Growth Potential and Macroeconomic Policy: 
What Reforms? When? And What Role for Macro Policy?

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What Reforms?

The figures and slides in this part of the presentation are borrowed from the following sources:
startup businesses at historically low rates.

The American economy has long relied on fast-growing young companies to fuel job growth and spread the latest innovations. As recently as the 1980s and 1990s, a small number of young firms disproportionately contributed to U.S. employment growth, helping allocate workers and resources to burgeoning segments of the economy.

But government data shows a decadeslong slowdown in entrepreneurship. The share of private firms less than a year old has dropped from more than 12% during much of the 1980s to only about 8% since 2010. In 2014, the most recent year of data, the startup rate was the second-lowest on record, after 2010, according to Census Bureau figures released last month, so there’s little sign of a postrecession rebound.

The share of employment at such firms, meanwhile, has slipped from nearly 4% to about 2% of private-sector jobs.

While only a few percentage points, the drop translates into hundreds of thousands of companies and jobs. If the U.S. were creating new firms at the same rate as in the 1980s, that would be the equivalent of more than 200,000 companies and 1.8 million jobs a year.
TOP REFORMERS AND LAGGARDS IN IMPROVING BUSINESS ENVIRONMENT SINCE 2005

<table>
<thead>
<tr>
<th>Rank</th>
<th>Reformers</th>
<th>Laggards</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Rwanda</td>
<td>United States</td>
</tr>
<tr>
<td>2</td>
<td>Georgia</td>
<td>Malta</td>
</tr>
<tr>
<td>3</td>
<td>Macedonia (former Yugoslav Republic)</td>
<td>Antigua</td>
</tr>
<tr>
<td>4</td>
<td>Belarus</td>
<td>Equatorial Guinea</td>
</tr>
<tr>
<td>5</td>
<td>Colombia</td>
<td>Maldives</td>
</tr>
<tr>
<td>6</td>
<td>Poland</td>
<td>Micronesia</td>
</tr>
<tr>
<td>7</td>
<td>Armenia</td>
<td>St. Lucia</td>
</tr>
<tr>
<td>8</td>
<td>Vietnam</td>
<td>Belize</td>
</tr>
<tr>
<td>9</td>
<td>Portugal</td>
<td>Bolivia</td>
</tr>
<tr>
<td>10</td>
<td>Russia</td>
<td>Luxembourg</td>
</tr>
<tr>
<td>11</td>
<td>Kazakhstan</td>
<td>Papua New Guinea</td>
</tr>
<tr>
<td>12</td>
<td>Ukraine</td>
<td>San Marino</td>
</tr>
<tr>
<td>13</td>
<td>Croatia</td>
<td>Dominica</td>
</tr>
<tr>
<td>14</td>
<td>Romania</td>
<td>Eritrea</td>
</tr>
<tr>
<td>15</td>
<td>Latvia</td>
<td>Marshall Islands</td>
</tr>
<tr>
<td>16</td>
<td>Lithuania</td>
<td>Barbados</td>
</tr>
<tr>
<td>17</td>
<td>Czech Republic</td>
<td>Iraq</td>
</tr>
<tr>
<td>18</td>
<td>Azerbaijan</td>
<td>Kiribati</td>
</tr>
<tr>
<td>19</td>
<td>Mauritius</td>
<td>Libya</td>
</tr>
<tr>
<td>20</td>
<td>Moldova</td>
<td>South Sudan</td>
</tr>
</tbody>
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Sources: World Bank's Doing Business reports (2005-17); author’s calculations.

A benign explanation could be that the United States is simply such a hospitable place to do business that there is little need for improvement—and improvements are mostly needed in countries that play catch up with more competitive economies. Indeed, 17 of the top 20 reformers are former communist countries. Such countries had to make tremendous changes to their laws and regulations to move from central planning to market economies. Not surprisingly, they are among the fastest reformers.

