be a large positive shock to productivity that will put downward pressure on prices. On net, this supports a more accommodative stance of monetary policy.

As I have argued, I think the primary effects of deregulation are on the supply side of the economy and have the effect of increasing potential output more than they increase actual output. For example, if the number of goods I can produce is effectively limited by regulation, and that cap is removed, this means I can produce more. If demand increases and production is limited by regulation or some other factor, then prices increase. If demand rises and these shackles have been removed, then output grows and pressure on prices is much smaller.

While I think of regulation as primarily a supply-side factor, it can also affect demand. For instance, the news of planned deregulatory action can stimulate investment now for future production, increasing aggregate demand and prices in the short run, before prices adjust to the lower level that would prevail over the longer run. However, I

²⁰ Of course, this predicted decline is relative to what consumer prices would have done in the absence of the deregulatory actions and not a prediction about an absolute change.

see little reason to expect the short-run effect on demand will exceed potential. In my earlier speech, I assumed that deregulation immediately increases actual output half as much as potential output, and then the two converge over a few years. While some approaches assume TFP shocks increase actual and potential output by the same amount, work by Olivier Coibion, Yuriy Gorodnichenko, and Mauricio Ulate shows that a structural approach to modeling the supply-side results in potential output overshooting actual output in response to a TFP shock.²¹

Of course, this matters because the output gap is a primary input into calculating the appropriate setting for monetary policy. If actual output falls below potential output, there is slack in the economy that could be accommodated by looser monetary policy. If deregulation boosts potential output above actual, the correct response is to cut rates. At the same time, by increasing the marginal product of capital, deregulation may raise the so-called neutral rate of interest at which monetary policy is neither accommodative nor

²¹ See Olivier Coibion, Yuriy Gorodnichenko, and Mauricio Ulate (2018), “The Cyclical Sensitivity in Estimates of Potential Output,” Brookings Paper on Economic Activity, Fall, pp. 343–441 https://www.brookings.edu/wp-content/uploads/2018/09/Coibion-et-al_final-draft.pdf. Coibion et al. show that in a Blanchard-Quah (BQ) approach to estimating potential output, TFP shocks increase potential output much more rapidly than actual output (figure 12). The BQ approach relies on the uncontroversial theoretical assumption that supply-side shocks affecting potential output are those which have permanent effects on the level of output while demand shocks are restricted to having no permanent effects. It provides a more structural economic grounding for estimating potential output than various filter-based approaches.

The case for actual and potential output moving up the same amount in response to a TFP shock seems more plausible if the TFP shock is driven by a new technology, which requires investment to implement. But not all TFP shocks are the same, and regulations are quite different. If today a regulation limits the amount of carbon a factory can emit, but tomorrow the factory can emit more carbon, it does not require the same amount of new investment as would be required to, say, implement new computer technologies. Letting an existing smokestack run for 24 instead of 8 hours is quite different from having to buy graphical processing units to develop a large language model. In other words, it may be appropriate to consider regulatory TFP shocks as having different consequences for output gaps than technological TFP shocks have. See also Boivin, Kiley, and Mishkin (2011), who observe that the response of actual output to a TFP shock depends crucially on the monetary response, underlining that it is crucial for the Fed to stay abreast of TFP shocks in formulating the appropriate stance of policy (Jean Boivin, Michael Kiley, and Frederic Mishkin (2011), “How Has the Monetary Transmission Mechanism Evolved Over Time?” in Benjamin M. Friedman and Michael Woodford, eds., *Handbook of Monetary Economics*, Vol. 3. (Amsterdam: Elsevier), pp. 369–422).

restrictive. I addressed this in my first speech as a member of the Federal Reserve Board.²²

Turning to markups, the second channel for the effects of regulation on the supply side, models indicate that if monetary policy ignores the deflationary effects of deregulation, then we risk causing an unnecessary contraction in the economy. That is the implication of an important 2014 paper by Gauti Eggertsson, Andrea Ferrero, and Andrea Raffo, which models deregulation as a reduction in markups—increased competition—in a standard New Keynesian model.²³ They find that the appropriate response of monetary policy is to reduce interest rates in response to this type of deregulation shock and offset its consequent deflation. If for some reason monetary policy fails to do so, then deflation and economic contraction needlessly result. This model implies that, if the Federal Reserve fails to reduce policy rates in response to deregulation, there will be adverse consequences. Greece’s experience testifies to this. Had the ECB not implemented exceptionally loose monetary policy and effectively accommodated Greece’s structural reforms, the outcome could have been quite different.

I believe that central bankers should be paying close attention to the effects of regulation on productivity, output, and prices. In recent quarters, policy has been tighter than it should have been to reflect significant deregulation lifting potential growth and reducing inflation. Going forward, I expect that the ambitious deregulation underway in the United States will boost growth without boosting inflation and be one factor

²² In that speech, I included a boost to neutral rates from deregulation (which was offset by reductions in neutral rates from other sources like reduced population growth and smaller fiscal deficits). I also included a wider output gap because of potential growth increasing faster than actual growth as a result of deregulation. In that speech, I did *not* model an explicit deregulation-driven reduction in prices, either from a TFP boost or a reduction in markups, an oversight partially addressed here.

²³ Gauti Eggertsson, Andrea Ferrero, and Andrea Raffo (2014), “Can Structural Reforms Help Europe?” *Journal of Monetary Economics*, vol. 61, pp. 2–22.

supporting a further easing of monetary policy. In this regard, Greece and the ECB have lit the path. I have raised this point with my Federal Open Market Committee colleagues and expect to continue to do so in our deliberations.