Rwanda, Portugal, and Mauritius are the three economies in the top 20 reform list without a communist past. Each, however, has a compelling story on the urgency of business reforms. In the first instance, this urgency is the result of a consistent reform effort by President Paul Kagame’s government to develop Rwanda as a middle-income country by 2020. Portugal started rapidly improving its business environment only after the eurozone crisis, when unemployment soared and young people started leaving the country in droves. Greece, Spain,
Gabaix (2011) shows that aggregate volatility due to the idiosyncratic shocks to firms is an increasing function of the Herfindahl index of the firms’ output shares. To produce the country size-volatility relationship in figure 1 through the shocks to large firms, it must be the case that smaller countries have higher Herfindahl indices of firm output: they are less diversified. Figure 3A presents the partial correlations between the Herfindahl index of firm sales and country size, after netting out the impact of per capita income, with all variables in natural logs. The figure also plots the ordinary least squares best fit through the data, along with the slope coefficients, standard errors, and the $R^2$’s. The firm-level data used to compute the Herfindahl indices come from the ORBIS database described in Appendix A. Because the number of firms covered by ORBIS varies substantially across countries, we present the results for three samples: (i) all 134 countries for which it is possible to calculate the Herfindahl index in ORBIS data, (ii) the 81 countries with sales data for at least 100 firms, and (iii) the 52 countries with sales data for at least

\[ h = \sum h(k)^2, \text{ where } k \text{ indexes firms, and } h(k) \text{ is the share of firm } k \text{ in total sales by all firms.} \]
Majority of firms are small

Fig 3 Firm Size by Number of Workers (2014)
High Turnover Rates

Fig 4 Exit rate for the first 5 years (2013, %)

![Bar chart showing exit rates for the first 5 years (2013, %) for different sectors: Retail, Restaurant and Lodging, and Real Estate and Leasing.](chart.png)
## Composition of Entry and Exit

<table>
<thead>
<tr>
<th>Industry</th>
<th>Entry (%)</th>
<th>Exit (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Restaurant and lodging</td>
<td>20.1</td>
<td>21.7</td>
</tr>
<tr>
<td>Retail</td>
<td>17.3</td>
<td>19.4</td>
</tr>
<tr>
<td>Real estate and leasing</td>
<td>16.1</td>
<td>16.5</td>
</tr>
<tr>
<td><strong>Sum</strong></td>
<td><strong>53.5</strong></td>
<td><strong>57.6</strong></td>
</tr>
</tbody>
</table>

*Table 1* Composition of entry and exit (2012)
Self-Employment Dynamics in Korea

- Majority of businesses are small (1-4 workers)
  - More than 80% of businesses

- Concentration of firms in a few industries
  - Three sectors (restaurant and lodging, retail, and real estate) consisting more than half of total entry and exit
  - Per 1,000 people, Korea has 13.5 restaurants and lodging - much higher than Japan (5.6) or the US (2.1)

- Higher turnover rate of firms in these industries
  - Up to 45% of firms in these sectors do not last a year
Different from the U.S.

- In contrast to the small businesses in the U.S., Korea shows a high rate of subsistence business
  - 80% of the self-employed replied that they became entrants because they could not get a job elsewhere
  - 68.7% replied that age was a barrier when finding a job
When?

Figure 1. Home product market reform, normal times (continuous lines) versus recession (dashed lines). Responses show percentage deviations from the initial steady state. Unemployment is in deviations from the initial steady state.
Figure 2. Home firing costs reform, normal times (continuous lines) versus recession (dashed lines). Responses show percentage deviations from the initial steady state. Unemployment is in deviations from the initial steady state.
Figure 8. Home product market reform in a recession, open capital account (continuous lines) versus financial autarky (dashed lines). Responses show percentage deviations from the initial steady state. Unemployment is in deviations from the initial steady state.
And What Role for Macro Policy?

The figures in this part of the presentation are from the following papers:
of $\Sigma_{PC}$, happens because the short-run increase in inflation reduces the incentive of prospective entrants to take advantage of lower non-technological barriers to entry.\footnote{Bilibie et al. (2008b) and Chugh and Ghironi (2015) show that it is optimal to tax entry in the benchmark BGM model with translog preferences. However, this does not imply that a reduction in entry should reduce the inefficiency wedge in product creation in our scenario of multiple distortions and a non-optimized change in entry barriers.}

Employment, GDP, and consumption in the Foreign, rigid economy are also favorably affected by the Ramsey policy on impact due to the larger demand for Foreign goods in the deregulating economy. The optimal policy reduces the job creation wedge during the transition also in Foreign. The product creation wedge falls on impact, but then increases, associated with lower product creation in the relatively less attractive business environment during much of the transition. Finally, notice that both Home and Foreign benefit from improved risk-sharing under the Ramsey-optimal policy, i.e., the inefficiency wedge $\Sigma_{RS}$ is reduced at each point in time relative to the historical policy.

As time passes, the differences between Ramsey policy and historical rule vanish, at least in the deregulating economy. In the long run, Home deregulation reduces (or leaves virtually unaffected) all Home and Foreign inefficiency wedges with the exception of cross-country risk-sharing. The optimal long-run inflation target remains positive but is smaller than under high regulation.

To understand this result, it is useful to inspect how deregulation affects inefficiency wedges in the long run. First, recall that the markup is constant in steady state, implying $T_m = 0$. Moreover, under the assumption of long-run zero net inflation, $T_{m*} = T_{m*} = 0$, and the Hosios condition implied by our calibration of the initial, historical position ensures that $\eta_{m*} = \eta* = \epsilon*$, so that $T_{c*} = 0$. Finally, product market regulation does not change the value of unemployment benefits, leaving $T_{l*}$ unaffected. The zero-inflation steady state features two additional distortions that are affected by regulation and inflation: the misalignment between the consumers' benefit from variety and the profit incentives for new entrants, $T_{v*} = (\mu - 1) - 1/(2\alpha N)$, and the monopoly power distortion in labor supply and job creation, $T_c = (1/\mu) - 1$.\footnote{Notice that a long-run widening of $\Sigma_{PC}$ relative to the initial level of 1 does not imply that there is a larger incomplete markets distortion in the new steady state (which features zero net foreign assets like the initial one). Asymmetric deregulation introduces a long-run structural asymmetry between Home and Foreign. This implies that the risk sharing wedge around the new steady state should be redefined as $\Sigma_{PC}/(\Sigma_{PC} + \Sigma_{JC}(\eta_* - \eta_{m*}))/\Sigma_{PC}$, where $\kappa$ reflects the effect of the long-run asymmetry between the two economies. But the new, post-deregulation steady state remains efficient along the risk sharing margin because of the absence of any uncertainty in steady state.}

As barriers to entry fall, the steady-state number of products in the economy increases. With zero net inflation, the fall in markups due to higher substitutability is larger than the reduction in the consumers' incremental benefit from variety, since $\partial T_{v*}/\partial N = -1/(2\alpha N^2) < 0$. It follows that lower regulatory costs reduce the misalignment between benefit from variety and incentives for product creation. Moreover, the reduction in markups also reduces the distortion $T_{m*}$, since $\partial T_{m*}/\partial N = -1/(\alpha N^2) < 0$. Intermediate input producers have stronger incentives to post vacancies, households have stronger
product lines that are sold only domestically ($\tilde{z}_d$, which is constant by construction), and of the average productivity for export production ($\tilde{z}_e$; this is the average productivity of the export operation of product lines sold both domestically and abroad). We then exploit linearity of production of differentiated varieties in the non-traded intermediate input, and linearity of production of the latter in labor, to plot (in the second row of each b-figure) the responses of implicit employment in the average production line, $y_{t}(\tilde{z}_t) = \tilde{Z}_t(\tilde{z}_t)/C_{17}y_{t}$, employment in the average product variety line that is sold only domestically, $y_{d}(\tilde{z}_d) = \tilde{Z}_t(\tilde{z}_d)/C_{17}y_{d}$, and employment in the average export operation of traded varieties, $y_{e}(\tilde{z}_e) = \tilde{Z}_t(\tilde{z}_e)/C_{0}/C_{17}$. These are implicit measures of employment in production of the differentiated varieties, as our model assumes that labor is used in production of the intermediate input. However, linearity of the production process from labor to final varieties makes it possible for us to characterize transparently the use of labor in variety production, and thus analyze the resource reallocation effects discussed by policymakers in the context of our model. (The bottom two rows in each b-figure show the same variables for the Foreign country, to investigate the external resource allocation consequences of Home market reforms.)
Finally, we address the welfare consequences of reforms in Tables 3 and 4. All welfare results are in percentage of steady-state consumption. Table 3 presents the changes in welfare directly implied by Home reforms under historical policy and the Ramsey-optimal policy. Table 4 presents the effects of Home reforms on the welfare costs of business cycles.

5.1. Optimal policy in the status quo

As Table 3 shows, moving from historical policy to the Ramsey-optimal, cooperative policy increases welfare by 0.54 percent of steady-state consumption at Home and 0.27 percent in Foreign under the regulation status quo. The Ramsey-optimal policy implies a higher inflation rate in the Home country than in Foreign. (In steady state, consumer and producer price inflation rates coincide, so we simply refer to inflation when talking about the long-run status quo.) This can be understood with reference to the distortions we discussed above: A long-run equilibrium with constant endogenous variables eliminates some of these distortions: A constant markup removes the markup variation distortion from the product creation margin; constant consumption removes the risk-sharing distortion of incomplete markets, and constant, zero net foreign assets eliminate the effect of asset adjustment costs. Monopoly power of firms in the downstream sector, positive unemployment benefits, and a departure from the Hosios condition in Home imply suboptimally low job-creation. Since $\pi_C = \pi_d = \pi_w$, positive inflation raises firm bargaining power $\eta_w$, favoring vacancy posting by firms. The intuition for the positive relation between inflation and $\eta_w$ is straightforward: Positive inflation is costly for firms, who bear the costs of wage adjustment. Suppose we want a firm to hire the same amount of labor in an environment of positive inflation as it would with zero inflation. For the firm to be willing to do that with positive wage adjustment costs, it must be compensated by the willingness of workers to accept a lower level of the bargained wage. For this to happen, the bargaining power of firms must rise.

Importantly, the result of a positive Ramsey inflation target is not an “automatic” consequence of assuming a form of nominal rigidity that implies long-run non-neutrality of money. As shown in Bilbiie et al. (2014), the same form of price stickiness implies a zero Ramsey-optimal inflation target in the sticky-price model of Bilbiie et al. (2008a)—regardless of labor supply elasticity—if preferences take the C.E.S. Dixit–Stiglitz (1977) form that is common in the New Keynesian literature. The reason is that continuous C.E.S. Dixit–Stiglitz preferences imply a perfect balancing of monopoly profit incentives for product creation and the welfare benefit of product variety to consumers in the flexible-price equilibrium of the model. In this case, the Ramsey policymaker refrains from using positive average inflation to address the effect of...
Extras

The figures in this part of the presentation are from the following papers:
Figure 3. Home unemployment benefits reform, normal times (continuous lines) versus recession (dashed lines). Responses show percentage deviations from the initial steady state. Unemployment is in deviations from the initial steady state.
in Fig. 1, an increase in Home productivity generates Foreign expansion through trade linkages, as demand-side complementarities more than offset the effect of resource shifting to the more productive economy. (This is true also with higher shock persistence than for the example of Fig. 1.) Moreover, absent technology spillovers, Foreign consumers have weaker incentives to increase consumption on impact, which reduces the cross-country consumption correlation.44

5. Market reforms and monetary policy in the international economy

Having established that the model successfully reproduces (qualitatively and/or quantitatively) several features of the international business cycle, we turn to our main exercise and study the domestic and international consequences of market reforms in one of the countries in our model, and how such reforms affect the conduct of optimal monetary policy.

We calibrated both countries in the model to U.S. targets to assess the model’s properties. A goal of our exercise in this paper is to begin shedding light on how market reforms in Europe are likely to affect transatlantic interdependence and policy incentives for the Federal Reserve and the ECB. For this purpose, we isolate structural conditions of product and labor markets as the only source of asymmetry between the euro area and the U.S. in our model. We accomplish this by recalibrating the parameters that capture Home market regulation (the entry cost in product markets, \(f_e\); unemployment benefits, \(b\); and the flexible-wage bargaining power of workers, \(1-\eta\)), taken as a measure of employment protection) to European levels (see the Appendix for details).45 This adjustment in parameter values allows us to treat the Home country as a model-euro area that differs from the U.S. only by featuring more rigid product and labor markets, and to isolate the consequences of this asymmetry and of reforms that align European market characteristics to U.S. levels.

Under the new calibration, we compute the welfare benefit of moving from the historical policy behavior of the calibration in Table 1 to the Ramsey-optimal cooperative monetary policy, as well as the cooperative, Ramsey-optimal, long-run inflation rates in the two countries. These results are reported in Table 3, in the “Status quo” row. We then compute impulse responses to Home product market reform (Fig. 2), Home labor market reform (Fig. 3), and joint reform of both Home markets (Fig. 4). Each Home market reform brings the relevant parameter value(s) to the flexible (U.S.) level used in the previous section. The parameter change is treated as a permanent shock, and the impulse responses trace the domestic and international effects of this change from the impact period to the long run, under historical policy or the cooperative, Ramsey-optimal policy.46

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44 The very low correlation of consumption across countries in Table 2 is due to the combination of incomplete markets, bond adjustment costs (albeit small), and extremely persistent shocks. Reducing shock persistence facilitates risk sharing and increases consumption correlation, consistent with results in Baxter and Crucini (1995).

45 For our purposes, changing directly the value of \(f_e\) is sufficient to capture changes in product market regulation. The underlying assumption is that the change comes from a change in the “red tape” portion \(f_e\) of the overall entry cost rather than in the technological requirement \(f_T\).

46 In the Ramsey policy problem for this exercise, we assume that the initial conditions are given by the rigid steady state under the historical policy (which features zero inflation). In technical terms, we solve for the Ramsey-optimal policy in response to market deregulation assuming time-zero commitment to the optimal plan. An alternative approach would be to solve for the optimal response to reform assuming that the initial conditions are given by the optimal Ramsey steady state with high product and labor market regulation, i.e., from a timeless perspective. Our choice has the advantage of making the comparison between historical and Ramsey-optimal policy more transparent. (In the presence of different initial conditions associated to...
Since much of the policy debate on the benefits of market reforms focuses on the benefits they would generate by reallocating resources to more efficient uses, for each reform, we also present figures that make it possible to study such reallocation effects. Specifically, part b of Figs. 2–4 shows the responses of three measures of productivity and employment across different uses of resources in production. In our model economy, it is possible to define the productivity of the average Home product-variety line, whose output is sold both domestically and abroad, as

$$
\tilde{z}_t = \left\{ \frac{\rho_{d} - 1}{\tau} + \left( \frac{\tilde{z}_t x_t}{N_{x_t}} \right)^{\theta - 1} \right\}^{1/(\theta - 1)}.
$$

(28)

The first row of each b-figure shows the responses to reform of this average productivity, of the average productivity of alternative monetary policy regimes, as implied by the alternative approach, it would be impossible to isolate the role of monetary policy for the transition dynamics following reforms.)

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Fig. 2. (b) Home product market deregulation, productivity and labor reallocation effects.

Fig. 3. (a) Home labor market deregulation, flexible regulation in Foreign. Historical policy (solid) versus optimal policy (dashes).
Since much of the policy debate on the benefits of market reforms focuses on the benefits they would generate by reallocating resources to more efficient uses, for each reform, we also present figures that make it possible to study such reallocation effects. Specifically, part b of Figs. 2–4 shows the responses of three measures of productivity and employment across different uses of resources in production. In our model economy, it is possible to define the productivity of the average Home product-variety line, whose output is sold both domestically and abroad, as

\[
\bar{z}_t = \left\{ \frac{\mu^*}{\bar{z}_{d}^{\tau}} + \left( \frac{\bar{z}_{d}^{\tau}}{\tau} + \frac{\mu^*}{\bar{z}_{d}^{\tau}} \right) \frac{N_{x,t}}{N_{d,t}} \right\}^{1/(\eta - 1)} .
\]

The first row of each b-figure shows the responses to reform of this average productivity, of the average productivity of (footnote continued) alternative monetary policy regimes, as implied by the alternative approach, it would be impossible to isolate the role of monetary policy for the transition dynamics following reforms.)
product lines that are sold only domestically ($z_d$, which is constant by construction), and of the average productivity for export production ($z_x$, this is the average productivity of the export operation of product lines sold both domestically and abroad). We then exploit linearity of production of differentiated varieties in the non-traded intermediate input, and linearity of production of the latter in labor, to plot (in the second row of each b-figure) the responses of implicit employment in the average production line, $\gamma_t(z_t) = \frac{Z_t}{Z_t}$, employment in the average product variety line that is sold only domestically, $\gamma_d(z_d) = \frac{Z_d}{Z_d}$, and employment in the average export operation of traded varieties, $\gamma_x(z_x) = \frac{Z_x}{Z_x}$. These are implicit measures of employment in production of the differentiated varieties, as our model assumes that labor is used in production of the intermediate input. However, linearity of the production process from labor to final varieties makes it possible for us to characterize transparently the use of labor in variety production, and thus analyze the resource reallocation effects discussed by policymakers in the context of our model. (The bottom two rows in each b-figure show the same variables for the Foreign country, to investigate the external resource allocation consequences of Home market reforms.)